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Keeping One Foot on the Ground

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Already recovering from the trials of 2021, the potato industry is looking confidently towards the year that has just begun. Although many expect to register growth at the end of the next 12 months, they also acknowledge that nothing is certain and that the way out of this crisis may still be out of sight. 2021 has put the potato industry on a roller coaster whose race does not seem to have ended yet. It is clear that it was a difficult time for all the players, but the power of adaptation has had its say, and their business partnerships have mattered more than ever in the growth equation. Although it was far from what anyone had imagined, the whole industry made every effort to keep the business within normal parameters. Whether we're talking about adapting business strategies, changing priorities or investing prudently, 2021 was an exercise in maturity and solidarity. When it comes to the future, industry executives are optimistic and hope for a better 2022, in which the market will

Whether we're talking about adapting business strategies, changing priorities or investing prudently, 2021 was an exercise in maturity and solidarity.

fully recover and innovation will once again have a say. 2022 brings what was largely missing before: a time perspective. We can look at things knowing that the return to normal is coming. Not in absolute terms, of course, because certain trends or consumer behaviors have definitely changed. Optimism is perhaps the best medicine, especially when it comes to the economic evolution or financial situation of a company. The lessons so far have been useful, albeit brutal in some places, and will serve as scenarios for the current year, but adapting to the unexpected is what will make the difference in the short term. Circumstances may not have allowed us to be as open to each other as we normally would have been. However, I am optimistic that this will change in 2022, and we will once again be able to network, reconnect, and learn about the latest services and technologies during the industry's dedicated trade shows and meeting occasions. And I am looking forward to that! ●

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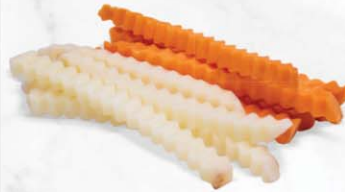
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Strong Roots Receives USD55m Infusion of Capital from McCain Foods



To help Strong Roots, a leading plant-based frozen food company, grow and further drive its work in sustainability, McCain Foods, the family-owned world leader in frozen potato specialties and appetizers, announced an investment of USD55m, and a minority stake take in the business. The partnership enables Strong Roots and McCain Foods to continue meeting the rising

consumer demand for healthy and natural food globally. "Strong Roots will use McCain Foods' global presence to expand its footprint in existing markets, including UK, Ireland, US, and to enter new markets working with new retailers. The partnership will also allow Strong Roots to expand into the foodservice market through McCain Foods' out-of-home network," based on a recent press release.

No More Plastic Packaging for French Fruits & Vegetables

Beginning with January 1, 2022, the French authorities introduced a ban on the use of plastic packaging for a range of fruits and vegetables, to the dismay of the sector's stakeholders. Nevertheless, the entire legislative package will not fully come into force until 2026, allowing the market players to adapt, including on the sale of red fruits considered fragile. Six months have also been granted to use up existing plastic packaging stocks. "We were never consulted," complained Laurent Grandin, head of the fruit and vegetable sector's Interfel association, according to AFP. He added that the costs were "insurmountable" for small companies who would have to keep using plastic to protect exports, notably to Britain, a major client for apples.



Fresh Yellow Potato Sector Has a Growth Trend 'Unlike Any Other'

Fresh yellow potato shipments for the 2021-2022 season are close to 604,800 tons, a 3.5% increase from the previous shipping season, helping this sector to grow 'unlike any other'. According to the United Potato Growers of America CEO, Mark Klompien, the Red River Valley is increasing fresh yellow potato production at the expense of fresh red potato acres, but the region is still the largest producer of fresh red potatoes. North American fresh red spuds shipments are showing a decline from the previous few years. "That's driven by the cannibalization of red acreage into yellow acreage and the significant drought conditions," Klompien added, cited by Red River Farm Network. He added that for the 2022 growing season, the cultivars' acreage will be based on strong alternative crop prices, cost of production increases, and other external factors.



Haith Has Five Mobile Baggers in Production



With currently five mobile baggers in production (a first for Haith's), the company has recently seen its turnover almost double year on year (Y-O-Y). In the spring of 2021, Haith changed its internal structure, promoting Paul Ramplin to the role of

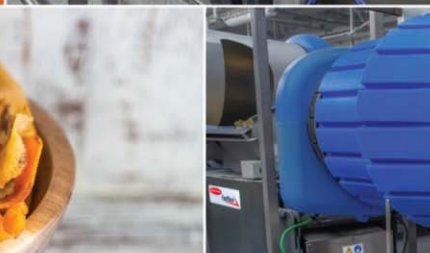
technical sales manager, which according to the company's managing director, Duane Hill, brought a renewed focus on growing the industrial side of the business. Developed by Haith in 2010, the Mobile Bagger can operate from mains power or a generator to offer a cost-effective way of packing on-site without the expense of installing a fixed-line.

The machine features a 20-ton feed hopper with specially designed twin remote mounted vibratory side panels that transmit all the vibratory energy into the material and not the hopper's walls.



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Lamb Weston High on Sales But Also on Expenses

For its fiscal second-quarter 2021, Lamb Weston Holdings reports its net sales increased USD110.5m to USD1,006.6m, up 12% versus the prior-year quarter, with volume and price/mix each up 6%. “The Company expects fiscal 2022 net sales growth will be above its long-term target of low-to-mid single digits. The Company anticipates net sales growth in the second half of fiscal 2022 will be driven

largely by price/mix as the Company’s recent pricing actions are more fully implemented in the market. The Company expects to continue to benefit from solid global demand for frozen potato products, although growth in sales volumes may be tempered by disruptions to the Company’s production and logistics networks, as well as the effect of the COVID-19 variants on restaurant traffic and consumer demand,” according to a recent company press

release. On the other hand, income from operations declined USD25.2m to USD114.4m, down 18% versus the prior-year quarter, reflecting lower gross profit and higher selling, general and administrative expenses (“SG&A”). Gross profit declined USD18m, as the benefits from increased sales volumes and higher price/mix were more than offset by higher manufacturing and distribution costs on a per-pound basis.



KFC Runs Out of French Fries in Kenya



At the moment, KFC’s Kenyan clients have to choose from the swap options to their French fries because the fast-food giant has suffered a shortage of potatoes at its outlets in Kenya, following delays in delivery from its overseas suppliers. The hitch in the global supply of potatoes has to do with postponements in shipping lines due to the COVID-19 situation, with ships being delayed for more than a month. KFC, which operates locally through franchisee Kuku Foods East Africa, does not source potatoes locally due to global quality standards. Through its official voices, the company mentioned that it cannot bypass the approval procedures to allow local farmers to fill in the gap.

Spud Growers See Potato Prices Going Up

The farm-level spud prices for the US Idaho state growers are up significantly since the global potato market is tight on supply. During their usual price drop in the August-October period, Idaho Russet potato prices went down USD8 per 50 kilos bag in 2019, USD12 per 50 kilos bag during that period in 2020, but only USD3 per 50 kilos bag during that same time in 2021, according to a mid-December 2021 University of Idaho Ag Outlook Seminar presentation, cited by Intermountain Farm&Ranch. The prices soared partway due to Idaho growers producing a smaller cultivar crop in 2021 compared with 2020. Idaho growers planted 127,574 hectares of potatoes in 2021, compared with 121,405 in 2020, but total statewide production decreased 2% in 2021 to 6,70m tons. Total US potato production also dropped, from 21,3m tons in 2020 to 20,9m tons in 2021. That drop in Idaho potato production was due largely to last year’s drought conditions and unusually high summer temperatures, which sharply reduced average yields.



UK Potato Growers’ New Gold Fever - Irish Gold Variety



The new potato variety ‘Irish Gold’ is rapidly gaining the attention of UK growers. The variety supplied exclusively to UK-based O’Kane Foods for the United Kingdom market was bred by famous breeders Harry Kehoe and Andrew ‘Buddy’ Mathews in the early 2000s but has just recently been brought to the market. Following enough time of building seed stock in Donegal, Maurice Mathews, son of Andrew, brought the Irish Gold variety to the Irish market. The variety is now grown by the Spillane family, potato growers based in the Gaeltacht region of Co Meath. Nevertheless, Maurice Mathews has just secured an exclusive deal to deliver the variety to UK-based O’Kane Foods who supply the UK market. According to YourIrishShop, Irish Gold is a flavorful, exciting new variety of Irish potatoes. “This oval-shaped potato has a golden skin with distinctive purple eyes and creamy flesh. While it is similar to Kerr’s Pink with its dry, floury texture, the Irish Gold has a unique sweet, buttery flavor. It is versatile and can be boiled, baked, steamed, roasted, and chipped,” the site experts mentioned.



Calbee Introduces Own Potato-growing Kits

Recently, the Japanese potato chip brand Calbee has unveiled its newest offering: potato-growing kits. This time, the famous brand is launching two items as part of their potato-focused portfolio, the first being Poroshiri, a bag that contains two seed potatoes also named after Calbee's in-house potato variety. There's also the Potato Bag, a 22-pound sack filled with coconut peat, palm mulch, and fertilizer - all of which are 100% plant-based - so customers can plant their seed potatoes and begin growing their garden. The Potato Bag's design is similar to that of Calbee's potato chips but also doubles as a pot complete with drainage holes. All of the substances used inside the Potato Bag are 100% plant-based, which means they can be safely disposed of by your local trash collection rules and regulations. These products are being sold through the Protolife horticulture soil company and can eventually be found all over Japan when the proper season comes around.

Healthier Ground Protein Product Line With the Help of Potatoes

By substituting a percentage of the meat with potato, Botaniline – a food technology and innovation company that has created a healthier ground protein product line and partnered with National Food Group to distribute these convenient meal solutions nationwide – can achieve cleaner label processed meat products that are lower in sodium and saturated fat. The proprietary technology uses potatoes that are cut a certain way and cooked at a specific temperature for just the right amount of time. Since the potato acts as a binder and peptide, it naturally helps proteins retain their flavor so nutrition panels come out looking a lot cleaner. The ingredient list can be cut in half and substituted with just one: "potato." The new brand of healthier, convenient food items is being introduced and distributed by the National Food Group to schools, healthcare facilities, and government agencies nationwide.



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Conveyors: Maximizing Speed and Profit

Potato processors require solid conveyors that run constantly without failing, because when a conveyor goes down, the entire production line goes down. Product quality and maximizing yield are two important and frequent demands from technology beneficiaries. Quality must be maintained throughout the process and at every equipment transfer. If there is product breakage during transfers, yield can be significantly affected.

by Tudor Vintiloiu

Aspud processor usually selects the ideal conveyor for each application. From a 'brute force' vibratory conveyor at receiving and vibratory conveyors handling a wide variety of tasks throughout the production line to impulse shakers that feed packaging machines, matching the conveyor to the process helps maximize overall equipment effectiveness (OEE).

MONOBEAM CONSTRUCTION

Key Technology introduced its Marathon® vibratory conveyors with monobeam construction last year. Featuring a narrow frame that's less than half the surface area of traditional Marathon frames, monobeam shakers offer better access to the conveyor bed and

fewer parts to clean. Available in lengths from 9 to 15 meters, this is Key's longest monobeam conveyor. According to the company, Marathon delivers world-class performance and reliability while the monobeam construction minimizes footprint and enhances equipment sanitation to improve food safety. "When we launched our Iso-Flo® shakers with monobeam in 2016, they were a huge hit. Customers immediately began asking for monobeam on our lengthy Marathon conveyors, so we started designing, building and testing. Now, we're getting great feedback from customers on this new model as well," said Jim Ruff, Vice President of Process Systems and Integrated Solutions at Key Technology. "Here



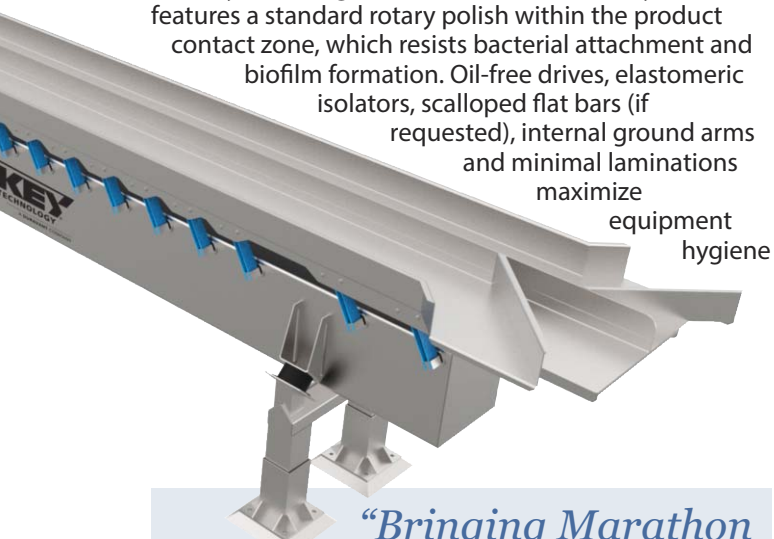
at Key, we're working non-stop on new innovations. We just introduced our Zephyr™ horizontal-motion conveyor, which produces minimal product bounce at high capacities. Bringing Marathon with monobeam to the market further expands our set of solutions." Ideal for processors that need a high degree of equipment hygiene and/or a small footprint, Marathon with monobeam is suitable for a wide range of bulk food applications, from raw receiving to packaging, including product collection, transfer and distribution. Unlike a traditional shaker, which has a frame and spring arms on both sides of the conveyor bed, monobeam conveyors position the frame and spring arms underneath the bed to maximize sanitation

while improving operator access and safety. Monobeam inspection shakers enable laborers to get closer to the bed for improved product visibility and ergonomics. All Marathon conveyors, including the monobeam models, use natural-frequency vibratory motion to distribute bulk foods long distances on a single unit. Marathon can replace several shakers in a row, relying on only two independent, frame-mounted drives to improve efficiency and reliability. Additionally, fewer supports to the floor eases cleaning and sanitation. Two foot-mount, self-synchronizing motors transfer the force of the frame to the bed without mechanical joints to further improve efficiency, reduce maintenance and minimize downtime.

Key tailors each Marathon using predictive modeling and Finite Element Analysis to define the product characteristics and deliver superior performance. Available in lengths from 9 to 15 meters (30 to 50 feet) and widths from 50 to 100 cm (20 to 40 inches), Marathon with monobeam can achieve conveying speeds greater than 15 meters (50 feet) a minute, depending on the application. The conveyor bed can be tilted to draw product to one side, and flow direction can be controlled with optional side outlet diverters. Marathon with monobeam can be built with end-mounted drop-out gates, diverters, end-mounted screens and covers when needed.

SANITARY ADVANTAGES

In addition to the sanitation enhancements from its monobeam construction, Marathon offers a variety of sanitary advantages. Its stainless-steel conveyor bed features a standard rotary polish within the product contact zone, which resists bacterial attachment and biofilm formation. Oil-free drives, elastomeric isolators, scalloped flat bars (if requested), internal ground arms and minimal laminations maximize equipment hygiene.



“Bringing Marathon with monobeam to the market further expands our set of solutions.”

Jim Ruff, Vice President of Process Systems and Integrated Solutions at Key Technology

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and help meet rising sanitary standards and regulatory requirements. The monobeam frame is sloped to prevent product and moisture build-up that can harbor bacteria. Marathon is available in four different finishing standards, and its rotary vibratory drives are available in either stainless steel or food-grade epoxy finishes. Marathon with monobeam is suitable for fruits, vegetables, potato strips, potato chips, nuts, meat, poultry, seafood, dairy products, confections, snacks, cereals, grains, seeds and more. Like all Key equipment, these versatile conveyors are backed by Key's industry-leading, five-year warranty, which ensures equipment reliability and limits the processor's total cost of ownership.

FLEXIBILITY IN DESIGN

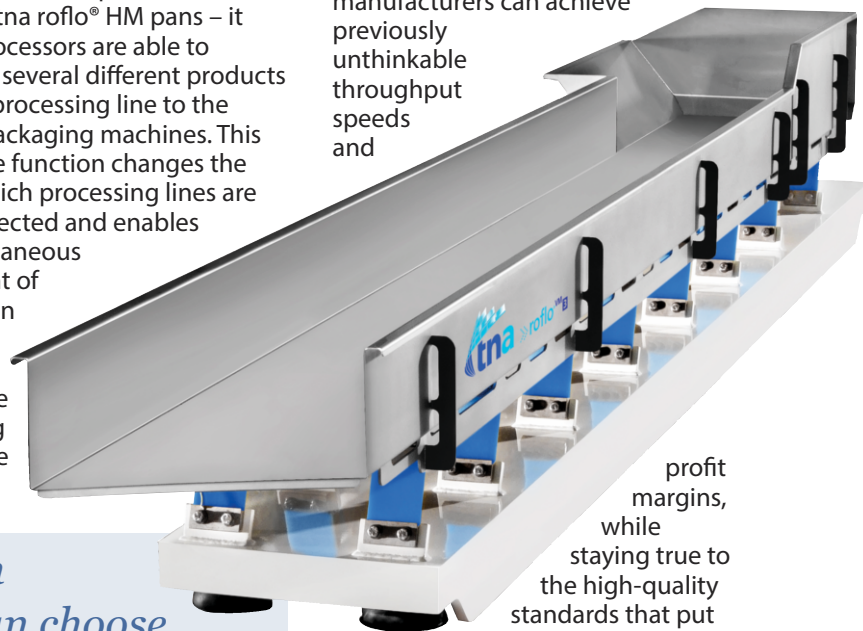
tna says both their horizontal motion and vibratory motion conveyors are popular options as they allow the ultimate flexibility in designing the complete

processing solution. In comparison to other models available on the market, they offer total direction reversibility, helping to reduce plant footprint – a key differentiator when space often comes at a premium. "With our horizontal motion conveyor, for example, manufacturers can choose to add a 'switcheroo' or 'lifteroo' feed line. A mechanism that separates, tilts and turns the tna roflo® HM pans – it means processors are able to distribute several different products from the processing line to the waiting packaging machines. This innovative function changes the way in which processing lines are interconnected and enables the simultaneous movement of products in several directions on a single packaging line for the greatest

possible flexibility," says Anurag Mitra, Product Marketing Manager, tna.

The tna roflo® range also features a unique gateless design, which helps to reduce cross-contamination since there is less opportunity for unhygienic bacteria to build-up and is easier and quicker to clean.

Such advanced options present a world of opportunity for customization, letting producers optimize their conveying system for different throughputs, bulk densities, piece behavior and sizes. The fast, yet gentle motion produced by vibratory conveyors provides the ideal solution for minimizing product giveaway, particularly when transporting delicate products, such as potato chips. Their horizontal motion counterparts can be relied upon to transport products quickly and safely too, with a flat configuration and tightly controlled forward and back motion that makes them perfect for heavily seasoned applications, like potato wedges or flavored French fries. With this 'best of both worlds' approach, manufacturers can achieve previously unthinkable throughput speeds and



profit margins, while staying true to the high-quality standards that put them on the map.

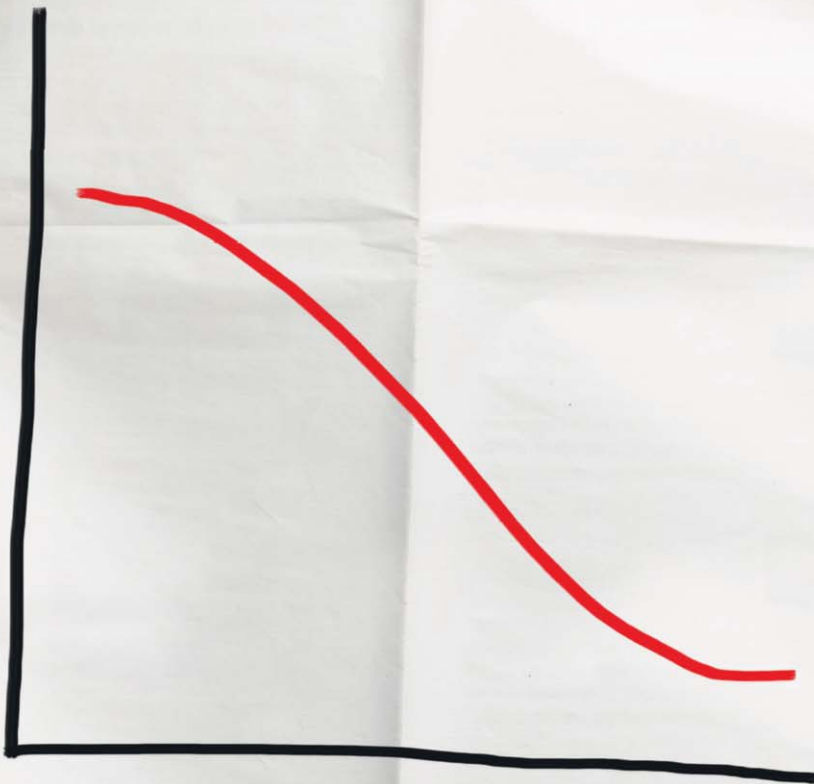
Where space is at a premium, some of these systems even offer the potential to completely reverse product flow, making sure every square foot of a facility is harnessed for production. •

"With our horizontal motion conveyor, manufacturers can choose to add a mechanism that separates, tilts and turns the tna roflo® HM pans."

Anurag Mitra, Product Marketing Manager, tna



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Business Viewpoints for 2022

2021 was a panic-filled year, during which the business environment refined its defenses and growth mechanisms in a difficult market context. In the end, the balance was a positive one, with the industry registering, in some places, spectacular growth. For 2022, representatives of some of the most important equipment manufacturing companies talk in unison about reinvention, adaptability, differentiation, and care for the needs of their customers. A new year that, on top of the ongoing health crisis, presents a series of fresh challenges - from supply chain disruptions to increased utility costs and labor force shortages. But what none of the viewpoints shared with us are missing is hope, an essential attribute for a long-term winning business.

by Tudor Vintiloiu

Alan Major, Chief Sales Officer, Urschel



Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

The past two years have not been without challenges. In defining 2021, I would say it ended up being better than expected. Surprisingly, it mirrored the successful revenue Urschel achieved in 2019. Going into 2021, it was difficult to gauge the market due to the uncertainty we were facing because of the pandemic.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

Our expectations for 2022 project a steady growth for our overall business. We are optimistic the success of 2021 will continue. Many projects that were originally put on hold due to the uncertain state of the pandemic are now moving forward. We are working with our customers with ongoing plant expansions and line additions that had been put on hold in 2020.

How do you estimate the market will evolve and what is your priority list for 2022?

We are anticipating a relatively strong 2022. Our priority list includes assisting our customers to build and expand on their operations - getting projects back on track which were stalled during the initial pandemic circumstances. We will continue to move forward overcoming some of the COVID challenges. As the government and businesses adapt to the existence of COVID long-term, we are very optimistic that the pent-up demand for spending over the previous two years will ease, and we will see growth in the areas that have been stagnant.

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

The greatest impact on our suppliers has been the difficulty of being reliant on the supply chain. The pandemic had an unforeseen negative impact on the supply chain of many suppliers. Moving forward, Urschel has discovered ways to adapt and adjust inventory to ease future situations. With in-house manufacturing, Urschel has limited vendors/suppliers and valuable long-standing relationships with them. Urschel suppliers went to great lengths and exceeded expectations to fill orders during these challenging times.

What are the biggest challenges you faced and where did the growth opportunities come from?

The biggest challenges we faced were projecting future sales, gauging what our manufacturing capacity needed to be, and how to continue to reach our customers during these unsure times when travel is limited and the impact this would have on the business.

Growth opportunities came from the shift in the marketplace as consumer habits changed from going out to restaurants to purchasing more and more items from supermarkets. Urschel sales shifted from restaurant suppliers to selling more parts to support food processors supplying to the supermarkets.

What are the pillars on which you have based your evolution this past year?

Urschel pillars of evolution included extensive live remote meetings with customers including test cutting of their products. Technology played a key role in overcoming the obstacles of lack of direct person-to-person contact. We relied heavily on our IT department and were very fortunate to have had installed many state-of-the-art infrastructure, bandwidth, and systems when our facility was constructed in 2015. These systems were important in maintaining customer contact.

Another pillar of importance is the fact that we engineer and manufacture our own components, so we did not have to rely on third-party agents to maintain parts inventory. With the supply chain crisis faced around the world, this was crucial in the success of our company. With engineers and skilled manufacturing professionals dedicated to producing quality parts, we were not as reliant as other companies who outsource their parts.

What is the most important asset you have in 2022 as a company?

The most important asset in 2022 we have as a company is our strength across the globe. Building direct offices in key locations around the world increases our effectiveness. We have direct, local people. Our distribution is an important aspect of our business. Investing locally and building offices is an investment in establishing relationships with food processors in the different areas of the world. Local contact has been very important in these COVID times of limited travel. The strong, direct network of sales, support, and service has been a huge asset to take care of customer needs directly. ●

Brian Barr, Director of Sales, Heat and Control



Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

For Heat and Control, 2021 was one of the most rewarding years in our history, yet not without significant challenges. Like many other companies, Heat and Control experienced supply chain and labor challenges, and they came during a time when our customers needed our solutions and services the most. Our leadership, our team members, our suppliers, and our customers all worked together to minimize the impacts of global challenges to help ensure that we continued to provide the equipment solutions and the same high level of support to which our customers are accustomed and which were required to keep our nation fed and our economy flowing. Our goal always is to help our customers achieve business continuity; we have been willing to do whatever was needed to get it done and plan to stay the course.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

Heat and Control's expectations for 2022 are simple – we are planning to change and to adapt to whatever new obstacles we may face! Specifically, we plan to continue investing in customer support for both onsite issues and training aspects to keep lines running at optimal levels, to develop design and application solutions that address specific manufacturing needs, and to improve integration of our spare parts team. Because the markets we serve and our customer needs are volatile, we look forward to rising to overcome every challenge. We are optimistic that we can continue the successes of 2021 and that we will rise above any added challenges as we continue to develop and to deliver the highest levels of technology, automation, and service for our customers.

How do you estimate the market will evolve and what is your priority list for 2022?

We anticipate the industry will continue to have difficulty in locating qualified and dependable labor and to have ongoing supply interruptions. As the market evolves, our priorities will remain productivity and automation. Because reducing labor while

increasing product output and quality are key to our customers' success, they also are our principal focus. Our customers' success and growth is paramount; and we will continue to design, to manufacture, and to deliver equipment solutions that allow the varied industries we serve to achieve their process, product, package, quality, productivity, and efficiency goals.

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

The pandemic has impacted a wide range of areas for our varied global partners. One benefit of having global partnerships is that we can share experience and solutions to common problems, including supply chain or problem solving. We also can balance supply chain requirements at a global level, which improves our ability to support all of our customers. With our global manufacturing partners (Ishida and CEIA), we have witnessed and learned from their strength and ability to navigate the global challenges with their insourcing capabilities, as well as their amazing network of supplier partners that help ensure their/our business continuity.

What are the biggest challenges you faced and where did the growth opportunities come from?

Like many other capital equipment companies, our biggest challenges revolved around supply chain issues, labor availability (meeting our growth requirements, as well as navigating attendance impacts of the pandemic), and the various challenges surrounding global shipping/logistics (both raw materials and finished goods). While we learned the value of quickly pivoting to meet varying needs and challenges, we continued to grow (and to meet the market needs of this growth) based on constant communication and on continued focus to meet every milestone possible (and brainstorming mutually beneficial solutions for those which were not possible). This ability to partner has aided our ability to continue to meet our growth initiatives while minimizing the impacts of our challenges on our customers' operations.

What are the pillars on which you have based your evolution this past year?

The key pillars Heat and Control has focused on include technology,

communication, service, adaptability, and teamwork. Technology is at the center of all that we do. As the leader in the various industries we serve, Heat and Control worked hard to maintain our focus on providing the highest level of solutions, performance, and uncompromising quality, regardless of the impacts created by the pandemic. Communication has never been as important as it has been over the past two years, and Heat and Control strives to be proactive in all aspect of our communications. We are here to serve, and the service pillar is an integral part of our DNA at Heat and Control. From our initial discussion of a project through years of aftermarket service and parts support, unparalleled service is a constant focus for our global team of experts. More than ever before, the ability to adapt was imperative to our (and our customers') success. With the market, supply, and production environment changing daily (and at times hourly), the ability to anticipate change was not only a goal but a requirement for survival and growth in 2021. Last, but not least, is the teamwork pillar at Heat and Control. Whether it be our internal teams or those formed with our customer/partners; the ability to collaboratively navigate the challenges of business over the last 2 years is rooted in the success of cross-functional teams aggressively striving to meet the challenges presented.

What is the most important asset you have in 2022 as a company?

Our most important asset continues to be our employees! Heat and Control's global team of more than 1,800 focused team members continues to provide the best in service and solutions to our customers. Our technology and performance-based solutions are optimized for each customer through the efforts of these team members; this allows our customers to meet their consumers' needs one product at a time. ●

Karel Van Velthoven, Product Marketing Manager, FAM Stumabo

Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

2021 was a good year. The potato segment has seen growth both for the potato chips and French fries segments. Our FAM Centris™ 315P and FAM Centris 400P slicing machines with GapSet™ and SureSet™ cutting head technology have further confirmed their presence in the potato chips market, with potato chips processors more than ever switching to our unique 12- and 16-station potato slicing technology.

Also, our FAM Tridis cutters maintained a very strong presence. Tridis is now in operation at major potato processors, who can rely on our Tridis technology for a wide variety of high-quality specialty cuts at medium to high capacity. The fact that FAM Stumabo has its own fully automated blades division as well as its own machine division allows good control over our supply chain. This also offers peace of mind for our customers, who with FAM Stumabo have access to a reliable partner with some of the best precision blades in the market, specifically designed and optimized for efficient integration in hydrocutters as well as cutting machines.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

We expect to see a continued growth globally in the demand for potato products. Challenges, such as recent potato shortages, might still linger on for a while and show that it's more than ever important to get the maximum out of every potato by using top-notch cutting equipment and knives that help processors maximize efficiency and yield. Cutting machines are probably the most value adding step in any potato processing line as it turns a potato into unique, high-value consumer products in a multitude of largely differentiating sizes and shapes such as wedges, dices, chips, fries, and a wide range of other specialty cuts. Needless to say, that efficient, high-quality cutting can offer potato processors major advantages and can also be a solution for several challenges further downstream such as starch and product loss, oil consumption, water, electricity usage, etc. With FAM Stumabo, processors find a reliable partner with top

notch cutting equipment and precision blades, offering them full flexibility to cope with challenges even as big as a pandemic.

How do you estimate the market will evolve and what is your priority list for 2022?

Being headquartered in Belgium, the largest exporter of frozen potato products in the world, puts our company right at the heart of one of the world's largest potato processing regions. Together with our Centre of Excellence for potato cutting solutions in the US, we also cover the major North American potato processing market. This allows us to closely interact with the potato processing industry allowing them access to our latest developments and innovations.

The potato industry, both French fries and potato chips segments, has by far the most advanced and automated processing lines in the entire food industry with many of them moving to 'lights-out' processing facilities striving for minimum operator intervention. Our priority has always been and will also continue to be in 2022 to focus on developing cutting solutions that offer maximum efficiency and yield by emphasizing on cut quality, reliability, flexibility, user-friendliness, operator safety, hygienic design and the lowest TCO. All our solutions are designed for easy integration into both new and existing lines from all major suppliers and are increasingly capable of upstream and downstream interaction. Stay tuned for more ground-breaking new developments from FAM Stumabo for the potato industry to be released in 2022!

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

A major crisis, such as a pandemic, most of all requires a great deal of flexibility to cope with a constant changing reality. Thanks to our strong global presence with our own offices and local partners in more than 70 countries, we managed very well



to adapt swiftly to new local situations and allowed us full continuity towards our customers. It has shown very beneficial to have full control over our own supply chain, by having both our machine and blades divisions in-house.

What are the pillars on which you have based your evolution this past year?

Since our inception more than 40 years ago, we never wanted to just sell machines, but always strived to offer dedicated customer- and application-specific solutions. Also in 2021, we have continued to invest in this customer-centric solutions approach with in-depth produce and production process knowledge and close interaction with our customers contributing to cutting solutions that truly make a difference.

What is the most important asset you have in 2022 as a company?

For FAM Stumabo, the people are our biggest asset. In our machine and precision blades divisions as well as with our partners around the world, it's our people that continue to be key for innovation and support our commitment and promise to our global customer base: 'Together we cut your product to perfection'. ●



Stefan Björk, Managing Director, Rosenqvists Food Technologies

low fat content. Furthermore, our development of Fryer for Specialty Products (FSP) has shown to be very successful for formed potato and veggie products so we feel well in line with next coming years' market demands.

We hope that sourcing of key components will improve during 2022 and that the severe cost increases for manufacturing materials will stop. The cost and availability challenge make it harder for us to plan projects as for all suppliers in the food sector. The future is still uncertain, but we wish for more stability.

How do you estimate the market will evolve and what is your priority list for 2022?

Despite serious challenges with increased costs around the world, we still anticipate continued growth for the food products we

work with. Potato chips, peanuts, snack pellets, French fries and other frozen potato specialties are all products with a bright future. They offer great tasting plant-based options for consumers in all countries.

We are aware that many food producers experience uncertain times that makes investment decisions more difficult. Still, many producers of potato chips enjoy a healthy demand and are pushed for large production capacities. For 2022, we will present and explain more about our new belt drying system for French fries. It offers improvements for hygiene and cleanliness. The added option of running the drying system with hot water re-using heat from the frying system is an important factor for producers. The coating line and double-frying system will continue to be a corner stone in our offering for French fries production. The low oil volume used and our ability to keep the pan and oil clean are important factors for our clients. The frying system for potato specialties has been upgraded thanks to high demands from our clients. We can offer perfect oil flow and product distribution along the frying belt length.

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

As mentioned earlier, the pandemic has not put a stop to any plans or projects for us yet. We are grateful that our employees have been and are all well and safe under the pandemic. Naturally, we miss the opportunity to meet our clients in real life to the extent we did pre-pandemic. This interaction is important to us to fully understand the challenges our customers' experience. Remote project management

and cooperation is now an integrated part of the way we run projects.

What are the biggest challenges you faced and where did the growth opportunities come from?

The last couple of years has been challenging, this is true. We have spent energy in keeping our staff safe in office and when travelling. Without our employees, our operation stops, so this has been the most important challenge for us. Up to now, we have been very fortunate, and we have never been forced to close down our operation during the pandemic. Facing higher material cost and sourcing of components continues to be a challenge for us at Rosenqvists Food Technologies. We are longing for a more stable supply situation and for the material cost levels to cool down.

The challenge of working remote and still cooperate in a good way with our clients has led to higher productivity. Planning and implementing a project for a new processing line today requires more active planning together through online meetings.

What are the pillars on which you have based your evolution this past year?

We have identified several technical drivers for change affecting our clients. They can be related to food safety, sustainability, cost of production, handling product variations and new technology. The common denominator is summarized under the headline process optimization. Based on this analysis, we are focusing our innovation efforts in the following four areas:

- Process know-how and integration
- Advanced thermal treatment solutions (blanching, drying, frying and roasting)
- Sustainability through energy recycling and minimized water consumption
- Digitalization of services.

If we can continue to prove to our clients that we jointly can optimize their process and production, we remain delighted at Rosenqvists Food Technologies.

What is the most important asset you have in 2022 as a company?

I am proud of our history designing smart processing solutions for potato since more than 45 years. The ambition of Rosenqvists Food Technologies has always been to act as a long-term partner for our clients. We have listened to our clients needs and problems and we have, in many cases, been able to come up with good solutions. The willingness to listen and develop new functionalities is still what matters most at Rosenqvists Food Technologies. For this purpose, the most important asset we have in our company is the people working for us and partners we cooperate with. It is thanks to these key factors we keep improving more advanced solutions for thermal treatment of potato. ●

Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

We are summing up another intensive year at Rosenqvists Food Technologies. The partnership with our clients means everything to us. It is thanks to our client's input, requests, innovation plans and demands that we continue to evolve as a company. It is so fulfilling to go to work and see we can improve our client's product, support a new product launch, design a durable machine or simplify the life within daily line operation and maintenance.

This past year, I am especially proud of our work with new chips lines installed, new snack pellet lines, new large-scale French fries processing line, as well as further development for potato specialties. We introduced a new design for the belt drying system and made further enhancements for coating line and double-frying systems. During 2021, we continued to struggle with the global pandemic as everyone else. Thankfully, it has not stopped any of our plans or projects.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

Looking ahead, I see so much exciting product development among our clients. The plans for new product launches and increased production efficiency are many. Plant-based innovation is now the number 2-trend from Innova Market Insight for 2022. It is an important encouragement for us to continue our development. We have gained important experience with the RoastR during 2021. This new technology can offer new opportunities for veggie snack products with

Marco Azzaretti, Director of Marketing, Key Technology

Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

Throughout 2021, we've been extremely busy helping our potato processing customers add new capacity and modernize existing production lines, as they take advantage of favourable market demand for processed potato products. At the same time, like other equipment manufacturers, we've been dealing with significant logistic challenges in the supply chain. Overall, 2021 has both a very successful and a very complicated year for Key Technology.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

I think the same themes that characterized 2021 will play through 2022. We expect potato processors will continue to experience a favourable market situation and they'll keep working to position themselves to take advantage of that. As their partner, we'll be busy equipping them with the processing technology they need to maximize the profitability of their operations.

How do you estimate the market will evolve and what is your priority list for 2022?

The potato processing industry continues to evolve towards more applications of IIoT and Industry 4.0 practices to optimize operations. We expect to see even greater interest in the information analytics and AI capabilities of our optical sorting equipment, which give processors greater visibility and control over their product quality and process yield. Of course, one top priority for us is to continue to listen to potato processors – to understand how their challenges and opportunities are changing in these dynamic times.

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

The pandemic has impacted all industry participants in similar ways, making it more difficult to do business and driving increases in both cost and lead times. We've certainly learned to be adaptable – to be quick to pivot to new solutions when the previous ones no longer fit the current situation.



What are the biggest challenges you faced and where did the growth opportunities come from?

We've been facing an inflationary cost environment with many materials and components becoming difficult to procure due to unprecedented demand. Labor costs and availability have been similarly difficult. But those challenges can also be the source of opportunity. We've offset the impact of these challenges to our business and our customers by securing alternative procurement solutions and optimizing the design

of our equipment from a manufacturing perspective.

What are the pillars on which you have based your evolution this past year?

Embracing change is one pillar – be ready to execute with speed and agility. Another pillar is our close communications with our customers and business partners.

What is the most important asset you have in 2022 as a company?

Our customers and our employees our most important assets, today more than ever. ●

Stefan Toepfl, Managing Director, Elea Technology GmbH

Considering we've been adapting to the new normality of the market for two years, what does 2021 look like for your company when you draw the line?

2021 has brought a lot of unexpected changes. With ups and downs of pandemic measures we have observed a shift from food service and out-of-home consumption towards retail and home cooking. For Elea that meant less projects in French fries processing but an increasing interest in potato and vegetable snacks manufacturing as well as other applications of our PEF technology. Drawing the line, it has been a challenging year but also brought lots of learnings and new application areas.

What are your expectations for this year, keeping in mind the legacy of 2021, but also the current challenges?

We are expecting some market segments to return, and others to continue growing. Supply chain issues may become a challenge at present. We are used to work with longer lead time components and have established a forecast system to manage supply and pre-manufacture key modules. As a precaution against further component shortages or well as shipment issues we have increased our stock and are looking into mitigation strategies with our suppliers.

How do you estimate the market will evolve and what is your priority list for 2022?

With pandemic measures being dropped in some world regions we are seeing an increasing demand from French fries' processors. For that restart and potential growth, we have further developed our systems portfolio and are launching a 100 t/h PEF Advantage system later this year. Also, our all-in-one system PEF Advantage B 1 has been upgraded. Its maximum treatment capacity has been increased from 6 to 9 t/h with same compact form factor. And we are seeing substantial growth in vegetable processing for dried and fried snacks as well as fresh or frozen distribution.

What impact has the pandemic had on your business partners and what is the most important lesson you have learned in recent times?

Whilst all industry sectors have been affected, the impact on a certain area or stage of the production chain has been

very different. We have built a network of regional agents and distributors as well as integration partners early on, which we could rely upon when travel policies were restrictive. To me, a reliable and trustful cooperation is most important to tackle and overcome uncertainties. Lesson learned is to keep flexible and agile to react in changing situations. We have successfully supplied, installed and serviced systems with a mix of personal and virtual tools. I am very thankful and proud of the team at Elea and our partners for that.

What are the biggest challenges you faced and where did the growth opportunities come from?

From a business perspective uncertainty has been the major challenge, as supply chain as well as demand planning has become difficult. On a more personal level we have all been missing the direct and personal interaction with clients and cooperation partners during meetings, fairs as well as equipment installation and support activities. But using virtual cooperation tools also had its benefits. Time saved has been spent into further equipment and application design and we have run a number of development projects. The work has focussed on PEF use in potato snacks and flakes manufacturing, fruit and vegetable processing as well as equipment and process control upgrades. Being passionate about what

we are doing has been the major driver for growth opportunities.

What are the pillars on which you have based your evolution this past year?

Elea has a strong focus on R&D – which I see as the major pillar for application and equipment development. We have launched our new, versatile PEF Pilot system early 2021. That has triggered a number of new application ideas for texture management or infusion applications in vegetable processing, but also combined processes making use of freeze or microwave vacuum drying. We are involved in public funded and industrial projects with research centres and cooperation partners around the world – a continuous source of ideas and challenges fostering improvement.

What is the most important asset you have in 2022 as a company?

This year is our 10th year of marketing Elea PEF systems. A time in which we have contributed to evolve the technology from a lab scale curiosity into a full scale industrial process. That has only been possible by cooperation of a team of scientists and engineers and a network of agents and integration partners. Together with our partner DIL Engineering we have all required equipment design and manufacturing capacities, application support, test and service facilities available out of one hand – that team effort is what I see as our most important asset. ●



Gentle Washing Preserves Crop Value

Washing and removing soil, stones, and foreign bodies such as metal, wood, or plastics from potatoes considerably increases food safety, however, it is not only washing but also optical sorting and checking, that prevents impurities from contaminating the product.

by **Ionel Văduva**

It is important for any equipment that can separate crop from the soil, stones, and debris, to be designed to handle the cultivars gently, to ensure product quality. By using advanced and automated equipment, these processes can be carried out much quicker and more effectively than before, ensuring the process is efficient and productive, while maintaining the integrity, and ultimately the value of the crop. In this complex process of removing soil, stones, and foreign bodies from the potato crop, downstream from the intake system, which can either be via a box tipper or bulk intake hopper, the potatoes are generally taken over a dry-cleaning system to remove loose dry dirt, before entering the wet washing area. Whether destoning, soaking, washing, or polishing the cultivars, keeping water fresh at each stage of the process can have a significant effect on the finished quality of the product. It is well known that dirty water can contaminate crop, which can result in a dramatically reduced shelf-life. Therefore, water-recirculation systems that effectively recycle water during the washing process, are increasingly being incorporated as part of advanced potato washing systems. Water recycling systems not only keep water fresher for longer by removing soil from the water but also help reduce water consumption and minimize wear and tear on equipment that can be caused by soil damage. Downtime is reduced as the water recycling systems continuously work to remove soil from water, meaning equipment can also run continuously without the need to stop the line and clean tanks out.

END SOLUTIONS FOR POTATO WASH AND PACK LINES

Experts in this complex business area recently mentioned that companies are continuously developing new, sustainable technologies for the pre-cleaning-washing-destoning triad. In this respect, they see production consolidate into larger and larger operations, respectively larger and larger lines. This also brings with it a desire for increased efficiency and speed. The most effective way to address this issue is to automate as much of a clients' line as possible. One of the most advanced standalone solutions in this respect is Vege-Polisher from Wyma. Wyma pioneered this technology in the 1990's and has gone on to develop end-to-end solutions for potato wash and pack lines. "To choose a standalone product is very difficult. We do our best to make sure that every customer has the right solution to meet their specific needs. Potatoes are grown the world over in many different climatic conditions and require different products to get the best from every harvest. However, we have found that our Combi-Washer has proven to be very effective in a range of pre-cleaning situations. It combines a Barrel Washer with a Tank Destoner in a single machine," Jason Gerrie, general manager, Wyma UK, declared for Potato Business Digital. According to the company's expert, all elements of a clients' potato processing line should be optimized for gentle handling, to reduce potato bruising, product waste, and, ultimately, yield losses.

THE MAIN STEPS IN POTATO PRE-CLEANING, WASHING, AND DESTONING

After the intake system, the potatoes are generally taken over by a dry-cleaning system such as a coil-cleaner-star-cleaner or Variclean to remove loose dry dirt, prior to entering the wet washing area. "One of the more common systems for this is the Star Cleaner module," Key Technology experts told us. "This consists of six driven rollers with polyurethane stars. As the produce passes over the dry soil is loosened from the crop and drops through the gaps between the stars." The produce is then typically conveyed or elevated to a destoner module before entering the washer. "There are two kinds of destoners, the Cyclone destoner, and the in-line Flume or Jacuzzi destoner. The most common type used for potatoes is the Flume or Jacuzzi destoner. The integral destoner is an effective method of separating stones from produce using water flow. The system is linked by pipework and mounted directly to a barrel washer and uses common water pulled from the filter of the barrel. The water is pumped at pressure into the back of the de-stoner which creates an uplift allowing produce to be carried over into the barrel of the washer and stones to fall and be collected on the discharge elevator. The flow rate can be varied by a manual valve to suit crop conditions, type, and size. Stones are delivered to one side of the system by a chevron-crested elevator. Once destoned, the produce enters the barrel washer," the company's representatives added. The Herbert Barrel Washer is a gentle

but effective method of washing produce using a semi-submerged rotation barrel to move potatoes through its length. Cleaning is achieved by produce moving in and out of the water and in contact with the surface of other produce. "A door at the end of the barrel has a segmented aperture to allow produce to exit the barrel. The door regulates both the flow of the produce (throughput) and can also hold it in the barrel increasing the 'dwell' time to achieve improved cleaning/washing. After the barrel washer, the produce is typically passed over a Sponge Drier to remove the excess water before the next stage of the process," Key Technology engineers explained. Potatoes are delivered onto the Herbert sponge drier, normally from a washer elevator. If fitted, an initial pintle roller allows excess water to be removed before drying; also brush rollers can be fitted to help remove any remaining small stones or where a destoner is not fitted upstream.

Produce moves across the sponge disc rollers being continuously rotated so all the surface makes contact with the sponge to assist drying. Movement is caused by product pushing product over the rollers. At the end of the drier a discharge chute delivers produce onto the following equipment.

CUSTOM-BUILT POTATO GRADING AND WASHING SOLUTION

A custom-built potato grading and washing solution from Tong Engineering has enabled a leading US potato processor to increase the sizing potential of both dirty and washed crop while maximizing efficiency and minimizing waste across its entire potato processing operation. Tong's grading and washing line at Skone & Connors gently handle the crop from truck to bags and boxes. Featuring a high-capacity intake system, the crop is transferred to a four-row model of Tong's industry-leading EasyClean separator, complete with full Auto-Touch HMI control, for unrivaled cleaning and control, according to the company. Tong's client also opted for a 20-ton capacity accumulation hopper which allows the

option to simply intake, clean, and hold crop in the hopper until it is called for. "Following the accumulating hopper is a series of Tong EasyGrade screen modules for gentle and accurate grading of the dirty crop. The shed can choose to grade dirty crop at this stage or bypass straight to a Tong stainless steel next-generation barrel washer, with custom-specification including an integrated destoner, power-spray booster bar, auger, sludge-scraper and floating debris remover," Charlie Rich,

export sales manager and head of US Sales at Tong Engineering mentioned in a recent press release.

The flagship, 14-brush model of the company's low maintenance, high capacity TPS-PRO polisher is fitted after the washer for an enhanced and polished finish. The crop is then dried as it passes over Tong's latest direct-drive sponge dryer. Both the polisher and sponge dryer feature a motor on every shaft for maximum performance and minimal maintenance. Crop inspection is carried out on a six-man roller inspection area and the washed potatoes can then be

split into five sizes with another series of EasyGrade screen modules before it is packed into bags via a series of Tong big bag and bin fillers.

"The full Auto-Touch HMI package with total online support features some significantly time-saving diagnostics including isolator and inverter feedback, E-stop detection and location as well as precise information on sensor activation and any motor trip or failures that may occur," Rich concluded. •



Technology in Potato Cutting

The Model CC Slicer continues to be the go-to slicer for chips/crisps. The operating principle could not be more proven in the industry. Product is delivered to the feed hopper assembly and enters the rotating impeller. Centrifugal force holds the product against the inner surfaces of the each cutting station. As product passes each cutting station, slices, shreds, or strips are produced. The machine may be equipped with a 2, 5, or 10 HP (1.5, 3.7, or 7.5 kW) motor.

by Mike Jacko, Vice President of Applications & New Product Innovation at Urschel

Urschel is continuing to expand on the machine's capabilities. It's amazing how a machine could capture such a strong market, but the CC has evolved with the crisp/chip industry. We have developed a wide spectrum of slice shapes including Crinkle, V, Flat-V®, and Z.

POTATO SLICING VERSATILITY

Widely known for slices, the CC provides even more versatility in the many shred shapes including Full, Reduced-V, Full Flat-V, Reduced Flat-V, Oval, Reduced Oval (Crescent), Strips, Julienne, and even grating options. Customers continue to push Urschel to explore even more shapes, and this remains an active project. The development of the SH-14 (Shredding) and SL-14 (Slicing) MicroAdjustable® Heads has made a huge impact on increasing capacities. The advantages of implementing one of these heads don't end with the increased capacity due to the 14 cutting stations. Processors are experiencing longer run times between knife changes. Operator interaction is minimized. Both heads are more user friendly versus the

standard 8-station heads. Urschel is continuing to expand on the 14-station line of cutting heads. Notably, the SlideLocc™ .212V Slice, which offers three simple steps of slide, lock in place, and tighten. I cannot disclose too much information about our research and development strategy because R&D takes time, but processors are continuing to ask Urschel to manufacture even more machines like the CC with higher capacities, larger throughputs, and a few more options. Urschel is willing to take on this challenge. Urschel partners with customers around the world. We have invested in the infrastructure to strongly support customer initiatives. Direct offices offer customers direct assistance with their specific objectives. Some of our customers have shown a strong interest expanding on the capabilities of the CCL. The CCL is a member of the CC series. It offers unique lattice slices with a distinct operating principle. Rotating potato holding tubes allow the potato to be rotated in a vertical axis while being revolved in a radial direction. Centrifugal force holds the

potatoes tightly against the inside surface of the spherical-shaped slicing head. As the potatoes rotate inside the slicing head, they make an approximate one-quarter turn between each of the four crinkle knife stations. This results in intersecting crinkles on each side of the slice.

DICING ADVANTAGES

Salty snack manufacturers, including the growing potato snack market, look to the DiversaCut series. In addition to salty snack potato products, the pet food industry's use of sweet potatoes as an ingredient in their products is also on the rise. Hopper fed, the series produces one-, two-, or three-dimensional cuts. Product delivered to a feed hopper enters a rotating impeller. Centrifugal force holds the product against the inside of the case. Impeller paddles carry the product past the slicing knife. An adjustable slice gate at the top of the case determines the slice thickness. Slices pass between the slicing knife and stripper plate, and then enter the circular knives where they are cut into strips. The strips pass directly into the crosscut knives where the final cut is made. Strip cuts



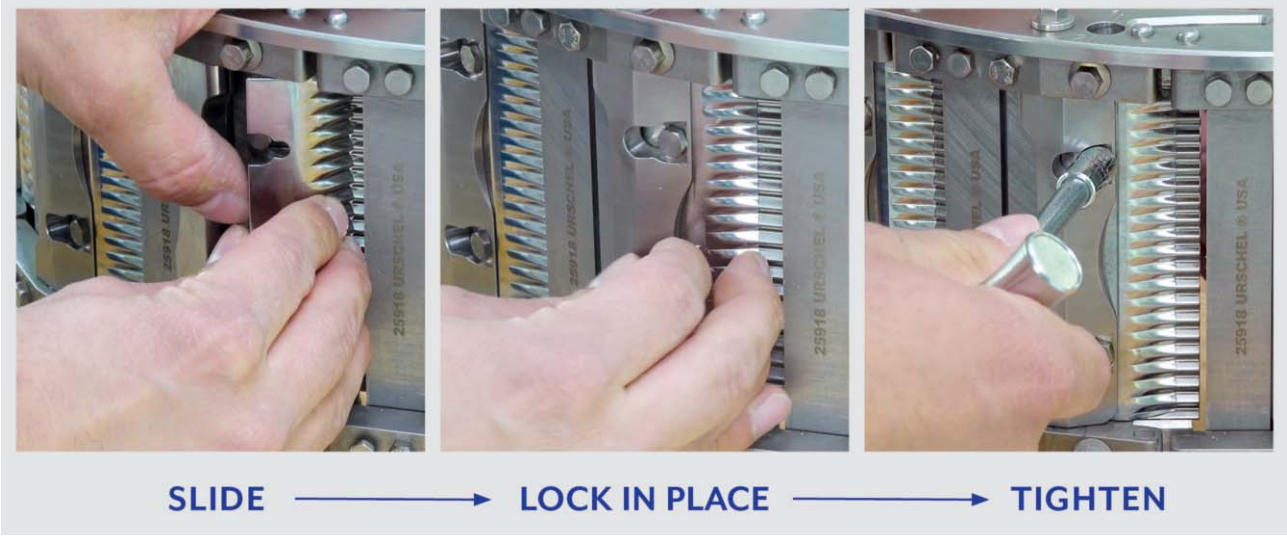
are produced by removing either the circular or the crosscut knife spindle.

Slices are produced by removing both of these spindles. Shreds are produced with shredding discs in place of the crosscut knives. The DiversaCut series is made up of several models. Notably, the DiversaCut 2110A® Dicer (DCA) and Sprint 2® Dicer (SPR2). The DCA is one of our larger dicers and accepts input products up to 10" (254 mm) in any dimension, whereas the SPR2 possesses a smaller footprint and accepts products up to 6.5" (165 mm). The DCA may be outfitted with either a 5 or 10 HP (3.7 or 7.5 kW) and be able to run up to 90 hertz with supported heavy-duty components/gearing to obtain unsurpassed capacities. The SPR may be equipped with a 1.5 or 3 HP (1.1 or 2.2 kW) to offer flexibility to small to moderate size processors. The DiversaCut technology and the growing number of salty snack applications and growing pet food sweet potato uses complement each other. The DiversaCut series will produce slices, strips, granulations,

shreds, or dices in flat/straight or a variety of crinkle and V shapes. Deep crinkle, granulation, and strip cuts have shown to be the most popular in the last two years. Customers appreciate the versatility in the ability to switch from one cut to another as they add SKU's to their product lines. Ease of maintenance and operation with limited operator involvement is a key feature. Attention to detail in construction, for example built-ins such as the circular knife spindle carriage to expedite changeovers, is part of the intuitive design. Other elements include a slide-in, removable slicing knife, which offers cost-savings and a dial-in slice adjustment knob. Swing away panels throughout the machines offer full access without having to rest any panels on the plant floor. New to both the DCA and SPR, a built-in conveyor discharge. This feature enables full discharge of cut product and is preferred among batch processors dispensing into totes. The conveyor discharge is designed to be at the most optimum height specifically for totes.

COST-SAVING, VALUE ADDED OPPORTUNITIES

A number of processors are already building SKU's instead of 'scrap' product. Processors recognize the costs associated with disposal or third-party processing service fees, and they have developed value added products to actively benefit their bottom line. Cost-savings associated with this may also reduce water, overall power usage, and positively impact environmental aspects. Further reduction to produce value-added opportunities may be accomplished with a number of Urschel customer may choose to examine additional capabilities for a machine the company has on-site. For example, a potato customer who is already running a CC with a shredding head may opt to purchase one or more grating heads to develop a further reduction. Incorporating a DiversaCut or one or more models from the Comitrol® Processor line are both popular options. A DiversaCut dicer may be to create smaller cuts from products such as fries, patties, or other preformed potato products. It may



Expert View Urschel



also be used as a precutter in conjunction with one of the Comitol Processor models.

The Comitol® Processor series offers several different models from which to choose, products may be reduced to coarse or fine particles down to micro-dimensions. Every model features continuous single pass operation with no operator adjustments.

The line focuses on particle size reduction. A reduction head in a fixed position works with a high-speed impeller that precisely and incrementally shears the product to a specified target size. Standard operations include granulating, flaking, slicing, dispersing, blending, homogenizing, milling, shredding, liquefying, emulsifying, and pureeing. Comitol versatility processes various consistencies from dry to paste to liquids. Different styles of impellers are paired with reduction heads depending on reduction application. Comitol models vary in feeding method, horsepower, and style and size of reduction heads. Oftentimes, two models may be used in tandem in a line depending on customer goals. There are 3 main styles of reduction heads: the Cutting Head, Microcut Head, and Slicing Head. The Cutting

Head is comprised of uniformly spaced, vertical knife columns arranged in a circular fashion and held in place by thin horizontal separators. The leading edge of each vertical knife is a sharp knife edge. Cutting heads are constructed of special wear and abrasion resistant alloys and can usually be resharpened for extended use. The distance between the horizontal separators and the vertical knife columns defines the opening through which the product must pass and helps determine the final particle size and shape. The Microcut Head offers the smallest degree of particle reduction and is comprised of a ring of closely spaced blades. When product is revolved inside this ring of blades at very high speed, centrifugal force causes pressure against the blades equal to several thousand times the weight of the product. The leading edge of each blade is a sharp shear edge for cutting accuracy, and the blades are carefully positioned to effectively reduce products down to micro-dimensions. The Slicing Head is a precise, miniaturized version of other Urschel centrifugal slicers. It consists of a ring of stationary slicing knives held in place by adjustable knife holders. Centrifugal force created by the rotating impeller causes the

product to press firmly against the inner surface of the knife holders to produce uniform slices at each knife location. Designed for applications where the final dimension is a specific slice thickness from .020 to .060" (.5 to 1.5 mm).

The Comitol Processor Model 1700 accommodates all three styles of reduction heads for maximum versatility. Sealed enclosure deters escape of dust, vapor, and liquid when installed in conjunction with a collection system. The Comitol Processor Model 3600F is another widely sold machine. The compact size is ideal for small volume to high-capacity users. The 3600F is equipped with the Cutting Head style of reduction heads and offers positive feed assistance via a screw feeder. Urschel has free-of-charge test cutting available in offices around the world. As customers look to expand their SKU's and build their lines, test cutting is a great first step. Urschel lab technicians have experience with thousands of cutting applications to assist with individual goals. Test cutting is available in-person, live remotely, or via video. Test cuts may be scheduled through their local Urschel contact. •



It's all about **POTATO**



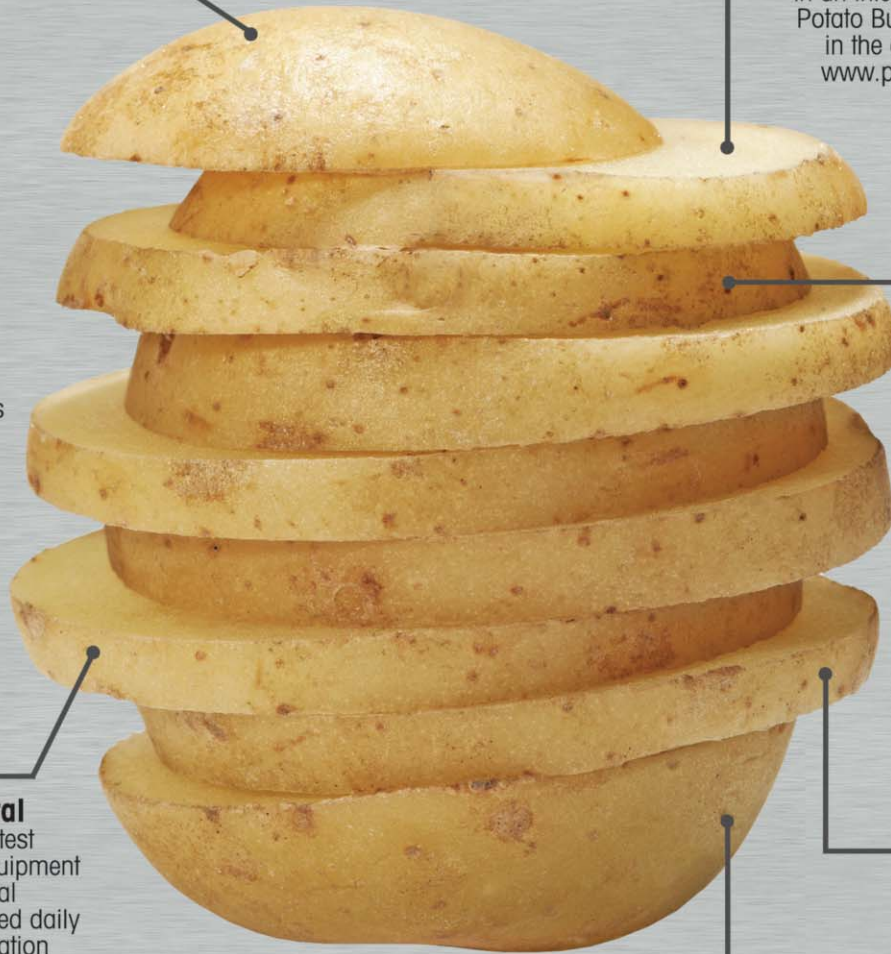
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Potato Processing International has been serving the global potato processing industry for 25 years and is regarded as a must-have information source for potato processors, equipments and ingredients manufacturers, as well as players in storage, retail and foodservice. This business-to-business magazine is published six times per year and continuously strives to be the most comprehensive publication, containing in-depth articles, expert views from some of the most respected companies in the industry, exclusive interviews, as well as news and trends.



POTATO BUSINESS Portal

From breaking news to the latest innovations in processing equipment and potato products, the portal potatobusiness.com is updated daily with the most relevant information for all players in the potato processing and storage industries. Regarded as a trusted source of information, the website also contains exclusive blog articles and white papers on various current topics that concern the potato universe.



POTATO BUSINESS DIGITAL

Tailored specifically to meet the needs of the busy professionals in the potato industry, Potato Business Digital is the first industry standardized digital magazine for tablets and mobile phones. This quarterly online publication presents exclusive articles on various processing topics, as well as information on ingredients, food safety and storage innovation, in an interactive and dynamic form. Potato Business Digital is available in the click-to-read format on the www.potatobusiness.com portal.



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A COMPLETE COMMUNICATION PLATFORM



Coming Clean About Sanitation

Compliance with hygienic design guidelines not only ensures conformity with laws and standards, but also gives manufacturers peace of mind: Production is always safe and clean. The product leaves the factory in perfect condition and without contamination. Employees and the environment are protected from potential hazards.

by Tudor Vintiloiu

Process technology machines and machine line parts in food manufacturing are known to have to meet the highest hygienic standards. But how can these be implemented in practice? What are the potential risks and how can they be systematically avoided? Answers are provided by the comprehensive approach of hygienic design, which takes into account construction details as

well as production peripherals and employee behavior.

PRE-PROCESSING BEST PRACTICES

According to the European and Mediterranean Plant Protection Organization, disinfection procedures should form part of good plant protection practice. As a general phytosanitary measure, potato storage and handling equipment should be regularly cleaned to

reduce general pest and disease problems in potato production. Moreover, cleaning and disinfection procedures are obligatory where quarantine diseases such as ring rot and brown rot are found. This is because all machines, materials and equipment that come into contact with infected potato material can become contaminated with the bacteria and subsequently act as a potential source of infection. To minimize the risk of introducing

or spreading ring rot or brown rot on potato production premises special attention should be given to:

- Sourcing seed potatoes from areas or places of production which are known to be free from ring rot and brown rot
- Separating the handling and processing of seed and ware potatoes unless suitable cleaning and disinfection has been undertaken
- Storing seed potatoes in clean or new boxes or sacks
- Avoiding cutting or de-sprouting seed potatoes
- Employing good routine hygiene measures.

Chemical disinfection can be used in addition to cleaning as part of general good hygiene but is not as important as cleaning. The most effective decontamination program will include the following steps: cleaning, disinfection, rinsing (where appropriate), drying.

CHOOSING THE RIGHT DESIGN

Two factors have a decisive influence on the suitability for production processes with high hygiene requirements: the choice of suitable materials and the geometric design of the operating equipment. Experienced suppliers, who have the necessary process engineering know-how as well as the required expertise in hygienic design, develop their machines and machine lines according to clear criteria. These include, for example, the following points:

- Material used
- Material combinations
- Geometry
- Connection technology
- Constructive details
- Components used
- Production engineering
- Surfaces and coatings.

The application of sanitary design principles allows a company to

access product zones easily, dismantle/clean and reassemble equipment in a reasonable time frame. It is also important to predetermine whether wet, dry or a combination of wet and dry cleaning are the best methods for cleaning to prevent bacterial growth.

EVALUATION OF PROCEDURES

Experts in quality assurance and HACCP audits say that the most important question to be answered and evaluated is "How long can we run a process line before that line needs to be cleaned due to the potential for making unsafe food?" This is typically referred to as "critical" cleaning and is usually answered by visual inspection. A more scientific approach could include equipment swabs of product zones and adjacent areas, to see if indicator organisms can grow. Once the methods for

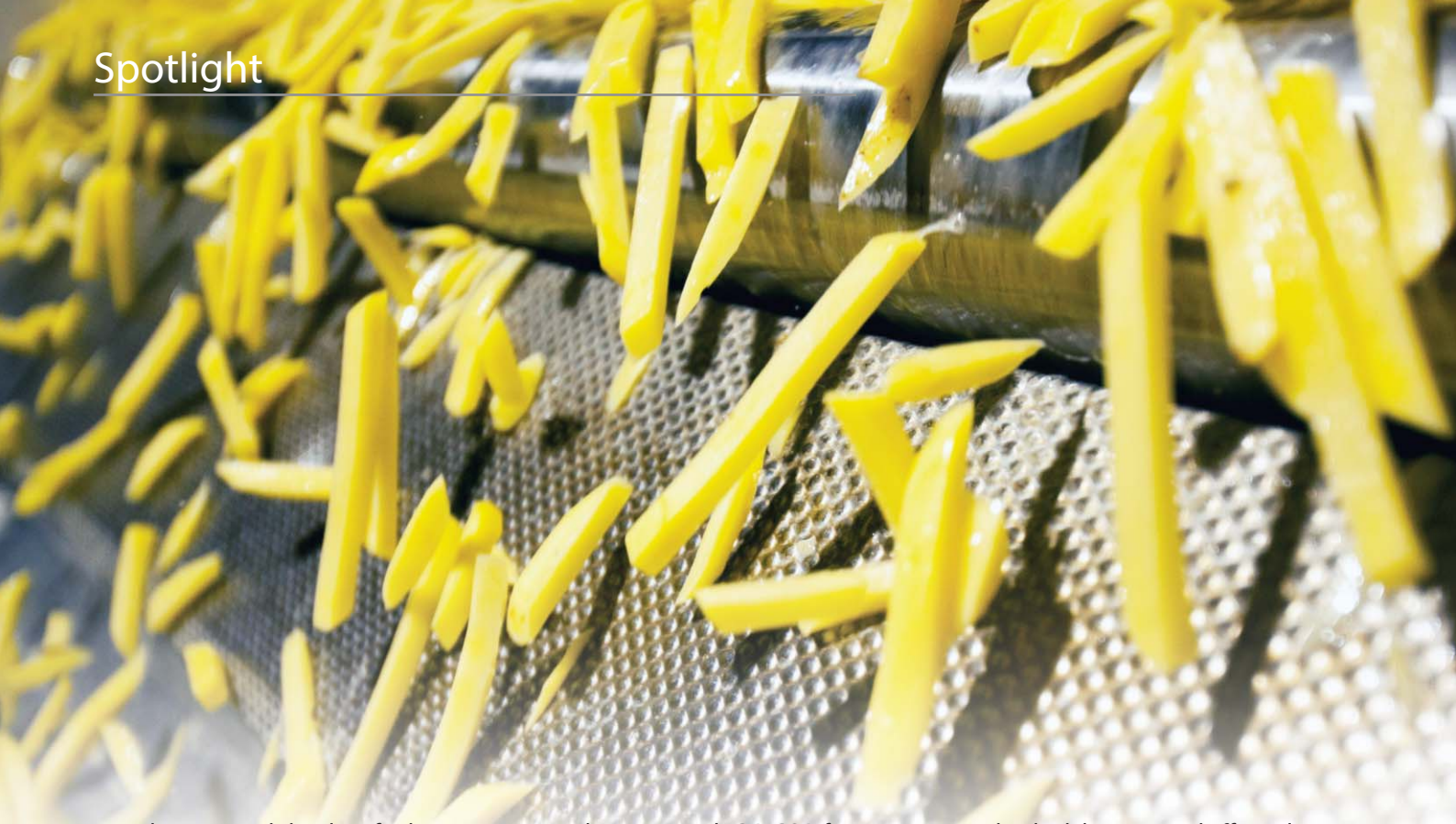


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cleaning and the data for bacteria growth are evaluated, the company can set cleaning frequencies and establish “best methods” for procedures. The effectiveness of a cleaning procedure can be done by visual inspection, but most companies also rely on product zone testing for indicator organisms. In the case of allergen changeover cleaning, they will use validated test kits for the protein residue. For critical cleaning assignments, best practices should be to evaluate the effectiveness of cleaning using validated test methods. Multiple methods are used in food processing facilities, which include dry versus wet cleaning to control bacteria growth, clean in place systems (CIP) and clean out of place (COP), where equipment is cleaned in a “wash down” room, i.e. disassembled, cleaned and reassembled. All facilities using “best practices” provide employee training when hazardous chemicals are used, while also ensuring the use of personal protective equipment (PPE) as required by the country’s regulatory requirements.

CLEANING AGENTS

The type and use of cleaning chemicals are dictated by the chemical/physical properties of the food residue being removed from the product contact surface, such as fat, oil, protein or carbohydrate. There are many different cleaning

applications, such as CIP, COP, foamers, gel applicators and/or manual cleaning with brushes and vacuums. The most important aspect of cleaning is wet versus dry cleaning and the possible effects of using water for cleaning that could allow for bacteria growth on product contact surfaces.

ULTRASONIC CLEANING TECHNOLOGY

Before using ultrasonic cleaning technology in its New Annan potato-processing plant (Plant 1) on Canada’s Prince Edward Island, the time and process required to maintain its technology was lengthy and cumbersome. Scales, shakers, vibrators, graders, baggers, open bag detectors, metal detectors, case packers, sortation conveyers, palatizers, wrappers, gear boxes, ceiling cooling units and stainless steel filters all require regular cleaning and repairs. Oil from the French fries clogs pivot points and other components, including parts that are more complicated to clean and maintain. Each of Plant 1’s 12 Ishida scales has 28 buckets (14 pool hoppers and 14 weigh hoppers). One bucket can take up to four hours of a skilled mechanic’s time every few months to disassemble, hand scrub each component, reassemble and replace the unit. Oil also can cause errors on the scales and other malfunctions, including errant fries in the machinery. Required repairs

used to be laborious and affected plant efficiency. Over time, it became clear to Chris Keough, packaging maintenance supervisor at Cavendish Farms’ New Annan plant, that considering an alternative cleaning process was in the company’s best interest.

The Ultrasonic system Omegasonics 33-gallon Pro Plus unit was the best solution, according to Keough, and was able to reduce cleaning time by more than 85%.

It used to take one skilled mechanic four hours to clean one of the plant’s Ishida bucket scales – from disassembly to reassembly. Now, a staff member, instead of a mechanic, is able to clean eight scales in four hours, spending only 30 to 60 minutes on each scale. Without any specialized training, a plant floor worker can put the scale into the ultrasonic unit, leave it largely unattended while the machine works, and go work on other projects.

“I can’t emphasize enough the amount of time it has freed up for my mechanic,” said Keough. “We can actually see the light at the end of the tunnel on our backlogged maintenance list. We’re running cleaner, better equipment and using fewer man hours.”

INCREASED PRODUCTIVITY

With less time spent on cleaning, old and new components are getting deep cleaned on a regular

basis, increasing their performance and efficiency. When critical pieces of machinery are involved, cleanliness makes a significant difference in productivity. For example, vibrators used on the plant's processing line each contain fibers with only .02 inches between them. Over time, these spaces fill up with dirt and grime, which deadens their vibration and ultimately decreases production efficiency. These fibers and the spaces between them were nearly impossible to clean by hand. Ultrasonic cavitation bubbles reach these intricate crevices and thoroughly clean the delicate fibers and all adjoining components, while decreasing maintenance time and increasing productivity.



LOOKING AHEAD

The most important aspect of cleaning is to know that your cleaning procedures and frequencies for cleaning are scientifically correct to produce safe

food. This means that cleaning methods must be validated using in-process product and/or equipment swabs for indicator organisms. Environmental

pathogen testing for companies producing ready to eat (RTE) products are performed as required by the country's regulatory and customer requirements. •



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European Market Outlook for 2022

Even with the uncertainty of the COVID-19 pandemic still hovering over industry players' heads, Union Nationale des Producteurs de Pommes de Terre (UNPT) experts say, demand for processed potato-based products has resumed and manufacturers are on a positive development trajectory, in terms of both volumes and areas.

by Tudor Vintiloiu

Concerning the potato production costs, like those of other agricultural productions, they have been rising sharply for several months. "There is nothing to say what will happen in spring when the potatoes are planted: energy, fuels, fertilizers, consumables are subject to price increases to unprecedented levels," the UNPT representatives added. The same forecast shows that the price of agricultural production (cereals, oilseeds, etc.) has 'rarely been so high' and will lead producers to arbitrate their rotations

based on unusual parameters. "Competition between different cultures will be intense. The increase of the areas sown with potatoes, which seemed likely to continue for several years, will certainly be affected by this new situation," the organization representatives continued. They say that the conditions of the 2022 contracts are currently being unveiled and show increases that are insufficient to make up for the reductions applied to the prices of contracts in 2021 (despite increases in production costs

already at the time) and the increases in charges in 2022. UNPT's analysts consider that those above-mentioned increases should be between EUR+30 and EUR+40 per ton, to allow producers to respond positively to the questions and issues proposed. "In addition to these price increases, the contracts will have to incorporate elements that secure the producer and support him in his (growing) production risk-taking. At a time when the EGAlim 2 law will see the light of day, this is undoubtedly the opportunity for all players in the sector to find a fair balance for its suppliers and customers," the experts concluded.



TWO-WAY TRADE MODEL BETWEEN THE EU AND THE UK

The avoidance of strict lockdowns in most European countries is seen as a positive factor for markets at the beginning of 2022, according a recent Irish Farmers' Association (IFA) report.

Although difficulties with transport are reported, exports to the East appear to be increasing, particularly from Germany.

"Retail trade is steady, albeit much slower than this period last year when level five restrictions were in place. Trade for the processing sector is variable at present but it is hoped this will improve with considerations that restrictions will ease shortly. Peeling material has been quoted in the region of EUR200 per ton. The availability of seed potato is a huge concern for growers at present and lobbying efforts continue to devise a two-way model for trade between the EU and the UK," the same report shows.

INPUT COSTS, A 'HUGE CONCERN' FOR THE SPUD FARMERS

Input costs for the upcoming season continue to be a huge concern for the spud farmers, IFA analysts admitted.

"Input costs for 2021 had already increased significantly but the signs for 2022 are hugely concerning,"



they also mentioned. Retail demand was vigorous over the Christmas period and continues to be 'steady' as we set into what would be a typically quieter time of year. There was continued turmoil for the foodservice sector over the festive season as restaurants were forced to shut earlier.

ROMAIN COOLS: LOGISTICS STILL PRESENT A PROBLEM

In a recent conversation with Romain Cools, President/CEO of World Potato Congress, he revealed he shares the same concern over the increased input prices for the 2022 season: "It's the case with fertilizers - which have been purchased by British farmers in the US instead of Europe, as they were cheaper there, and also the case with sprout suppressants and other plant protection products. On top of everything, energy has become more expensive."

According to Cools, contract prices

in Europe have gone up, and also free market prices for this season are increasing due to storage costs and uncertainty of storage quality because of wet harvesting conditions. All over the world logistics still present a problem (increased prices for container transport, delays because of lack of staff (due to quarantine measures), etc. This is resulting in shortages and unique situations such as the recent import of frozen potato products in Japan by plane.

"Covid is still influencing markets and daily life. Though optimism is increasing as the omicron variant doesn't seem to result into serious illness and expectations are that the figures will go down rapidly (as is being illustrated in the UK where the top has been reached)," Cools added. In spite of this, experts agree, that for the time being, the pandemic scenario will continue to cause market trade disruption well into 2022. •



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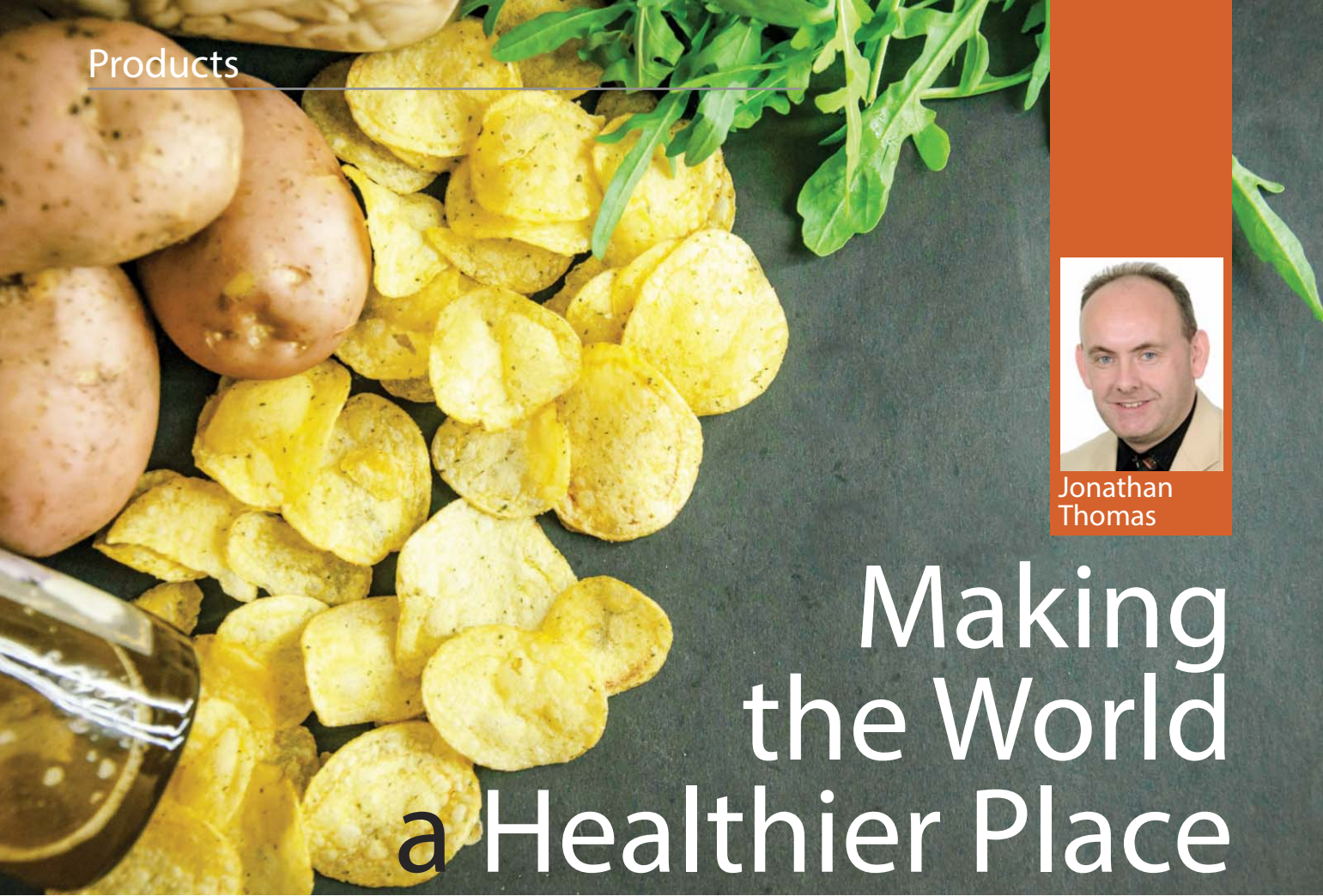


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Jonathan Thomas

Making the World a Healthier Place

The pandemic should result in even greater focus upon better-for-you (BFY) potato products. Pressure from the health lobby remains stronger than ever, with the result that manufacturers of potato products continue to improve the nutritional profiles of their respective portfolios.

by Jonathan Thomas

Many of the products now appearing within sectors such as potato crisps/chips and frozen potato products (e.g. French fries) carry some form of health claim, such as low or reduced sodium, saturated fats and/or calories, as well as being free from artificial additives and ingredients and products manufactured using a baking (rather than frying) process. The coming years are also likely to witness the arrival of more products targeted at people following specific diets, such as gluten-free and vegetarian/vegan. With many potato-based foods continually linked with poor diets, this trend is unlikely to abate any time soon. In contrast, the pandemic is expected to result in increased demand for healthier or better-for-you (BFY) foods, with obesity rates remaining under the spotlight. Obese consumers have accounted for a disproportionately high percentage

of worldwide Covid-19 victims, with research in 2020 having found that people with the highest BMI (i.e. over 40) were 92 times more likely to die from the virus than those with a BMI ranking of between 18.5 and 25. Meanwhile, separate research from the World Obesity Federation discovered a strong link between the prevalence of overweight and/or obese people and high numbers of Covid-19 related deaths. Of the 2.5 million worldwide deaths resulting from the virus as of the end of February 2021, a significant 2.2 million (i.e. 88%) of these were attributed to countries where over half of the population were ranked as overweight or obese. A US study carried out at roughly the same time by the Centers for Disease Control and Prevention found that 78% of people who had been hospitalized, needed the assistance of a ventilator or died from the virus were classed as overweight or obese.

These rather startling statistics suggest that health concerns will remain at the top of the agenda for the global food industry in the post-pandemic world. However, certain research undertaken since the first half of 2021 in various parts of the western world (e.g. Western Europe and the US) suggests that, for many consumers, lockdown periods coincided with periods of lower physical activity and overeating, therefore potentially storing up trouble for the future. It remains to be seen over the next few years to what extent these trends add to the public health burden and whether this will translate into punitive measures from the authorities against certain foods in the form of 'sin taxes.' In the UK, for example, the National Food Strategy has issued calls for increased taxes on sugar and salt used in processed foods, which, if implemented, would raise the price of potato crisps at the retail level.

As far as potato-based products are concerned, many consumers continue to actively seek out foods offering some form of health benefit at least, if not added functional health ingredients. However, it should be remembered that consumers are rarely if ever willing to sacrifice taste and flavor on the altar of health. This is especially true for potato-based snacks, many of which are eaten as a treat or a form of personal indulgence.

REDUCED FAT & SALT

The market for BFY potato products continues to undergo a transformation. In the past, the choice of healthy products in sectors such as potato crisps and chips was rather limited, confined to low-fat varieties. Many of the products offered to consumers were perceived as bland and lacking in taste, factors which largely negated any health benefits that might have been offered. However, as the food industry has developed and consumers have become more sophisticated, the range of health benefits and attributes has widened. While reduced levels of saturated fats and salt remains a key offering for many of the BFY products on the market at present, manufacturers have also embraced the clean label trend via the removal of many artificial ingredients and additives from their portfolios. Within the potato-based snacks sector, the emergence of alternative methods of cooking – such as baking snacks, instead of frying – has also developed the category and resulted in a higher quality product.

As consumer awareness of the importance of healthy eating continues to increase in many western countries, the prospects for the market for BFY potato products appear favorable. In the US, the 2021 version of the Food & Health Survey undertaken by the International Food Information Council (IFIC) found evidence of a change in perceptions of healthy foods. Rather than focusing upon what has been taken out of foods, as was the case in the past, consumers now appear to be more interested in what foods contain. According to the 2021 survey, 27% of respondents defined healthy by the presence of components such as fruit and vegetables, up from 17% five years previously. In contrast, the percentage of respondents that defined healthy foods by the absence of ingredients such as sugar, salt, saturated fats, etc. dropped from 35% to 25% during this time. Awareness of healthy foods also appears to be on the rise in the US. The survey also found that 73% were confident in their ability to choose healthy foods, while 46% were fully aware of the new version of the Dietary Guidelines for Americans (DGA) published towards the end of 2020, following years of research and scientific review. The percentage of US consumers aware of dietary guidelines from the authorities has increased from 41% in 2020 and 23% ten years earlier. One of the many recommendations in the 2020-2025 version in the DGA is limiting intake of foods high in added sugar, sodium and saturated fats. Sodium intake should be no more than 2,300mg per day, while intake of saturated fats

should be restricted to less than 10% of overall calories. Most of the world's leading suppliers of potato snacks compete within the market for products with reduced levels of sodium and saturated fats. The range of market leader PepsiCo includes Lay's Baked Original Potato Crisps, which contain 65% less fat than standard varieties, as well as Kettle Cooked crisps (which contain 40% less fat) and Lightly Salted (with 50% less sodium). In the UK, the company's Walkers Oven Baked crisps contain 50% less fat than standard crisps. Manufacturers of frozen potato products are also placing greater emphasis on nutritional improvements. In the UK, McCain's range includes Lighter Home Chips, which contain 30% less fat than standard varieties, as well as Rustic Skin On Chips – these have a fat content of just 3% and around 100 fewer calories per serving compared with conventional products. Leaving the skin on potatoes has been shown to retain many of the vitamins found under the skin, with the result that consumers often perceive them as a healthier option. Companies operating within this sector have also introduced products based on sweet potatoes within the last few years. These also carry strong links with health credentials, since sweet potatoes have a lower glycemic index (GI) than regular potatoes – the sugar is broken down more slowly, leaving consumers feeling fuller for longer and therefore less inclined to snack. In addition to having lower calorie levels than their standard counterparts, sweet potatoes have also been identified as a good source





of various vitamins and minerals, as well as antioxidants and fiber, the latter of which is linked with digestive health. Another potential health benefit of sweet potatoes is the fact that they are rich in beta-carotene, which carries links with ocular health.

FREE FROM POTATO PRODUCTS

Free from products have made increasing headway in many sectors of the food industry in recent years. Much of this growth can be attributed to the rising perception that free from foods are intrinsically healthier than their more standard counterparts, with the result that penetration is increasing even amongst those who do not have a diagnosed food allergy or intolerance.

One sector of the free from foods market, which is particularly relevant to the potato products industry, is gluten-free. The global market for gluten-free foods continues to grow, although estimates of its size vary according to definition. According to a recent report from Facts and Factors, the global market is set to increase from USD22bn in 2019 to USD36bn by 2026, with annual growth averaging over 8%. Globally, around 1% of the population is believed to suffer from coeliac disease, although many are not formally diagnosed. Gluten intolerance has many symptoms, notable examples of which include abdominal pain, digestive disorders, chronic fatigue and numbness in the extremities. In regional terms, around 0.9% of the

US population is believed to suffer from coeliac disease, a figure which compares with 0.8% for Europe and 0.6% in Asia. Intolerance of gluten is especially high in Finland, estimated at 2.4% of the total population. Between 60% and 70% of those formally diagnosed with coeliac disease are female. As has been stated previously, gluten-free diets have become increasingly popular with consumers who have not been formally diagnosed with coeliac disease, for various health-related reasons. Avoidance of gluten forms a central part of some of the diets currently in vogue amongst western consumers – for example, the Paleo diet restricts bread and all grains to help reduce consumption of processed foods, while the Keto diet recommends cutting out bread and wheat-based products from the diet to restrict intake of carbohydrates. Around 30% of US consumers are now believed to be making a conscious effort to avoid gluten intake, while gluten-free dishes appear on more than a quarter of US restaurant menus.

Since potatoes are gluten-free, products such as crisps, chips and frozen varieties would appear to be well placed to capitalize on this continue demand. However, many products within these sectors are not labeled as gluten-free, for reasons such as cross-contamination, or the fact that coatings or other ingredients contain gluten extracts. Nevertheless, many leading manufacturers of potato crisps and chips have made a

conscious effort to remove gluten from their products, with the result that leading brands such as Pringles, Kettle, Cape Cod and Tyrrells are now promoted on a gluten-free platform. The situation is a little less clear elsewhere in the market. Many of the potato-based snacks in the range of US market leader Frito-Lay are either free from gluten or gluten ingredients, spanning the Lay's and Ruffles brands. Within the children's foods market, Intersnack's Pom-Bear range is marketed on a gluten-free platform. In instances such as these, gluten-free appears as alongside several other health claims, examples of which include free from artificial additives ingredients, organic and low in fat, salt and/or calories. However, gluten-free specialist Dr Schär also competes in the market via Curvies, potato-based snacks similar in appearance and texture to Pringles. These are sold in countries such as the UK and Ireland and are available in Original and BBQ flavors. Gluten-free products are also becoming more apparent within the global market for frozen potato products. The UK range of global market leader McCain, for example, contains a specific example targeted at those following a gluten-free diet, namely Gluten-Free Home Chips. According to the company, other products within its range – such as Ready Baked Jackets, Quick Cook French Fries, Naked Oven Chips, Crispy Skin On Fries and Naked Skin On Chips – also conform to gluten-free requirements. McCain's rivals within the category are also placing greater emphasis upon the needs of consumers following a gluten-free diet. Many of the products within the range of Ore-Ida (which forms part of Kraft Heinz) are promoted as gluten-free, examples of which include Golden Steak Fries, Diced Hash Brown Potatoes and Mini Tater Tots. A similar situation exists for Lamb Weston, although it should be stressed that not all its potato-based products are strictly marketed as gluten-free. As is the case with potato crisps and chips, manufacturers of frozen potato products appear to be moving towards clean label ingredients, with gluten-free just one of numerous health claims made. ●



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Picking Favorites: Bulk vs. Boxed Storage

Safeguarding potatoes while storing them for months is challenging. During storage it's necessary to keep up the quality and hold back the sprouting as long as necessary and prevent tuber diseases and pests from developing. In addition to storing conditions, crop protection products and sprout inhibitors are used. Potato producers are still looking for new developments to support these demands.

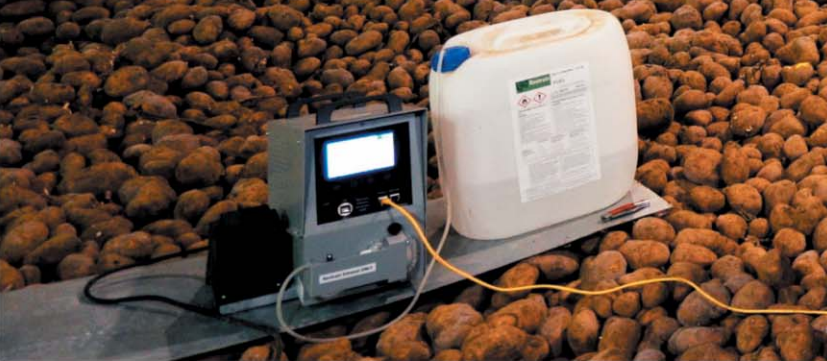
**by Tudor Vintiloiu
and Ionel Vaduva**

Supplying high-quality potatoes that have been harvested and handled gently, are of a consistent size and shape, and offer a good shelf life requires significant care and attention throughout the potato handling process. In the fresh produce industry, prices are dictated by the amount and quality of supply, and therefore effective potato storage practices are vital to maximize returns on crop yield in line with demand. Worldwide, almost two-thirds of processing potatoes are stockpiled in bulk stores, with the remainder in boxes, while tubers destined for the fresh sector are almost exclusively stored in boxes. Market experts also say that bulk storage is particularly suitable for storing potatoes in large quantities. Pressure ventilation through a grooved floor is optimal, because of its homogeneity. In addition, by combining this ventilation with

cooling, heating, and humidification systems, any climatic situation can be achieved to properly dry, cure, and store potatoes. On the other hand, there has been much talk recently about the benefits of storing potatoes in boxes as an alternative to bulk storage. Many companies are now working with growers to integrate specialized box processing equipment within their current potato handling operations to bring added value and better stock control for growers willing to embrace the benefits and shift their current storage practices. Industrial storage-houses store potatoes for processing in late autumn, winter and spring. The capacity of industrial storage-houses depends on the kind and size of potato manufacture. Potatoes in bulk are kept in individual chambers or halls. The halls and chambers are provided with flat or inclined floors. The floor

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inclination angle is usually 15° and the storage bins are inclined at an angle of around 42°, enabling unloading operations. The most common height of the piles is 3,5-4,0 m. When the pile is formed on 1 m² of the floor and its height is 4 m, then the pile will contain approximately 2.6 tons of potatoes. Potatoes are more frequently stored in pallet-boxes than in sacks. The pallet-boxes vary in construction and cubic content. Some of them have crated bottoms and sides; in others only the bottoms are crated. The bottoms and sides can be either movable or stable. The framework is made either of wood or metal. The advantage of storage in pallet-boxes is easy access to the bulk of potatoes and better utilization of space in comparison with bulk storage. The pallet-boxes reaching

5.5 m in height, i.e. five pallet-boxes mounted upon 1 m² contain 3 tons of potatoes. The advantage of storing potatoes in the pallet-boxes is the possibility of keeping small portions of different potato varieties and also the avoidance of severe damage and bruising as well as infection. The disadvantage of such storage is the high cost of pallet boxes. Large manufacturing plants, such as starch factories, alcohol distilleries and feed producers, prefer bulk potato storage, enabling hydro-mechanical unloading.

WHAT WORKS FOR EACH CUSTOMER

Tolsma-Grisnich has a long experience with developing storage techniques for potatoes. Their experts have developed some of the most modern technologies for storing in

bulk or boxes. The combination of technology and storage advice results in the highest possible storage efficiency for customers. Besides bulk storage, Tolsma specializes in box storage with forced ventilation (drying or suction wall), and space ventilation systems.

Tolsma also develops innovative storage technology for automated climate control. The advanced, user-friendly process technology controls, fans, hatches, heaters, and mechanical cooling based on the temperature, RH, and CO₂ concentration measured, resulting in the best possible storage climate. "Our company and solutions are different than others because we focus on energy management and what is actually going on with the product while it is in storage," said a company representative recently. At the same time, Dim Jan de Visser, CEO of Tolsma-Grisnich added: "With energy-efficient EC fans, designed and produced in-house by our research and development department, the company wants to achieve the highest efficiency and the lowest production costs for their customers. The Grisnich product range is ready to respond to the more complex demands coming from the processing industry, whereby the engineering of total systems (concept) will meet the trends towards scale enlargement, professionalization, and digitalization."

POTATO BOX STORAGE EFFICIENCY

Tong Engineering, another well-known potato handling equipment manufacturer, exports its wide range of advanced systems worldwide. The company produces a range of market-leading box handling equipment as well as advanced potato bulk loading, cleaning, and grading equipment for effective handling of the crop before storage.

Not long ago, Tong's experts tackled the pros and cons issue of bulk versus boxed potato storage. In this respect, one of the company's representatives spoke about the US bulk crop storage approach. "In the United States, box storage is

"In the United States, box storage is a much less common storage technique than bulk crop storage."

Charlie Rich, export sales manager for Tong Engineering

a much less common storage technique than bulk crop storage," Charlie Rich, export sales manager for Tong Engineering explained. "This is quite opposite of the way potatoes are commonly stored in the UK and Europe, and there are some very strong reasons why box storage not only makes potato storage more efficient, but also helps to add value to the stored crop."

Other market experts say that box stores provide a series of advantages such as potatoes can be taken into and out of storage quickly, and the tubers are subject to only slight mechanical stress as the boxes are filled and emptied just once. Among other advantages is the fact that boxes are practical and easy to use, the batches are separated exactly, the grading is flexible, the individual containers are accessible at all times, the existing buildings can be used, and the potatoes are well ventilated.

In the case of bulk storage, the tubers are filled from the hopper of the harvester onto the loading area of the transport vehicle and transferred to a section store. There the tubers are tipped out and stored as bulk product.

The box filling has on the other hand two available options: indirect and direct box filling. In the indirect box filling option, the lifted potatoes are collected on the harvester in a

"Our company and solutions are different than others because we focus on energy management and what is actually going on with the product while it is in storage."

Dim Jan de Visser, CEO of Tolsma-Grisnich

hopper, then filled into the large box on the adjacent transport vehicle and transported into the storage hall.

When it comes to direct box filling, the potatoes are filled into boxes while still on the harvester, then the box is transferred from the harvester onto the transport vehicle and taken into the storage hall.

IN THE US, LOOSE STORAGE OF POTATOES IS A LESS COSTLY SOLUTION

As mentioned before, in the US, one of the most important spud producing country in the world, the experts say that many farmers still prefer loose storage of potatoes.

As to be expected, the highest process costs result from the direct

box filling of containers. The reasons for this are the higher initial costs and the slightly higher labor time required. However, bulk storage and indirect box filling result in approximately equal costs. The cost calculation does not account for the advantage that the quality of tubers from the direct box filling is better than that of the tubers of the other two methods. It is up to the distributor to obtain higher earnings due to better product quality.

Dim Jan de Visser, CEO of the Tolsma-Grisnich Group, explained that one of the reasons he thinks US growers don't move to boxes is because of the opinion they're too expensive. This, he mentioned, is because they were being shipped from Europe at double the price.

De Visser added that US packers will need better filling systems in order to keep up with the higher volumes. ●



FRUIT LOGISTICA: "You Will Be Able to Do the Best Business!"

The restarting of attendance trade fairs has been a success and preparations for FRUIT LOGISTICA 2022 are forging ahead. With exhibitors from over 80 countries, FRUIT LOGISTICA will once again present the entire global value chain of the fresh fruit industry in April 2022. **POTATO PROCESSING INTERNATIONAL** has asked **FRUIT LOGISTICA's Director, Kai Mangelberger**, to share some insights regarding the upcoming event.

by Tudor Vintiloiu

Can you tell us what visitors can expect from this edition of Fruit Logistica?

The feedback from the fresh fruit industry is clear: We asked our exhibitors and trade visitors, and an overwhelming majority wants FRUIT LOGISTICA 2022 to be a physical event here in

Berlin. That's why this year's motto is "Meet onsite again". FRUIT LOGISTICA is the leading trade show for the global fresh produce business. From 5 to 7 April, you will meet the best in the global fresh produce trade. You will receive the best insights, get to know the best innovations and benefit from the best networking opportunities. Simply put, you will be able to do the best business!

What are some of the novelties this edition presents?

This year for the first time there will be a new format specifically for digital topics that's called Smart Agri. Digital technology has

already changed agriculture. One example: drones equipped with cameras and measuring technology provide farmers with precise information about problem areas in the field. This allows targeted intervention where it is needed. In this way, digital technology can help save fertilizer, water and machinery and avoid crop failures. At FRUIT LOGISTICA, we will have a dedicated area in hall 5.1 for this important and future-oriented topic, where companies will present digital solutions for pest control, AI technology for estimating fruit yields, intelligent reports and reliable forecasts, decision support systems, flying autonomous robots for fruit harvesting and much more.





How has the volatility of the COVID-19 situation influenced this edition of the trade show in terms of attendance, exhibitors, logistics, etc.?

Planning security became a more important phrase this year than ever before. The new postponement of FRUIT LOGISTICA as an in-person event was a great challenge. We are very grateful to our customers for their positive encouragement of this decision. We expect that the situation will begin to alleviate in February or March. The new dates make it possible to hold a FRUIT LOGISTICA that will pay off for our international guests and exhibitors. We look forward to hosting people from around the world once more under better circumstances. As of now the level of international diversity is very positive with companies from 80 countries. Based on the current registration rate, we're expecting over 2,000 exhibitors for FRUIT LOGISTICA 2022.

How will the potato sector be represented in terms of products and exhibitors?

Nearly 200 exhibiting companies are directly linked to the potato business offering fresh products, technical systems, services or logistics. FRUIT LOGISTICA maps the entire supply chain: from producer to the point of sale. A good example of this is the company Böhmer, which produces and sells potatoes but also offers packaging solutions for potatoes. Parmentine from France, VLAM from Belgium and the association Porbatata from Portugal will also be there, just to name a few. In addition, various suppliers of machinery and solutions for processing, packaging and storage of potatoes will be present in the technology and machinery section.

What are some of the highlights from this year's program?

This year we will focus on the major pillars of the program while the event is taking place: The Fresh Produce Forum, Future Lab, Logistics Hub, Tech Stage and the Start-Up Day on the third day of

“This year for the first time there will be a new format specifically for digital topics that’s called Smart Agri. Digital technology has already changed agriculture.”

Kai Mangelberger, director FRUIT LOGISTICA

the fair. And, not to forget, the FRUIT LOGISTICA Innovation Award, which will once again present the ten most exciting innovations of the past year. Although we will meet onsite and in person, we have added some virtual aspects to the event: FRUIT LOGISTICA ONLINE which offers more features and includes streaming of the supporting program. But the focus remains onsite.

What are three aspects that would encourage visitors to attend this edition of Fruit Logistica?

The three aspects that are so attractive to trade visitors are the internationality, the networking and the fact that the entire value chain is represented. FRUIT

LOGISTICA enables trade visitors to meet the entire industry in one place and make new contacts. Nowhere else will you find such a large number of products and exhibitors from all over the world.

Anything else for everyone to look forward to?

Rita Biserni, member of our International Advisory Board, has summarized the answer to this question very nicely: Over the last two years we have learnt that holding international meetings while sitting at the office desk is possible. But we have also learned that nothing can replace the pleasure and the tangibility of holding a face-to-face conversation. With this in mind, I am particularly looking forward to welcoming you to Berlin in April. •



Potato Expo 2022

Potato Expo 2022 was the first in-person meeting of the U.S. and international potato industry in two years and was held on January 5-6 in Anaheim, California. Overcoming national airline and pandemic disruptions, Potato Expo 2022 provided industry attendees the opportunity to network, reconnect, and learn about the latest services and technologies to improve their businesses.

by Tudor Vintiloiu



schedule their time to their maximum advantage. Additionally, and back by popular demand, Potato Talks @ The Expo Stage featured topical discussions about the latest and greatest technologies and products the industry had to offer. This January, the Expo Hall was a hive of activity, featuring the Iron Potato Chef Cook-off hosted by Food Network personality and chef Simon Majumdar, multiple happy hours and receptions, a silent and live auction to benefit the Potato LEAF foundation, and spaces to sit down with clients and business partners over meals or a cup of coffee. Additionally, the Expo Hall featured companies from across North America and the world staffed with product and service experts eager to share their knowledge and help solve growers' problems. More than 140 companies and organizations signed up to exhibit at Potato Expo 2022's record-breaking 100,000 square feet of premier trade show space, as exhibitors were aware there was no better place than Potato Expo to network, introduce new products and services, talk directly with their target audience members, and reconnect with customers in person. •

Speaking about the event, Britt Raybould of Raybould Brothers Farms, St. Anthony, Idaho, Chair of Potato Expo 2022 gave a warm welcome to the industry coming together once again. "To me, Potato Expo has always felt like the official start to a new year, and this year's event was a celebration like no other! It's a fitting return after our last time in Las Vegas two years ago. While we've done our best during that time to maintain our relationships and go about our business, meeting together in person offers a different and memorable experience. The Potato Expo is an important event for the industry. It's the place where we can find new solutions for our farms, learn new trends to stay competitive, meet up with friends, and connect with our buyers and suppliers. This year was no different - except the opportunities to come together and do business which were even

greater," he said. Having hosted Potato Expo for over 14 years, NPC created an event that provided attendees an opportunity to discover new ideas, products, and services. This year's Expo offered growers a one-stop-shop to get the most current information on a wide variety of industry issues and trends. Attendees had dozens of Breakout Sessions at The Innovation Hub to choose from, allowing them to



2022 FEATURE PLANNING

1 JANUARY/FEBRUARY

Ad closing 17.01/Publishing 28.01



Key Exhibitors Road Map and Event Agenda

Processes

Conveying systems and belts
Pre-cleaning, washing, de-stoning

Expert View

Conveyors and the transfer of potato products
Remote maintenance and customer service
Cutting technology advancements

Spotlight

Cleaning and sanitation

Markets

Western Europe

Products

Better for You potato products

Ingredients

Lowering salt content

Storage Special

Handling potatoes to & from storage
Bulk vs. boxed storage

Trade shows: Potato Expo | Jan 6-7, Fruit Logistica | Feb 9-11,
International Potato Technology Expo | 24-25 Feb

2 MARCH/APRIL

Ad closing 14.03/Publishing 25.03



Key Exhibitors Road Map and Event Agenda

Processes

Sorting
Process monitoring
Seasoning & coating

Expert View

Optical sorting - increasing yields
Automation - ensuring a reliable and flexible production flow

Spotlight

Smart production & Industry 4.0

Markets

Eastern Europe

Products

Potato-based snacks, drinks and innovations

Ingredients

Flavors and seasonings for chips and fries

Storage Special

Automated climate control
Potato monitoring & quality assurance

Trade shows: Anuga FoodTec | 26-29 Apr

3 MAY/JUNE

Ad closing 09.05/Publishing 20.05



Key Exhibitors Road Map and Event Agenda

Processes

Cutting, peeling, slicing
Energy and water saving
Oil filtration systems & de-fattening

Expert View

Precision in cutting equipment
Sustainability in production

Spotlight

Waste management

Markets

North America

Products

Local vs. international tastes in potato snacks

Ingredients

Frying oils

Storage Special

Power saving and sustainability
Storage design and construction

Trade shows: WPC | May 30-June 02, Europat Congress | 29 - 30 May,
Snackex | 06-07 June

4 JULY/AUGUST

Ad closing 18.07/Publishing 29.07

Processes

Blanching, frying
Forming and extruding

Expert View

Latest frying technology developments
PEF applications and advantages

Spotlight

Increasing efficiency in potato processing

Markets

South America

Products

Potato chips flavors, textures and trends

Ingredients

Batters, coatings

Storage Special

Sprout suppressants in storage
Sensors and data gathering

Trade shows: Potato Association of America Annual Meeting | July,
Potato Europe | 6-8 September

5 SEPTEMBER/OCTOBER

Ad closing 05.09/Publishing 16.09

Processes

Cooling and freezing
Dehydrating

Expert View

IQF freezing for French fries
Drying - innovation in selt and drum dryers

Spotlight

Traceability along the potato value chain

Markets

APAC/ANZAC

Products

Frozen French fries in retail & foodservice

Storage Special

Refrigeration and long-term storage
Disease Management

6 NOVEMBER/DECEMBER

Ad closing 07.11/Publishing 18.11

Processes

Turnkey projects
PEF technology

Expert View

Complete lines for processing
Conveying systems & inspection tables
Batch vs. continuous frying

Spotlight

Increasing production capacity/Future-proofing processing operation

Markets

Global market predictions for 2023

Products

Flakes, pellets and mashed potatoes

Ingredients

The future of potato snacks 2023

Storage Special

Storage challenges and cost-saving solutions
Store preparation and hygiene



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