POTATO PROCESSING
INTERNATIONAL

Supporting the potato industry worldwide

Issue 5 • Volume 30 • 2022

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Traceability Systems Stand for Authenticity and Safety

Process
Freezing Quality is Determined by Technical Refinement

Storage
Cold Storage Solutions Fend Off Crop Quality Issues

Products
Every Day A Fry-day

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The Potato Industry Reconvenes in Kortrijk

Tudor Vintiloiu - Editor in chief
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At the end of November, INTERPOM will once more be the ultimate trade platform for any professional interested in the latest market developments, price trends and innovations. The theme chosen by the organizers of the event, namely 'Towards a healthy growth', is intended to emphasize the responsibility incumbent on every link in the chain to work together towards sustainable, responsible and consequently healthy growth. 'Healthy growth' is all about cultivation methods, land use, growing in a socially responsible way, but also about sustainable transport and processing, autonomous energy use and sustainable water management.
Combine all this with the super healthy character of the potato as a food bomb and you get the whole picture!
INTERPOM will present a particularly comprehensive and specific range of products, machines and services for the entire chain.
Innovative exhibitors will also receive special attention by having their relevant pioneering solutions showcased if they provide significant added value to further improve the sustainability and professionalization of the potato sector. After all, innovation, creativity and technological progress are the main keys to tackle crisis situations.

Innovation, creativity and technological progress are the main keys to tackle crisis situations.

Over 270 exhibitors from 15 countries have already confirmed their participation. This means that well over a month before the official opening, the fair is already almost sold out.
Participation in international trade shows such as this is critical for the industry and players all sizes have long waited for the COVID related restrictions to be lifted so that normal interaction could resume. Attendance provides exhibitors with a plethora of opportunities, and the benefits of having an international presence are enormous. Trade shows are an inexpensive way for small and medium-sized businesses, in particular, to gain access to international markets. They are a one-of-a-kind communication tool that will continue to play an important role in the marketing mix in the future. ●

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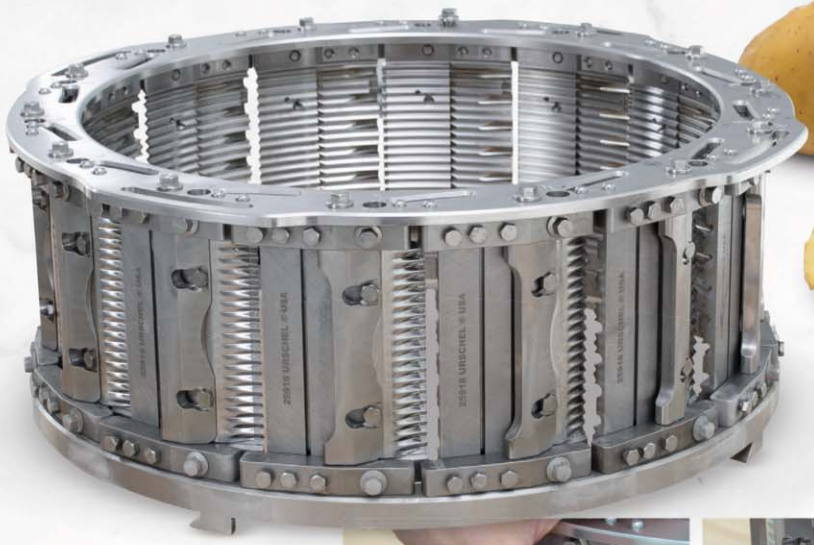

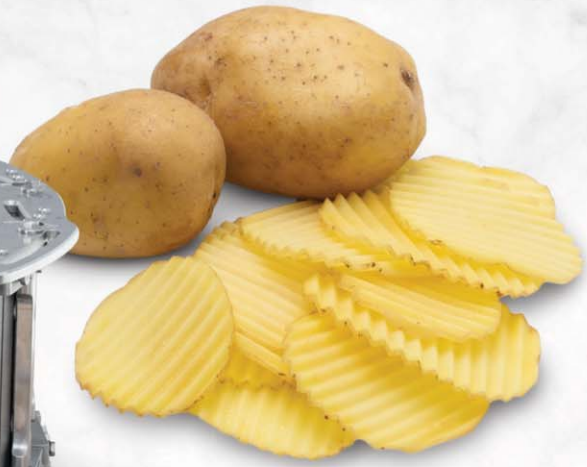

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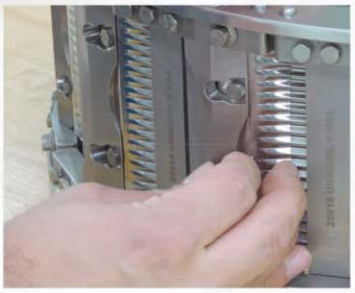

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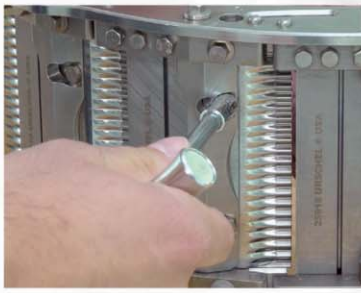

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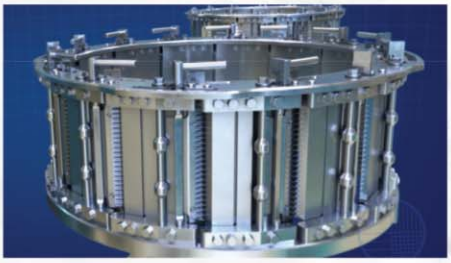

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™SlideLocc trademark pending.

South African Frozen French Fries Are 'In Short Supply' Due to Tariffs

Recently, a warning has been issued by a South African (ZA) French fry distributor that the country's stocks of fries are 'in short supply', underlining the greater need for government engagement on product import tariffs.

In July, South Africa's International Trade Administration Commission (ITAC) imposed new import tariffs of up to 23.06% on frozen French fries from Belgium and up to 104.52% on frozen fries from the Netherlands, with German suppliers being hit the hardest with new duties of 181.05%. Local fry producers, however, have been issuing communications to warn clients of impending shortages since May.

Despite receiving tariff benefits for the better part of a decade, market experts believe that there has not been enough investment in expanding production capacity and ensuring that there is an adequate supply of frozen French fries for the market's needs.

In the short term, the experts believe that the ZA government should consider lifting anti-dumping duties and engage more openly with importers and businesses to discuss constructive solutions to South Africa's supply chain constraints.

Bio-based Thermoplastic for Lay's Potato Chips Display Stands

Israel-based UBQ Materials, a developer of advanced materials made from unsorted household waste, announced that PepsiCo will launch eco-friendly Lay's potato chips display stands throughout Europe, made in part with UBQ bio-based thermoplastic that will replace conventional oil-based plastics.

Following the success of PepsiCo's pilot incorporating UBQ in shipping pallets, the company is expanding its collaboration with UBQ across the supply chain, according to Israel 21C. In the same respect, PepsiCo has also enlarged the initial logistics pilot, ordering 30,000 more UBQ-made shipping pallets. Along with five other solutions innovators, UBQ Materials was recently selected to advance PepsiCo's sustainability agenda. UBQ Materials' waste-based thermoplastic reduces landfill waste, prevents emissions, and takes us towards circularity, which is why we are working towards scaling the use of UBQ globally.

Hedge Fund Giant Tiger Global Finds Stability in Potatoes

Tiger Global Management LLC has opened a USD12.8m position in shares of the potato and frozen-goods maker Eagle, Idaho-based Lamb Weston, reversing its focus on innovative, high-growth tech names.

Lamb Weston is one of the world's largest producers of frozen potato products. It was owned by ConAgra until it was bounced off and listed in 2016, and it is now worth nearly USD12bn.

Despite a stated commitment to "Potatovation", which Lamb Weston defines as a "team ideology" that encompasses product development and operations, the company may appear to be an unusual investment for a major hedge fund dominated by fancy tech bets, according to the FT experts.

The latest 13F regulatory file number 028-10100 filed on August 15, 2022, clearly shows a 179,784 shares acquisition from Tiger Global.

Raw Idaho Grown Taters to Become 'Tatorade Sports Milk'

Beverage Marketing USA and Nautilus Mineral Waters of America plan to produce and market a "Tatorade" line of potato-based milk beverages. The juice of raw Idaho-grown potatoes will be used to make the new probiotic electrolyte-rich sports beverages.

Idaho potatoes are high in important vitamins and minerals that benefit the human body, the most important of which is catalase, a naturally occurring enzyme in potatoes that aids athletic performance.

The natural potato enzymes found in Tatorade Sports Milk act as a super-catalyst for converting hydrogen peroxide into water and oxygen. The raw potato juice-derived catalase is a particularly efficient enzyme. Catalase has one of the highest turnover numbers of all known enzymes; some 40,000,000 molecules per second. This high rate shows the importance of the enzyme's capability for detoxifying hydrogen peroxide and preventing the formation of carbon dioxide bubbles in the blood, making for extended athletic performance.

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Key Technology to Debut its Reversible Zephyr Conveyor

At Pack Expo (booth S-3547), Key Technology will debut its reversible Zephyr conveyor. Zephyr gently moves the product with a minimal bounce to protect the product quality and reduce noise, achieving higher capacities than other horizontal-motion conveyors.

The reversible Zephyr, which can now flow in either direction, increases production line versatility while improving sanitation and lowering maintenance.

The reversible Zephyr is suitable for frozen bulk foods like potato chips/crisps, nuts, and cereals, along with dry products like potato chips/crisps, nuts, and cereals. The unique motion profile of Zephyr gently slides and conveys product with no segregation or stratification, reducing product damage and coating loss such as seasoning, batter, and certain types of oil. The Zephyr provides up to twice the throughput of other horizontal-motion conveyors while keeping noise levels at or below 75 decibels.

The reversible Zephyr, when integrated with pneumatic controls on the production floor, allows processors to change the direction of product flow with the push of a button or automatically if fully integrated with the line. Reversible Zephyr can be configured to split a single product stream between two machines or to divert a single stream to two different downstream production lines to produce different products.

McCain Foods Ltd. Sold Its Russian Potato Production Facility

McCain Foods Ltd. of Canada has completed its exit from Russia by selling its Russian potato production facility.

McCain Foods began construction on the plant in 2021, at a cost of USD212 million, about 200 kilometers south of Moscow in the Tula oblast (administrative division).

McCain halted construction on Feb. 24 when Russian forces invaded Ukraine and announced two weeks later it was abandoning the project. The company also ended shipments to Russian markets and says it has no plans to resume. McCain said it had completed a sale of the facility to a local buyer.

"This brings an end to McCain operations in Russia. Our thoughts continue to be with those affected by this ongoing crisis," Charlie Angelakos, vice-president of global external affairs and sustainability at McCain, said in a statement. McCain added that the Russian market made up less than 5% of its USD11bn global annual sales.

Urschel Acquires Jifco and Plans Expansion

Urschel Laboratories, Inc. officially acquired JIFCO Products, Inc., and the resulting business has been renamed Urschel South.

All previous JIFCO employees are now Urschel employees. JIFCO specializes in CNC machining services to produce top-quality, American-made parts. The company is one of the few precision machine shops in the manufacturing prototype industry.

"We welcome all of our new Urschel South employees into the Urschel family," Rick Urschel, president/CEO of Urschel Laboratories, Inc. said.

Urschel South is currently located on Brown Street in Valparaiso, Indiana. The business will remain at that location until the expansion at Urschel headquarters, slated to begin sometime in the fourth quarter, has been completed. The plant expansion will add approximately 115,000 sq. ft. of manufacturing space. This expansion will be the second largest construction project undertaken by the company since building the current new campus in 2015 at 1200 Cutting Edge Drive in Chesterton, Indiana. Current square footage stands at over 410,000 sq. ft.

Novel Business Acquisition by Patatas Meléndez

Patatas Meléndez has recently purchased the Galician company Patatas M. Prado Mazaira, a benchmark in the Galician potato sector.

"Galicia has enormous wealth as an agricultural region. Being able to offer Galician potatoes to our current customers is a great milestone for the company", Javier Meléndez, CEO of Patatas Meléndez explained, cited by El Dia de Valladolid. The Valladolid company will continue to rely on the entire Patatas Prado team.

"With the acquisition of Patatas Prado, Patatas Meléndez will continue to respect this philosophy, which is why it has decided to maintain the entire organization and structure of the company", states a recent press release. With this business movement, the company will be able to have the Protected Geographical Indication (PGI) and include the Galician potato in its product portfolio, which is characterized by having an excellent flavor and texture.

Patatas Meléndez signed a purchase agreement with Integral Potato SL, a company in the fresh potato sector based in Medina del Campo, in 2020.

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INTERPOM'22

Towards a Healthy Growth

The 2022 edition of INTERPOM will soon open its doors to visitors and, in preparation, we've gathered some useful information from the organizers in order to help attendees make the most out of their tour of Kortijk Expo. INTERPOM is the most specialized indoor trade fair for the potato sector in Europe where the whole chain is represented. On the show floor, visitors can meet growers, contractors, processors, packers, buyers and traders of fresh and processed potatoes from all corners of Europe – and increasingly, from other continents as well.

Despite the unusual context in which the (postponed) edition took place in November 2021, the general consensus is that it was a successful reunion between the most important representatives from the entire industry. Looking towards the 2022 edition, Potato Processing International reached out to Annick Pycarelle, Exhibition Manager to learn about the upcoming novelties.

By Tudor Vintiloiu

Can you tell us what are your expectations from this edition of Interpom?
First of all, it will be a happy reunion with the complete value chain represented this year: all major potato related brands are back (again) after a quite complex and postponed 'COVID' edition in 2021. INTERPOM 2022 will soon be fully booked with more than 300 exhibitors. Everybody in the potato business is looking forward to it.
We are living in challenging times with climate change, water scarcity, fertilizer shortages, labor shortage and rising costs of raw materials and energy. These themes will certainly be the topics of discussion on the booths.
November is always the perfect timing (after the harvesting of the potatoes) to start the new contract negotiations. INTERPOM is the perfect place for these negotiations and to be informed about the latest market evolutions.

What are some of the novelties this edition brings for visitors?
Innovation is key to achieve healthy, sustainable growth and to be able to tackle the current challenges, such as climate change, water scarcity, fertilizer shortages, labor shortage and rising costs of raw materials and energy. With the help of an independent group of experts, INTERPOM will select a number of must-see innovations developed by exhibitors that not only provide added value for users, but also benefit the entire potato chain. These innovations will be announced in November and will be highlighted at the fair via a special route called the INNOVATION TOUR, as well as via all available digital channels.

What is the return rate for exhibitors and what benefits do you offer those that return? What can newcomers expect?
The 'COVID' edition has shaken up the field of participants a bit but Kortrijk Xpo has professionally and pragmatically found a way around this. This year the interest is just as good as before COVID and that causes some puzzling, but the exhibitors are very understanding and we try to take everyone's wishes into account as much as possible. So far the return rate (from past exhibitors) is over 75% and I expect to finish at 80% or 83% return rate, which is quite a lot! We also have quite some newcomers as well in the meantime. And indeed: why wouldn't you want to participate in the biggest indoor potato fair where the whole sector is present?

Can you give us some details regarding the seminar program?
The program will be compiled by Belgapom and will highlight themes such as manure management, water use and drought issues, inflation and rising prices of raw materials, agro-ecology, potato disease management and the latest developments in automation and precision agriculture.

This year's theme is 'Towards a healthy growth'. Why do you think this is important in today's economic environment, and what does it mean for growers/processors?
The choice of the theme is intended to emphasize the responsibility incumbent on every link in the chain to work together towards sustainable, responsible and consequently healthy growth. 'Healthy growth' is all about cultivation methods, land use, growing in a socially responsible way, but also about sustainable transport and processing, autonomous energy use and sustainable water management. Combine all this with the super healthy character of the potato as a food bomb and you get the whole picture!
It is important to work together for the future of our business in order to stay competitive on the international market. Every link in the chain – also both growers and processors - has to be aware of this.

Anything else for everyone to look forward to?
INTERPOM is always a happy (indoor!) reunion of the professional potato community! It is the perfect place to establish or maintain contacts with colleagues and suppliers from home and abroad since everyone in the potato business is present. So this will be a very exciting meeting place again for every professional involved in the chain!
This year, there will also be the usual 'Belgapom Potato Network event' on the eve of the opening of INTERPOM on Saturday 26th November. This is the ideal networking opportunity to meet with all players of the European potato market. This festively opening of INTERPOM includes a walking dinner. You can attend this event if you register via Belgapom. Ask for more information via belgapom@fvphouse.be. •

Elea Technology GmbH - Pulsed Electric Field systems

Stand 224
www.elea-technology.com

With over 200 installed systems worldwide, Elea is the leading supplier of Pulsed Electric Field (PEF) systems to the food, beverage, and scientific sectors. PEF is able to restructure raw materials such as tubers, providing new product opportunities and enhancing process optimization for snack processing such as chips and French fry manufacturing. Benefits: water and energy savings, higher yield, smoother cut, less breakage, reduced oil uptake, better colour and improved quality. Elea provides a range of PEF Advantage Belt systems up to 70 t/h, but also a flexible solution for businesses looking for an output up to 7,5 t/h.

FAM Stumabo - Industrial Food Cutting Solutions

Hall 1 - Stand 199
www.fam.be | www.stumabo.com

FAM focuses on developing industrial cutting machines for the food industry, by providing customers with the solutions they need for the cutting, slicing and dicing of vegetables, potato chips and French fries. Over the past 60 years, we established long-lasting close cooperation with highly influential companies, customers and partners. We are present in all continents, with customer experience centers, stocks, and service. A big contributing factor to our quality is the close partnership with our sister company Stumabo International, manufacturer of precision knives for the food industry.

Heat and Control - Complete Turnkey Solutions

Booth 1106
www.heatandcontrol.com

Advancing food processing technology with creativity, passion, and unmatched expertise at a global scale. For over 70 years across food industries and applications, Heat and Control's specialised equipment solutions have set the standard for yield, efficiency, and safety. Offering complete turnkey solutions featuring integration from start to finish ensures full line efficiency and performance. **Food Processing:** From raw produce preparation and value-adding to frying, cooking, seasoning, and coating. **Product Handling:** Maintain efficient production at optimal capacity. Smart design and line management that achieves accurate feed, accumulation, and distribution flow. Includes conveyors, elevators, and proportional feeding systems. **Potato products:** Producing the world's best tasting potato chips, French fries and formed potato products, our systems are the workhorses of the industry.

Insort GmbH

Hall 1 Booth 174
www.insort.at

Insort GmbH is one of the worldwide leading companies providing real time sorting, monitoring and analysing solutions based on Chemical Imaging Technology (CIT®) for the food processing industry. Our expertise combines the latest optical sensor systems and digital signal processing with mechanic and electronic machine design specially developed to fulfil highest food processing standards. The machines branded as the "Sherlock" family set a new benchmark in performance and food safety. This year at Interpom, the latest machine development with breakthrough technologies for the potato industry will be presented. Convince yourself of the performance of the Sherlock machines by visiting our stand at Interpom.

INTERPOM'22

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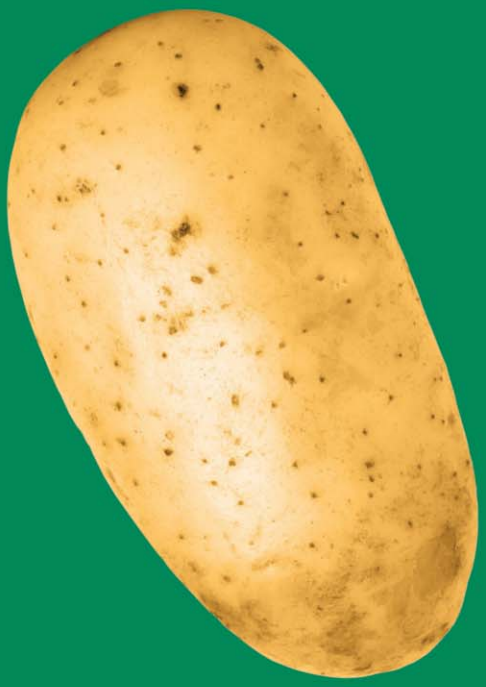

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27, 28 & 29 NOV

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Key Technology

Hall Ramblers Booth 257

www.key.net

Key Technology is a global leader in the design and manufacture of automation systems including digital sorters, conveyors and other processing equipment. Applying processing knowledge and application expertise, Key helps customers in the food processing and other industries improve quality, increase yield and reduce cost. Key manufactures its products in Walla Walla, Washington, Redmond, Oregon, USA, and in Beusichem, the Netherlands. Key offers customer demonstration and testing services at five locations including Walla Walla and Beusichem as well as Hasselt, Belgium; Sacramento, California and Melbourne, Australia. Key is a Duravant Company.

Kiremko

Hall 1 Booth 191

www.kiremko.com / www.idahosteel.com

At this edition of Interpom, Kiremko and Idaho Steel celebrate 25 years of partnership. Discover how this partnership benefits your potato processing! As a world leader in the manufacture of process lines for the potato processing industry, we focus on product development, continuous improvement, innovation, sustainable technology and co-operation to ensure, we give added value to every customer. We innovate, design, manufacture and install advanced processing lines worldwide. We specialize in lines to process potatoes into French fries, potato chips, potato flakes, formed potato products such as hash browns, pellet snacks, fresh cut and pre-cooked potato products and other potato specialties.

Pulsemaster - Pulsed Electric Field Systems

Ramblas Booth R30

www.pulsemaster.us

As the #1 supplier of Pulsed Electric Field systems for better French fries and potato chips, the innovative Dutch-German company Pulsemaster continues to specialize in Pulsed Electric Field processing. Pulsemaster offers PEF-systems with capacities up to 80 tons per hour. With Pulsemaster PEF-systems huge improvements can be achieved in the production process of chips and French fries. Pulsemaster aims to apply this innovative technology - also known as electroporation - in the widest range of applications in the food industry. PEF technology meets the industry's need for natural and clean processes.

Raytec Vision SpA

Booth 246

www.raytecvision.com

Raytec Vision is a leading expert in optical sorting technology for food as well as X-Ray inspection for packaged products, providing a wide range of machines for safety and quality control. Raytec Vision SpA was founded in 2001 in Parma, considered the main center of the Italian food valley. The company's mission is aimed at achieving the highest quality standards in the food sector with the support of innovative machines, such as optical sorters for raw materials and for processed products, as well as x-ray inspection machines for packaged and unpackaged products.

Restrain

Booth 277

www.restrain.eu.com

Our story begins in 1999, when we set out to find a safe, effective way to prevent sprouting in potatoes. Or research led us to conducting trials with ethylene which were so successful the Restrain company was born. Ethylene is a natural gas that leaves no chemical residue. Today the Restrain system is used to treat more than 1.5 million tons of seed, table and processing potatoes in 38 countries worldwide. Restrain is the natural replacement for CIPC in potato storages.

Rosenqvist Food Technologies AB

Experts in drying technology, coating lines and frying systems

Booth 164

www.rosenqvists.com

Based in southern Sweden, is a specialist on thermal treatment with focus on drying and frying. Rosenqvist Food Technologies AB has more than 45 years of experience supplying complete processing lines for French fries and potato specialities. The main focus for our company is the development, design, manufacturing and supply of belt dryers and frying systems for normal and coated fries, potato specialities, etc. We help help clients produce great tasting French Fries or other potato specialties. Rosenqvist Food Technologies AB is an expert in drying technology, coating lines, optimal frying systems, oil flow and oil quality.

Tolsma - Grisnich

Booth 122

www.tolsmagrisnich.com

Tolsma-Grisnich develops innovative total solutions for the entire process of handling, storage, processing, and packaging of agricultural products. We provide smart total solutions for growers, processors and industrial packers of agricultural products and have a rich history of more than fifty years. Besides our machinery and installations, we provide reliable storage advice, but also advice and provide information about optimal maintenance of the grading installation. Thus, customers gain insight into running costs and maintenance costs. Throughout the lifetime of the installation, our customers can rely on the advice and solutions provided by our specialists.

TOMRA Food, Key Solutions for Potato Processors

Hall 1 - Stand 116

www.tomra.com/food

TOMRA Food will be present at INTERPOM promoting its sensor-based solutions to make sure Every Potato Counts and help businesses improve returns, gain operational efficiencies, and ensure a safe food supply. TOMRA Food will promote its TOMRA 3A for unwashed potatoes. Equipped with high-resolution cameras and NIR it can identify zero-value green potatoes and distinguish between the crop and foreign material, operating at high capacity, often at a rate of 100 Tn/h. It is so effective that it removes 95% of rocks, floating stones, dirt clods, and corn cob, plus 85% of other typical foreign materials.

Tummers Food Processing Solutions

Booth 184

www.tummers.nl

Tummers Food Processing Solutions is a leading manufacturer of equipment for the food processing industry. The company's flexible offer consists of machines for various processes, such as washing, peeling, cutting, flakes and fry production. Tummers combines the latest technologies to build not only efficient and reliable, but also hygienic equipment. All of their solutions are aimed at sustainable processing. This is not only to be seen in the way their machines work, but also in their approach when finding new solutions. During engineering for example, they strive to an optimum combination of raw material and energy consumption, together with as little waste as possible. Tummers was founded in 1976 as a machine building company and maintenance partner for the local potato industry. Being a Dutch family company, they always operates with common sense. Therefore, despite their impressive technologies, they state that "Not machines, but people are the heart of Tummers".

Urschel Cutting Technology

Stand 134

www.urschel.com

Visit Urschel to see the latest in food cutting technology. Explore the new M VersaPro™ (MVP) Dicer that excels in the versatile processing of proteins from alternatives to traditional. Discover the E TranSlicer® Cutter, DiversaCut 2110A® and Sprint 2® Dicers all featuring a conveyor discharge to facilitate dispensing into totes. Also on display, the TranSlicer 2520® Cutter specializing in fresh cut salad processing, now available with an HMI for added benefits. In addition, the Comitrol® Processor Model 3600 milling machine and the capable CC-DL shredder will also be featured.

Freezing Quality is Determined by Technical Refinement

Quick freezing is at present the only process whereby virtually all the properties of most foodstuffs can be preserved. The important feature of this process is ultra-rapid freezing to very low temperatures (-30°C to - 40°C) designed to halt the activities of the microorganisms that cause decay and deteriorate foodstuffs.

By Tudor Vintiloiu

In IQF, each piece is frozen individually using a technique of fluidization resulting in short freezing times of only 10 to 12 minutes, which would otherwise take at least 3 to 4 hours or even more in a blast freezer. This results into better texture and there is no lump/ block formation and the product is free flowing. One does not have to thaw or defrost the whole packet to take out only a portion, and the rest will remain frozen till required again.

MARKET OPPORTUNITIES

According to a recent Brandessence Market Research study, "The frozen potato market size has experienced a huge growth in the last few years with the potato products experiencing an incline of a tremendous growth rate and will be continuing to do so in the coming years. These sales are going to go further high in the domain of frozen fries considering the wider popularity it has in the accompaniment of the other fast foods. Furthermore, there is a demand for other potato snacks like slices, dices, and wedges, which has been growing. The COVID-19 pandemic has seen the market getting a good amount of growth unlike the rest of the markets and that is because of the lockdowns being imposed and the people looking for simpler options to get their food supplies. Frozen potato chips and other products like nuggets are growing in demand due to this."
The growth in this category is driven by a combination of urbanization, rising income, and the lowering of tariffs from the World Trade Organization on export and import of the frozen potatoes. Overall, the global frozen potato market will see growth in the coming years as better and more nutritional products come up, the experts added.

INCREASED SAFETY AND HYGIENE

Emerging technologies and customer expectations for safe, hygienic solutions in food production have consistently pushed **FPS Food Process Solutions** to find the best answers for their clients' demands. FPS' recirculating Clean-in-Place (CIP) systems with pasteurization mitigate the risk of contamination before packaging. Furthermore, the company's Spiral Immersion SystemTM (SISTM) can cook, chill, and freeze products within sealed vacuum bags to ensure no exposure to the environment throughout the processing cycle. FPS explores innovative technologies to meet customer needs, and among these innovations are the first of its kind, 1.8m Spiral Freezer and the Spiral Immersion SystemTM (SISTM).
In collaboration with Intralox, FPS developed the 1.8m wide belt spiral freezer to match larger processing lines. For food processors, this is a critical factor in being able to produce higher output. The SISTM was developed to not only produce better

quality food products but could also save on cost, time, and energy. Additionally, FPS uses mechanical freezing, which is a system where the air is passed through a tube and fin evaporator inside the equipment. Refrigerants such as ammonia, freon, or CO2 can be used depending on customer preference, explains Greg Sheridan, sales manager, FPS.

"We especially circuit each evaporator to the required refrigeration load to maximize efficiency. Various methods of feeding the refrigerant are utilized depending on application and temperature requirements as well as overall refrigeration plant design. We can use recirculated systems in the bottom or top-fed liquid, flooded systems, and direct expansion. We discuss the various options with our customer and refrigeration contractor to ensure they know the operational requirements and efficiency of each system."

"We look at each application to determine which type of freezing equipment is right for the job. All of our equipment is designed to provide even airflow at optimum velocity across all product zones."

FPS

When it comes to improving performance and efficiency, the ability to condition the product appropriately in the most efficient process is the company's goal. "We look at each application to determine which type of freezing equipment is right for the job. All of our equipment is designed to provide even airflow at optimum velocity across all product

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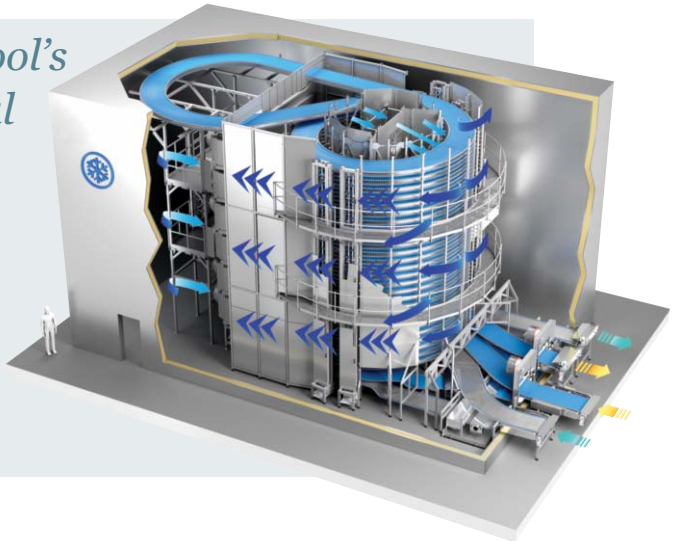
zones. This ensures we remove heat consistently for all belt widths and freezer sizes, to give consistent output and quality. We design the equipment to minimize airflow restriction through product zones, internal structure, and through the coil and fan assemblies. Using external motors, plug fans, eliminating coil defrost louvers, and using square tube patterns in our coils all contribute to substantial reductions in energy. Reducing restrictions while ensuring airflow across all product zones power consumption. Freezing faster reduces yield loss improving product quality and improves throughput. Reduced freezer power consumption reduces energy costs and reduces the refrigeration power which offers further energy savings."
Each freezer is custom engineered and built to specific customer site requirements. This allows FPS to tailor the delivery to facilitate the installation appropriate to each site and to match up with existing equipment.

ENSURING GREATER PRODUCTIVITY

System customization, hygiene, ease of maintenance, operation in a continuous cycle, and high-quality freezing - these are the five winning assets of **Tecnopool**'s spiral freezing systems, according to company representatives. Tecnopool's patented T-Worth technology ensures greater productivity and increased customer satisfaction in the field of frozen foods. Unlike conventional drum-based spirals, the T-Worth belt installed in Tecnopool's freezing systems is driven externally by a motor that is smaller in size and needs less power. This does not affect the system's performance, as friction is reduced and the belt is driven instead of being pushed, offering considerable advantages right from the design stage. Every producer has a specific set of requirements, depending on the type of product, volumes, and logistics. By eliminating the need for a central pivot, T-Worth technology increases the system's flexibility, enabling it to combine two separate lines with same-level entry and exit.
"The customer can study and test this system directly in the Test Room set up in our facilities in San Giorgio in Bosco (Padua). Here, Tecnopool's specialized technicians and technologists will explain the characteristics of our freezing spirals and tailor them to the customer's needs," representatives add. Another distinctive feature of Tecnopool's freezing systems is the use of horizontal airflows that guarantee excellent freezing quality. The T-Worth system allows cold air to flow over the product, under the product, and throughout the spiral at a rate of up to 3 meters per second. This characteristic is essential as it ensures excellent, rapid freezing while preserving the product's flavor and organoleptic properties.
Once in operation, every system must then be kept clean and in good repair. Tecnopool's technology offers further substantial advantages in these two strategic aspects of food processing. The entry of humid external air is limited by air cutting tools placed at the inlet and outlet ends of the belt to reduce frosting and maintain the high efficiency of the evaporators.
"Moreover, for more than ten years now, Tecnopool has been using sequential defrosting evaporators that can be defrosted individually while the others continue operating, thus preserving the internal temperature of the cabinet and the effectiveness of the freezing process. This method allows the system to run in a continuous cycle, 24/7. The absence of a drum-based drive system for the T-Worth belt also allows easy access to every part of the freezing system, thus facilitating sanitization and achievement of the hygiene standards required by law for the food industry. Finally, easy access to internal spaces also guarantees another important competitive advantage, that is, simpler and faster maintenance, without the need to disassemble parts to access the area required. Every maintenance operation can be carried out from the outside of the spiral, thus also facilitating visual inspections," company representatives concluded. •

"Another distinctive feature of Tecnopool's freezing systems is the use of horizontal airflows that guarantee excellent freezing quality. This characteristic is essential as it ensures rapid freezing while preserving the product's flavor and organoleptic properties."
Tecnopool



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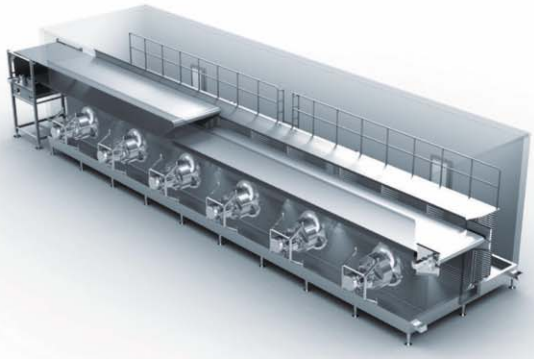

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Seasoning Systems for Potato Products: Advantages of the Continuous Process

The two main types of processing for producing potato chips are continuous and batch. Batch processing is the simpler, the more traditional, and the more common process. This is when all the ingredients are combined in a large container, processed, and packaged for distribution after the desired recipe has been achieved for the entire batch. Because all of the ingredients are mixed together and processed at the same time, the operator can ensure that the entire final batch of product meets quality standards before packaging.

By Heat and Control

Continuous processing, as the name implies, involves an unending stream of ingredients that is mixed together, processed, and then packaged for distribution. At any given time, the product can be found at different stages of completion. Just as there is a steady stream of raw ingredients being added and processed, there is steady stream of final product being packaged.

Continuous processing is much more efficient than batch processing because there is little downtime between batches, providing a higher volume of products in a shorter period. It is also less labor-intensive because it requires fewer people to operate. Continuous processing is a popular option for larger-scale operations.

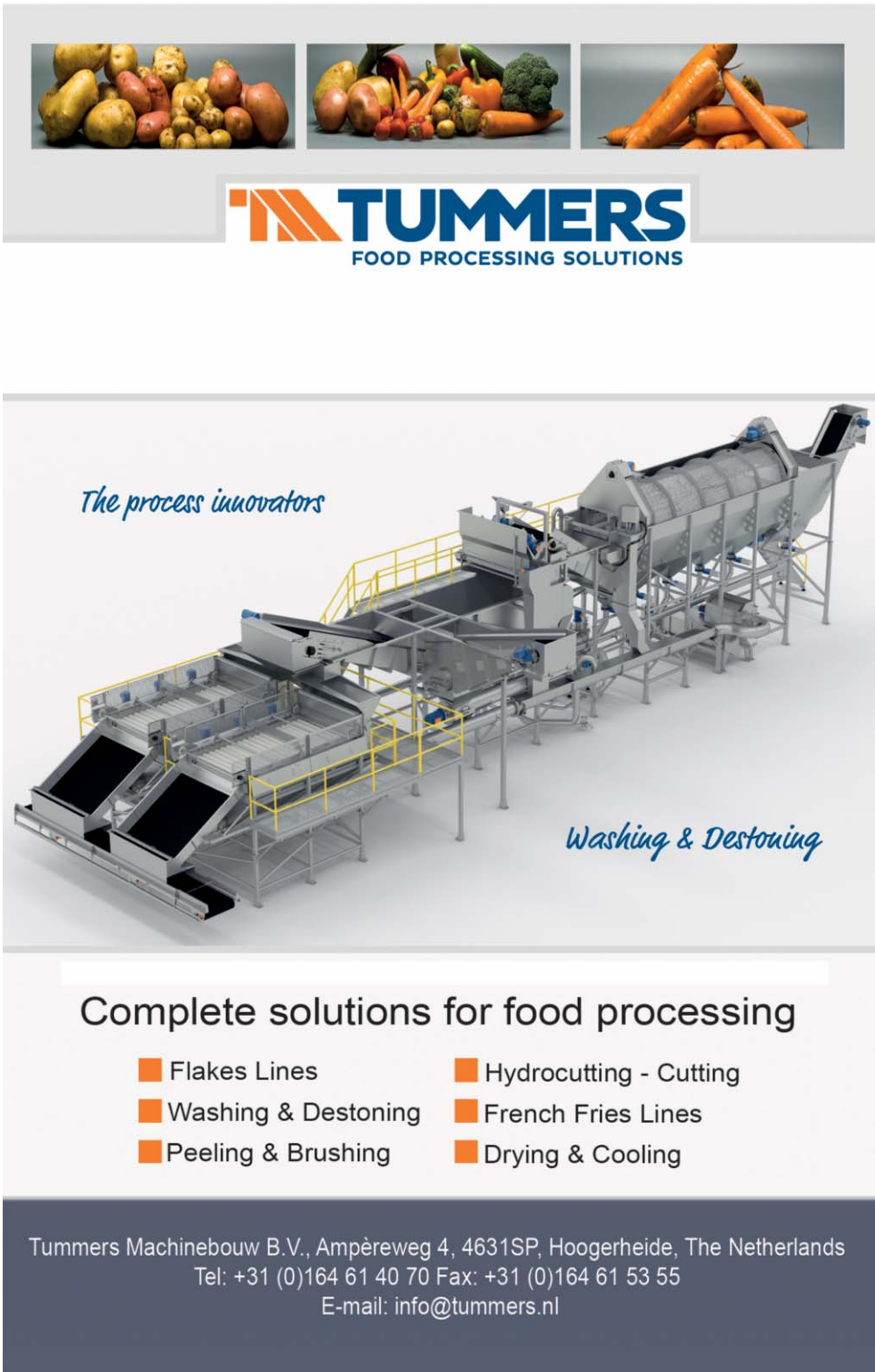
CONVEYING SYSTEMS

Likewise, there are two main types of conveyors: vibratory and horizontal motion. Vibratory conveyors, sometimes referred to as shakers, were the first sanitary conveyors more than 50 years ago and are used in the potato world, both for chips and for fries. Vibratory conveyors move product forward by bouncing/shaking it. Different magnitudes of amplitude (vertical lift) and frequency (forward pitches) produce different product travel rates. Because they bounce/shake product, vibratory conveyors can be used effectively to help separate product pieces and spread product across pan width. Horizontal motion conveyors, like the Heat and Control FastBack introduced, 25 years ago, have rocketed in popularity, supplanting vibratory conveyors as the number one technology for finished product. Horizontal motion conveyors convey with a slow forward and fast back motion that gently glides the product down the pan. This smooth motion virtually eliminates product breakage and cracking; does not shake off coatings, breadings, or seasonings; and minimizes buildup of seasonings, oil, and other coatings, reducing downtime needed for cleaning. In addition to being the preferred conveying type for finished products, horizontal motion conveyors now have extremely fast travel rates, have reversing capability and are being used increasingly in the processing area for laning, sizing and other processes. Heat and Control pioneered horizontal motion

conveyors and continues to pioneer the way for others in the industry. Accumulation, the ability to temporarily hold product back when packaging requires less product, plays a critical role in overall line efficiency. Heat and Control has developed several methods based on individual plant layouts and processing requirements to provide extremely gentle handling. One example is the patented SwitchBack accumulation method which gently accumulates and releases the right amount of product downstream to keep packaging lines running at peak efficiencies, while taking up a fraction of the space of most other systems, as well as providing easy wipe down stainless steel FastBack pans.
The Revolution Proportional Gate achieves the best packaging efficiencies while at the same time eliminating cross-contamination, product breakage, and safety concerns. Since its ground-breaking technology was introduced to the market, it has become the number one method for proportionally feeding packaging equipment, benefitting clients around the world with higher packaging efficiencies, inherently safe operation, elimination of cross contamination, and zero product breakage during open/close.

SEASONING SYSTEMS

On machine seasoning capability can provide superior results with seasoning capability and flexibility. If a food processor requires significant flexibility and greater seasoning changes, Heat and Control's Revolution on machine system (OMS) provides unparalleled seasoning accuracy and coverage and the highest packaging efficiencies available. More than six patented technologies come together to make the Revolution OMS the world's leader. Revolution's gates gently proportion the correct amount of product flow to each packaging station, optimizing seasoning and packaging performance. The exact amount of product is measured with the advanced WeighBack mass flow measuring system, and the correct amount of seasoning is dosed using their linear feed powder feeder system. Seasoning coverage is ensured in stop/start situations with the Dynamic Tumble drum (TD), which controls both the rotation and the forward motion of the product independently, always allowing the system to synchronize when the powder is applied to the product stream. Increased dwell time is achieved in the same overall length with the AccuFlavor TD design which keeps the FIFO method, critical for superior seasoning application accuracy while also improving overall dwell time and seasoning coverage. The overall result is superior overall system flexibility, with the ability to run multiple product flavors at the same time and reduced warehouse space. The Revolution system



improves fryer up times while achieving the tightest seasoning accuracy and the best overall seasoning coverage.

The OMS systems accurately measure the base product with patented WeighBack technology so the operator applies the right amount of seasoning based on the recipe with a load cell-controlled seasoning applicator. Heat and Control's patented TASC technology accurately measures the final results and automatically adjusts the application rate and reports the results to QC, so TASC not only improves the accuracy but also reduces testing labor and costs. Because seasoning is the most expensive part of the product, adding the right amount of it to the product is important; however, unless the seasoning is evenly applied, the product will not look nor taste correctly. The Heat and Controls OMS system excels again with three key technologies:

- The Dynamic TD action independently rotates the product while using the FastBack motion to convey the product forward with its gentle slow forward and fast back motion that keeps coatings, breadings, or seasonings on the product, allowing the system to synchronize the application of flavor with the product, even in stop start condition.
- The AccuFlavor TD nearly doubles the number of rotations of the product in the same overall length of space while also maintaining synchronization of seasoning to product.
- The Excalibur seasoning applicator applies the seasoning in a wide band rather than just a line curtain to further improve seasoning coverage.

Heat and Control's OMS also offers zero waste, a feature which ensures the very first chips that come out of the OMS system meet quality standards and are seasoned beautifully. This feature minimizes waste on a run.

BEST OPTION

The best option for potato processors depends on their criteria. We work with our clients to determine their current needs and their production goals to create a solution that incorporates their desired options within their factory space and their budget. During our seven decades as an industry leader, we have built an extensive knowledge bank and have developed a wealth of experience and expertise with access to production and technical support from a network of engineers, food technicians, field service technicians, skilled tradespeople, and support teams to provide food manufacturers with the ability to achieve their production goals. We are backend compatible and can upgrade/retrofit/reconfigure any existing equipment.

As a leader in processing in processing, coating, conveying, packaging, and inspection technologies, Heat and Control is continuously innovating. This includes optimizing our current products while simultaneously developing new solutions to meet the ever-changing product and package needs of our customers. •

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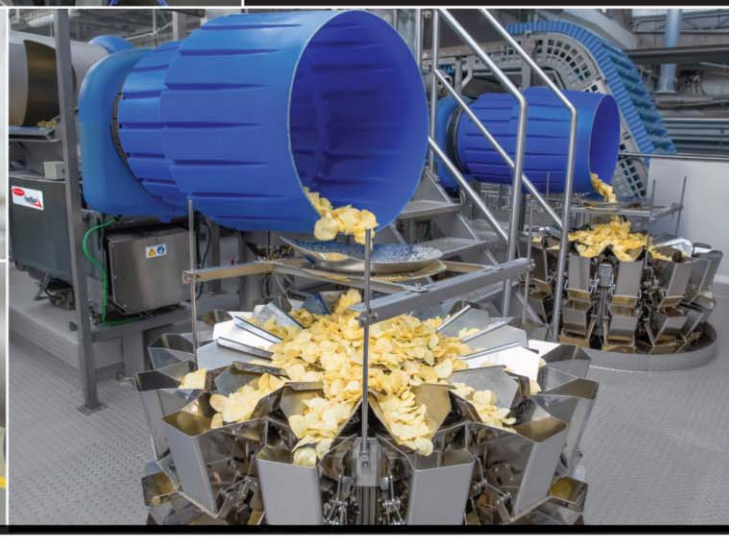

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Belgian Potato Concepts Shaping Up for Growth This Winter

Across at home and out of home channels, we know that inflation is sending both consumers and professional chefs to seek out value and quality. Looking to minimise prep time and food waste, there is a huge growth opportunity for quality chilled and frozen food. In fact, the global frozen food market is forecast to increase by USD250bn between 2021 and 2030[1].

In the UK alone, the frozen food category has grown by 13.5%[2] with over 400,000 more shoppers now purchasing frozen products and the average household spending an additional GBP25 a year on the category. Similarly, the chilled vegetable category is on the rise, having grown by 3.7% in 2021 vs 2020[3].

Processed potatoes, among the already high performing chilled and frozen food categories, are flourishing. With many years' experience, Belgian growers and potato processors are adept at responding to ever-changing potato trends and adapting their production to meet demand. Belgium is the world's No.1 exporter of processed potato products, with 90% of its production exported to over 100 countries.

The rich, fertile soil, mild climate and long-held potato growing traditions ensure Belgian potatoes are the perfect raw ingredient for innovative potato concepts, therefore retailers and hospitality buyers have an almost unlimited choice of standard and bespoke products, formats, coatings

[1] Astute Analytica, August 2022, Frozen Food Market; [2] Frozen Food Federation 2022, compared to pre-pandemic levels;
[3] Kantar Chilled Prepared Food Market Data 2019-2021

and packaging. High quality certified seed combined with scientific research and the latest technology deliver fluffy interiors, crispy or crunchy coatings and the unmistakable taste of Belgium.

AT-HOME OFFER A WINNER

Naturally, consumers will be feeling the pinch this autumn as the cost-of-living crisis impacts spend. It is expected that this will limit the number of consumers dining out. However, they will still be looking for high quality dishes to recreate at home. Therefore, the right chilled and frozen potato offer is essential for retailers in the second half of the year. Belgian producers have the diversity and quality to match the needs of grocery and independent retail customers. Retailers should be prepared for customers to be looking to trade-up as more people in the UK look to save money by celebrating big seasonal events such as Halloween, Bonfire Night, Christmas or even the World Cup, at home. Quick and convenient potato variants from Belgium such as fries, mashed potato, duchess, potato waffle, hash brown, wedges and sliced potatoes are ideal serves for entertaining at home.

There is a huge opportunity for retailers to put innovation into the chilled and frozen processed produce aisle. The lockdowns and working from home have caused people to cook more and explore at-home alternatives, which has resulted in consumption of innovative potato products to rise sharply. Offering customers in both the convenience and grocery channel a diverse range of products will no doubt translate into sales.

HELPING HOSPITALITY

On-trade businesses are facing a daunting winter season, squeezed from both consumer spend and rising energy costs, all the while a crisis in staffing continues. Business operators, buyers and chefs will be looking for time efficient and cost-effective solutions in the kitchen, without sacrificing on quality.

Potato croquettes, fries, baby potatoes with marinades and pre-cooked potato products have all been widely introduced in to the offer of many Belgian potato processors and available to hospitality buyers. These products are packed with flavour and can be prepared in the oven, airfryer, microwave or deep fryer, offering chefs great quality sides with significantly reduced prep time.

CONSUMERS STILL KEEN ON SUSTAINABILITY

Sustainability is an ever-increasing influencer on purchase from both trade buyers and the end consumer. Developments have already been made within the production methods of the Belgian potato sector to tackle packaging and plastic, reduce carbon footprint and water usage to help create confidence of a sustainable product with full traceability.

A combination of efforts is allowing the market to contribute towards positive targets, such as those laid out by the European Commission including the goal to be the first climate-neutral continent by 2050.

CAMPAIGNING FOR THE INDUSTRY

This year, VLAM launched a new two-year marketing campaign to promote Belgian processed potatoes in the UK retail and foodservice sectors.

The 'Loved in Britain, Made in Europe' campaign highlights the growth of the potato category and the opportunity for retail and foodservice to build their business with a good quality and innovative frozen, chilled and fresh potato category offer.

All Belgian growers and processors are committed to working in partnership on both sides of the Channel to ensure they can meet consumer demand with quality and innovative products, with strong sustainable credentials.

To find out more, please visit *https://www.belgianpotatoproducts.com/en.* •

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Traceability Systems Stand for Authenticity and Safety

Food producers are constantly expanding their capacity to track the flow of food along the supply chain, though individual systems vary. Some traceability systems are deep, tracking food from the retailer back to the farm, while others extend back only to a key point in the production process. Some are very precise, tracking food products to the exact area of a field where they were grown, while others are less accurate.

By Tudor Vintiloiu

Traceability systems tend to be motivated by economic incentives, and not by government traceability regulations. Companies build traceability systems to improve supply-side management, to increase safety and quality control, and to market foods with certain claims - such as whether a type of food was produced without genetic engineering. The benefits associated with these objectives include lower-cost distribution systems, reduced recall expenses, and expanded sales of high-value products. In every case, the benefits of traceability translate into larger net revenues for the company.

The main purpose of produce traceability is to protect consumers' health and safety. Although potatoes have never had a large-scale recall and are a low-risk produce item as they are cooked before consumption, it is important for producers to be prepared. Although manual recall systems may work well for a company with a basic product, for a produce company that is sending potatoes from one lot to 15 customers in 27 different packages, a manual recall simply isn't fast enough. That's when software-backed systems are necessary to effectively execute a recall, especially when a company has a small timeframe to do so.

In the US, produce traceability is also required by Section 306 of the Bioterrorism Act, which states that all companies that grow, pack and ship food need to have a recall traceability program for consumer safety. PrimusGFS, the Global Food Safety Initiative (GFSI) recognized audit system RPE, and many others, also emphasize produce traceability and requires a mock recall every six months. The company is allowed to choose what item it wants to test a

recall for, whether packaging, a finished product or sprout inhibitor, as well as the severity of the mock recall. The key to produce traceability, however, is keeping good records from seed to the packaged potatoes.

BLOCKCHAIN VERIFIED SEED

The use of blockchain technology for the seed supply chain is one example where traceability will bring a real change to seed management. It provides the ability to track the purity of the seed. The unique digital identity created for every batch of seeds provides a complete history of the seed supply chain providing transparency and visibility to the buyer. Potato was designated as "Future Food" for food and nutritional security to the developing world by FAO in 2008. Potato's yield is affected by several factors, among which, seed quality is one of the most important. A recent initiative designed to bring transparency to the potato supply chain in India is Punjab Agri Export Corporation's (PAGREXCO) program that seeks to deploy blockchain technology to undertake certification and traceability of seed potato right from the nucleus to seed level (harvest). The technology will be provided by Cropin Technology Solutions – a company based in Bengaluru. By leveraging blockchain technology, the potato farmers would be able to trace the origin of the seeds they buy. Using technologies such as barcodes and QR codes, the solution will allow the farmers to cross-check whether they are buying the genuine seeds hailing from Punjab or not.

Punjab produces around 2.7m metric tons of potatoes annually and supplies around 60-70% seed potato to domestic markets. Under the project, the quality of seeds would be checked before sowing and will also be geo-tagged. The main objective of geo-tagging is to check the falsification of plantation claims. Officials said regular inspection of the field would be undertaken to keep a check on the inputs and disease.

To start with, a digitized database will be set up, which will also provide farmers with access to technical know-how on crop planning and management, inputs, credit, post-harvest management, value addition, and improved market linkages.

The centralized platform would also help in capturing all relevant information through a simple mobile application and give dashboard-based insights on the data captured thereby ensuring traceability of the entire value chain.

According to Manjit Brar, managing director at Punjab Agri Export Corporation, the seed potato traceability, and certification system will be implemented from the coming potato season. The entire process will be managed through software and certifying authority will do the due certification via the software only so that transparency is maintained.

WOOLWORTHS CASE STUDY

A multi-purpose trial to identify potato properties in Woolworths' supply chain using GS1 Global Location Numbers is underway with the support of FreshChain technology. This pilot tests enhanced traceability

functionality at an item and crate level to instantly track back to the farm origin and track forward to retail destinations using serialized and unique GS1 Digital Link QR codes.
FreshChain sensors accompany the product through the supply chain to deliver insights on key quality metrics such as temperature, light, humidity, movement and shock in real time through transit and the chain of custody ownership. Digital on-pack storytelling looks to engage customers with information on product quality, value of the content and other information such as recipes.
The trial also includes functionality, which allows for consumers to be alerted in case of an incident in real-time by scanning the QR code on pack.
The project is a collaboration between New South Wales department of primary industries (DPI), Food Agility CRC, Woolworths Group, GS1 Australia, the Mitolo Family, Cantrill Organics and FreshChain Systems.
Jessica Fearnley, the NSW DPI and overall project leader, said: "A key objective of the trial was to assess the ability to instantly identify properties in NSW through a central repository in the event of a biosecurity threat such as bushfires and deploy resources where they are needed.
We are all too aware that these threats remain and it is critical that we work toward a more centralized approach for identification, containment and support deployment."
Mel Wishart, lead for GS1 Australia, said she was keen to show how using GS1 standards in data collection and transfer can better support rapid property identification and item level product traceability in the event of a biosecurity threat or critical food incident.
"The key is using a standards-based approach so all systems in the supply chain, no matter the source language, can gather data, link the data, interpret the data and act on that information."
Woolworths' project lead, Noelene De Villiers, added that she was excited about the opportunity to work with industry to learn more about end-to-end traceability and how it can support the customer experience.
"The project participants bring together diverse capabilities, to help build a more transparent supply chain together and engage customers in a new way with on-pack digital storytelling. It is also a great opportunity to partner with our farmers and help educate customers about the provenance of the products they put in their shopping basket," said De Villiers.
Director of FreshChain Systems, Greg Calvert, welcomed the opportunity to provide the digital traceability solution and advanced quality control sensors for the project.
"We will continue to see further benefits of digital transformation and that is an exciting prospect for speed, accuracy and data access. More relevant data, linked to create valuable insights and enhanced visibility, will support all partners in the supply chain. For consumers, this is the next best thing to being on-farm." •

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APAC Potato Processing Market on the Rise

The Asia Pacific (APAC) region is one of the largest markets for processed potatoes in the world and it is also the fastest-growing region in the world.

By Ionel Vaduva

Its high-growth can be attributed to factors such as its huge population and large production quantities of potatoes in developing parts of the region like China and India. The growth of the fast-food industry is expected to further drive the market demand in the region.
Geographically, the APAC potato processing market accounted for the highest revenue share last year, and is poised to dominate the market over the period 2022-2027 owing to factors such as high fresh potato production, rapid recovery of the foodservice industry, and increasing consumer spending on ready-to-cook meals owing to COVID-19 restrictions.
In fact, according to recent Market Research data, in the next five years, the APAC potato processing market should reach USD8.94bn and is estimated to reach USD13bn by 2027. This forecast is a decrease, compared to the growth of about 11.76% per year, registered in the 2015-2019 period.
The average consumption per capita in value terms reached USD3.16 per capita (in retail prices) in 2015. In the next five years, it is set to grow at a CAGR of 6.48% yearly. In the medium term (by 2025), the indicator is forecast to slow down its growth and increase at a CAGR of 4.5% yearly.

APAC'S FROZEN POTATO MARKET

The APAC frozen potato market was valued at USD12,18bn in 2019 and is projected to reach USD16,91bn by 2027; it is expected to grow at a CAGR of 4.3% from 2020 to 2027, according to the same Market Research analysis.
In terms of volume, the region is expected to register a consumption volume of 12,596.34 KT in 2028. However, APAC is expected to grow with the fastest CAGR over the forecast period.
Demand from quick-service restaurants is likely to drive growth in this category fueled by the rise in disposable income and a clear trend towards western diets throughout the region.
The rising consumer preference for Ready-to-Eat (RTE) food products, which require less preparation and cooking time and have a longer shelf life, is also a driving factor for the market.
"In addition to this, these frozen potatoes are capable to retain all the different types of nutrients and vitamins which are naturally present with a long shelf life. Moreover, they are extremely convenient and flexible in terms of preparation and cooking time," a report by Grand View Research shows.

Asia Pacific is anticipated to be the fastest growing region with a CAGR of 3.9% from 2020 to 2027 owing to an increasing trend of RTE food among the working-class people as well as college grads of countries such as China and India.

"China, India, and Japan are the major markets, in terms of consumer spending on food. In addition, a significant rise in the demand for frozen food owing to less time for preparation and cooking is opening new avenues in the regional market for frozen food. China was the first country where the coronavirus started to spread across the globe. The country had locked down some of the severely hit provinces for more than two months. After that, many other countries have followed the trend of lockdown to maintain social distancing, the only and the most effective way to control the spread of the virus. These trends are expected to promote the scope of shelf-stable products and thus, in turn, will expand the market for frozen food over the next few years," the report shows.

Other factors propelling the growth of the Asia Pacific frozen potato market include growing urbanization, improving lifestyles of people, and increasing demand for convenience food. Moreover, the growing popularity of frozen potatoes across countries such as Japan, India, and China is also driving the regional market.

In the Asia-Pacific region, potato is grown on about 7.3 million ha, producing about 121.7 million MT of potatoes with average productivity of 16.49 MT/ha. The contribution of the Asia-Pacific region to the world area and production of potatoes is 39.3% and 37.7%, respectively.

FRESH POTATO MARKET TO GROW IN 2021-2031 PERIOD

When it comes to fresh potatoes, various industry players are increasingly focusing on establishing successful collaborations, acquisitions, and joint venture activities to enhance their respective customer bases. These players are also growing their supply capabilities to meet customer requirements on a local and global scale. This factor, paired with promising industrialization prospects in developing economies of the APAC region, such as China, India, Taiwan, Indonesia, etc., are expected to create massive business opportunities for key players over the 2021-2031 period.

According to Market Research experts, APAC is anticipated to hold a significant share of the global fresh potatoes market. The region is also expected to register the highest growth rates over the forecast period. The increasing population and growing food industry in developed and developing economies in the region are expected to increase the demand for fresh potatoes. The robust growth of food processing is also likely to provide lucrative opportunities for the development of the market.

Potato can be found in many diets today, but in the Asia-Pacific region, consumption varies significantly from country to country. In China and India, potato constitutes a kind of staple food, while in the other countries, consumption stands at much lower levels than in those two leading consuming countries. Therefore, the market for potatoes in APAC depends on mostly the population growth in China and India, as well as the increase in their incomes, which together would lead to an increase in the volume of potatoes consumed.

The economies of the key countries of the region - China and India - are projected to face steady growth, thereby continuing to be a key driver for global economic growth. The population of APAC is also predicted to grow gradually, according to the UN forecast, thereby demanding more food products and potatoes among others. That's why driven by increasing demand for potatoes in APAC, the market is expected to continue an upward consumption trend over the next seven years. •

Jonathan Thomas

Every Day A Fry-day

Despite the enduring popularity of French fries, the industry faces various challenges on the political and environmental front. Global demand for French fries and what are usually termed 'chips' in countries such as the UK, Ireland and Australia remains strong, despite the problems experienced within the foodservice industry resulting from Covid-19.

By Jonathan Thomas

Despite their similarities as menu items, some key differences exist between French fries and 'chips'. French fries are typically fried twice (rather than once, as is the case with 'chips'), while 'chips' are usually cooked at slightly lower temperatures. Furthermore, 'chips' tend to have a thicker cut than most varieties of French fries. A range of French fries exists in both foodservice and retail channels – these include shoestring (which are usually around 6mm-7mm in width), thick cut (which are typically 15mm-18mm in width) and steakhouse, which represent the thickest version available and, as their name suggests, are frequently served as an accompaniment to steak. Both French fries and 'chips' are usually eaten with a range of different sauces and accompaniments – some of the most popular include ketchup, vinegar, mayonnaise, curry sauce and a host of local specialties. Global sales of French fries and 'chips' are currently valued at

between USD15bn and USD20bn, according to Research and Markets. Annual growth is expected to average more than 6% during the period leading up to 2027, driven by the growing adoption of westernized diets in parts of the world such as Asia, Africa and the Middle East. The foodservice industry is likely to account for the bulk of consumption, given the fact that French fries remain a staple menu item for leading QSR operators such as McDonalds, Burger King, KFC and Wendy's.

MARKET & CONSUMPTION TRENDS

French fries and 'chips' remain one of the most popular side dishes in many parts of the world, especially in regions such as North America, Western Europe and Australasia. However, their appeal is also growing in less developed regions, as diets become increasingly 'westernized.' As a side dish, French fries and 'chips' are extensively used as an accompaniment to foods such as steak, burgers and coated foods (e.g. battered and breaded fish and poultry). It should also be noted that they are also suitable in most instances for consumers following vegetarian or vegan diets, although ingredients such as lard may sometimes be used in the cooking process.

In Europe, consumption of French fries is heavily skewed towards the more northerly countries such as the UK, Germany and the Benelux nations – it is estimated, for example, that per capita consumption in Belgium amounts to 75 kg, the highest in the world. This compares with around 14 kg in the US, which has the world's largest market in consumption terms and is valued at around USD4bn per annum.

Around one quarter of all potatoes produced in the US are consumed as French fries. The US ranks as one of the world's leading producers of French fries, with considerable quantities exported – major overseas markets include Canada, Mexico, Japan and South Korea. Elsewhere, China continues to strengthen its position as a producer and exporter of French fries. Output for 2021/2022 was worth an estimated 420,000 tonnes, up by 20% from the previous year. During the same period, exports fell by 10% to 40,000 tonnes, mostly due to the disruptions to global trade caused by the pandemic. One of China's main export markets for frozen French fries is the Philippines, where demand has grown strongly in recent years.

The popularity of 'chips' within the UK diet shows little sign of receding, despite the numerous problems suffered by the country's foodservice industry during the pandemic. In 2021, visits to the UK's 'fish and chip' shops recovered faster than any other foodservice channel, with visits reaching 65% of pre-pandemic levels. Expenditure at fish and chip shops amounted to 86% of pre-pandemic levels during this time, although it should be noted that many outlets are now suffering from the soaring costs of key ingredients such as sunflower oil caused by the Russian invasion of Ukraine.

'Chips' and French fries are widely sold throughout the UK foodservice industry. According to data from Lumina Intelligence, over half (51%) of all eating occasions in the UK's pubs between November 2020 and January 2022 included 'chips', either as a main course or side dish.

Separate data from Lamb Weston in 2021 found that 40% of UK consumers routinely opt for 'chips' as a side dish. When consumed within a pub, 60% liked the skin-on variety, whereas 35% were positively inclined towards plain 'chips'. Meanwhile, 'chips' also appear to be benefiting from the consumer desire for comfort foods in these troubling economic times. A 2021 survey from pub and restaurant chain Hungry Horse found that 'chips' were the favorite food to make people happier, ahead of foods such as pizza and fish fingers/battered fish. 'Chips' were voted for by 30% of women and 21% of men.

In recent years, foodservice operators have begun to experiment with new and more exciting ways to serve 'chips' and French fries, to cater towards more adventurous consumer tastes. One notable example is so-called 'loaded fries', which now feature on a multitude of menus, either as side dishes or standalone meals/snacks. Much of the growth in demand for loaded fries in recent years has come from the rising popularity of street foods in parts of the western world, which can be eaten during a range of informal dining occasions out of the home. According to data from McCain, loaded fries can be up to 60% more profitable for foodservice operators compared with regular servings.

Loaded fries are becoming more widespread throughout much of the world – in the US, for example, research from Datassential found

CHIPS VS. FRIES VS. CRISPS

In **Great Britain** and **Ireland**, the potato product definitions differ very much from the rest of the world. Potato chips are referred to as "crisps" and French fries are referred to as "chips". In some places, speakers of British English may also refer to potato wedges as "chips" and potato strips as "fries". In **Australia**, **New Zealand,** and **South Africa**, the words "crisps" and "chips" have even more different meanings. People use the term "crisps" as a blanket term for all fried potato products, both hot and cold. The term "packet crisps" specifically refers to slices of potatoes that are fried and served cold. Finally, the term "chips" refers to corn chips or tortilla chips, which are made from ingredients other than potatoes.

that 88% of the population had heard of loaded fries and 70% had tried them at least once. According to the aforementioned Lamb Weston research, over a quarter (26%) of UK consumers liked eating loaded fries when dining in a pub. Some of the most popular toppings for loaded fries are based around cheese and/or meat, with pulled pork and beef or vegetarian chilli being two notable favorites. There have even been instances of French fries being topped with melted chocolate in countries such as Mexico, thereby offering a whole new and different taste experience. Aside from loaded versions, the popularity of skin-on fries shows no sign of receding. Many foodservice operators, as well as manufacturers and retailers, now include skin-on fries within their respective portfolios. Not only do these present a more rustic and authentic appearance, but they also boast an impressive texture, with many varieties marketed as being especially crispy. Consumers have also demonstrated a growing interest in French fries and 'chips' made from sweet potatoes, the appeal of which continues to increase.

Packaging also represents a significant consideration when supplying 'chips' or French fries. This has become especially important given the growth of the food delivery industry, which has seen more portions of French fries and 'chips' transported from foodservice outlets to people's homes. One of the most popular packaging formats for French fries has traditionally been paper-based containers featuring a layer of polyethylene, to prevent the leakage of grease. The packaging also needs to incorporate some form of ventilation to allow steam to escape and therefore prevent the food from becoming soggy, while at the same time ensuring heat is retained. In the past, the use of plastic containers for French fries and 'chips' was widespread, but these continue to lose share to paper/board formats, largely for environmental reasons.

One company which has been experimenting in this sector is the Dutch-based firm Paardekooper. Early in 2022, it launched its new Depa French fries box, which is targeted at food delivery applications. It is manufactured using three-layer corrugated paper, which carries accreditation from the Forest Stewardship Council (FSC) to ensure sustainability concerns are met. This also provides good insulation, while the incorporation of a separate absorption pad and special ventilation features help to reduce moisture levels within the packaging. As such, the fries will stay warm and crispy for longer periods.

On a related note, it is also worth noting that leading foodservice operators such as McDonalds and Burger King are facing prospective lawsuits in the US due to their continued use of PFAS chemicals in packaging for foods such as French fries. These chemicals, which provide greaseproof properties, have been linked with infertility, deficiencies with the immune system and increased risk of some cancers, for which reason the Environmental Protection Agency (EPA) announced a three-year initiative to regulate and restrict their use in the autumn of 2021. Both McDonalds and Burger King have committed to removing PFAS chemicals from their packaging by 2025.

Looking ahead, both foodservice operators and manufacturers of 'chips' and French fries could potentially face problems caused by the expected increase in the cost of potatoes resulting from the heatwaves experienced in Europe during the summer of 2022. In countries such as the UK, the extreme temperatures recorded during July and August are believed to have compromised the yield and quality of many potato

crops, raising the prospects of supply shortages by the autumn. It has been speculated that the price of potatoes could increase by up to 20% during the autumn of 2022, which equates to a rise of 60% compared with 12 months earlier.

CORPORATE & NPD ACTIVITY

The Canadian multinational McCain represents the leader of the global market for frozen 'chips' and French fries. Many of its products are available in premium formats, examples of which include extra crispy and seasoned, while its Home Fries is one of the world's most popular brands. A recent addition to its US range was Quick Cook French Fries – as their name suggests, their main benefit is the fact that they can be prepared speedily, in around half the time needed for conventional French fries. Made with 100% real potatoes and no artificial flavors, the new products were launched in Straight Cut, Crinkle Cut and Waffle Cut varieties.

McCain's UK operation has recently addressed the growing popularity of loaded fries with the launch of Street Fries. These are available in varieties such as Cheese & Bacon, BBQ Beef and Pulled Pork. The company has also made attempts to tap into the growth in demand for products comparable to foodservice sector offerings, a trend which gathered pace during the pandemic. Its UK range now includes Flavor Maker French Fries, which are positioned as delivering restaurant flavors for consumption in the home – these are available in Smoky BBQ and Garlic & Herb Chimichurri flavors. In markets such as the UK, McCain also supplies French fries featuring a crispy beer-inspired coating.

One of McCain's leading competitors in the UK market is Nomad Foods, which has owned the Aunt Bessie's brand of frozen French fries since 2018. The Aunt Bessie's range includes Homestyle 'chips', French Fries and Crinkle Cut 'chips'. Also present in the market is Aviko, which ranks as the world's fourth largest supplier of value-added potato products and operates manufacturing facilities in the Netherlands, Belgium, Germany, Poland, Sweden and China. In the middle of 2021, it extended its Crunchy Shapes range with new Grip 'n' Dip, which was targeted at applications within the foodservice industry. These are described as special U-shaped French fries with an extra crispy coating, which makes them especially suitable for eating with dipping sauces.

Lamb Weston is another leading supplier in the UK and further afield, for whom innovation remains important. The company's foodservice range includes varieties such as Hot2Home (which stay hot and crispy for up to 20 minutes), Stealth Fries (which are coated for an extra crispy bite) and rustic fries, which boast a homemade look and feel. Also part of the Lamb Weston range is The Dukes of Chippingdom, which are marketed as traditional British 'chips' within the UK market. Available in skin-on and skin-off varieties, these are positioned at the premium end of the market due to their handcut appearance. •

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Cold Storage Solutions Fend Off Crop Quality Issues

Refrigeration is an important asset that allows growers and agricultural companies to keep potato crops from spoiling during storage. At the same time, ensuring a storage facility runs efficiently is a critical part of managing a successful potato production system, as disease-free, firm potatoes, have a much greater value on the market.

By Tudor Vintiloiu

The need for application-specific refrigeration technology has grown in the potato market. According to specialists, the two critical environmental factors involved in properly storing potatoes are temperature and humidity and modern refrigeration solutions are successfully tackling these specific problems.

Tolsma-Grisnich has developed various refrigeration systems to create ideal conditions for the potatoes in storage, realizing the optimal storage efficiency is the main objective of the refrigeration systems.

The GCU (Green Cool Unit) is one of the Tolsma's own innovations. Achieving optimal storage efficiency was the goal in developing this direct cooling system, so minimal drying-in and energy saving are crucial. The application of advanced compressor technology in combination with an intelligent control system (developed in-house) has made it possible to achieve the highest possible efficiency for the total storage system. The GCU is available with a variety of cooling capacities ranging from 20 to 185 kW. Various other options geared to the special requirements of the product include electronic defrosting of expansion valves. The GCU can be supplied in a weather-proof casing or built into an engine room or container.

The GCU-I (Green Cool Unit-Indirect) is an indirect cooling system that Tolsma has also developed. The GCU-I (chiller) was developed using the same criteria as those applied to the GCU units. This version is ideally suited to the storage of several types of product in different storage climates. The GCU-I provides the feature to cool separate cells at different temperature levels. The minimal temperature difference across the evaporator means that the storage efficiency of this cooling system is optimal, and the quantity of synthetic refrigerant required is minimal, so that less (statutory) maintenance is required. The GCU-I is available from 20 to 200 kW.

CONTROL AND MAINTENANCE

The cooling installation is controlled by the Vision Control climate computer. This intelligent and user-friendly system ensures the optimal functioning and efficiency of the cooling installation. Special requirements as regards management, control, maintenance and supervision apply by law to cooling installations. It is crucial that the installation is checked and (if necessary) serviced annually. Yearly monitoring includes, amongst other things, extensive checking for any leakage of refrigerant. In addition, the specialist maintenance team from Tolsma will check the compressor, condenser, air cooler (evaporator) etc.

THE VISION CONTROL SYSTEM

The Vision Control is an intelligent storage computer that controls temperature and relative humidity as well as CO_2 level by regulating fans, hatches, heaters and refrigeration devices. This results in minimal storage losses as well as optimal energy saving. The screen of the Vision Control shows a diagrammatic view of the storage and of the refrigeration. The status of the product and the installation are clearly shown. Furthermore, the Vision Control gives the uses automated tips for the optimal settings of the climate computer. Moreover, the Vision Control energy management module (15-inch model) is an energy efficient tool. By setting the maximum allowed energy consumption and setting the system priorities, the storage and other energy consuming facilities are automatically switched on or off. This results in the least storage losses and highest energy savings.

WEATHER IN CONTROL

Weather in Control is an optimization module from Tolsma which, based on a 10-day weather forecast, takes intelligent decisions regarding the ventilation and refrigeration strategy. The module's advantage is maintaining a more precise desired storage temperature of the product with lower weight loss and reduced energy costs. The profit of the system is being made by making efficient use of the available moments when cold outside air is available. Weather in Control will adjust the climate computer's settings so that, depending on the situation (periods with either predicted lower or higher temperatures), start sooner or later with external ventilation or mechanical refrigeration. The decisions are made based on: expected outside temperatures, the set target temperature, energy rate structure, possible present mechanical refrigeration. Last but not least, the climate computer can be controlled via internet connection (PC, tablet, smartphone). This gives the user continuous insight in the storage facility and the possibility to adjust the settings.

ENERGY EFFICIENCY

According to specialists, the ideal potato storage should have a proper cold supply and return airflow pattern, uniform temperatures, and constant relative humidity levels across the entire surface. A correctly designed control system can effectively monitor all the desired levels along with the Parts Per Million (PPM) levels of oxygen and CO_2 in the potato storage.

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"We have a line dedicated to Potato Storage Refrigeration Systems. Kooljet systems are offered with microprocessor controls complete with Color Touch Screen, Bacnet & Modbus options. Programmable Logic Controllers (PLCs) are highly accurate for precise temperature controls. Our systems are designed with the most advanced technology presently available. Energy efficient Electronically Commuted (EC) Fans and electronic expansion valves are used to get systems to operate at maximum efficiency," JD Wasir, Kooljet Sr. vice-president mentioned.
He added that Kooljet packaged systems, designed with automated control systems, would provide maximum efficiency and significantly reduce unit maintenance costs. System controls are constantly monitoring the operation, and in case of alarm conditions, the alert notification is sent to the operator. On-time abnormal system notifications could avoid unit failure and save substantial capital. The operator could even remotely monitor the system from his smartphone.

THE CHALLENGES OF POTATO STORAGE AND THE NECESSARY EQUIPMENT TO OVERCOME THEM

Usually, potatoes stored at temperatures above 4.4 degrees Celsius for more than a few months will require a sprout inhibitor. Some of the sprout inhibitors contain chlorine fumes. Chlorine vigorously reacts and corrodes the aluminum fins of the evaporator coil, reducing the coil life.
As a solution, Wasir pointed out that Kooljet packaged refrigeration systems are equipped with optimal-designed evaporator coils complete with corrosion-proof coating on the aluminum fins and copper piping.
"The coated evaporator coils protect the aluminum fins and copper piping from chlorine gas fumes present in the potato storages. The coated evaporator coils prolong the evaporator coil life compared to the conventional bare fin aluminum coils. Our water-based coating has the maximum salt spray hours in the industry," Kooljet Sr. vice-president explained.
He also said that maintaining desired pile temperature is important but equally important is maintaining the optimum humidity (RH). RH plays a vital role, as it affects the rate at which produce transpires. For best potato storage conditions, high humidity levels must be maintained.
"The minimal evaporator coil temperature differential avoids air to cool below its Dew Point temperature. Kooljet Systems helps to maintain the high RH levels in the storage and minimizes the water loss from produce, maximizing product quality and value," Wasir declared.

THE SUCCESSFUL OPERATION OF THE CONTROL SYSTEMS

As earlier mentioned, the pile temperature plays an important role in keeping the stored potatoes' quality. Respiration, sprouting, water loss, relative humidity,

chemical composition, and other storage diseases are greatly influenced by temperature fluctuations. The rate of respiration changes with temperature variation in potato storage. Maintaining uniform storage temperature is critical, as fluctuations shorten potatoes' life expectancy, the expert declared.

"Some varieties of potatoes are required to be cooled gradually at the rate of minus 5/9 degrees Celsius every 1-2 days to the desired holding temperature. Cooling too rapidly will shock the tubers causing an excess buildup of sugars, which can affect cooking and eating quality. Uneven temperature can also affect potato sugar levels. Accumulation of sugars from starch influences the processing of potatoes, leading to dark chips and French fries when the potatoes are processed," JD Wasir clarified.

Refrigeration systems designed with a microprocessor-based, accurately designed control system can avoid all the above issues in potato storage, increasing the shelf life of the produce.

Potato storage located in the colder climate region must fully utilize the cold ambient air to cool and maintain potatoes. The control unit must make use of the "Free Cooling" provided by Mother Nature. Kooljet offers packaged units equipped with the Free Cooling option, which is extremely beneficial in colder climate regions.

During free cooling mode, once the ambient temperature is lower than the room set point, the controller shuts the compressors off and opens the built-in modulating economizer to bring the cold outside air into the room. The option not only saves energy in the wintertime but also extends the life span of the unit due to less wear and tear. This option can also be used for warmer climate regions, with the unit economizer used to introduce fresh air in the cold room. The amount of oxygen and CO_2 levels in the room determines the intake of fresh air. Plenty of fresh air can delay or even prevent the senescent sweetening of potatoes. A heating element may be installed in the fresh air supply duct to warm up the incoming air, if necessary.

"Kooljet systems can be Micro-processor controlled, complete with electronic sensors for monitoring the CO_2 levels in PPM, relative humidity in %, and the temperature in Fahrenheit degrees or Celsius degrees. Kooljet has a global footprint and has been assisting farmers since 2001. Kooljet systems are used by many potato operations in Canada and elsewhere – including McCain Foods, Canada-China, and Calbee Potato in Japan," Wasir concluded. •

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Managing Disease and Loss of Quality in Storage

A common misconception regarding potatoes is that they are something inert once they are in storage. But potatoes are alive and their physiology continues to change in storage. As they age, starches break down into sugars, which can lead to issues that reduce the value of the product. Improper conditions lead to the development of diseases, and while tubers remain dormant initially, they will eventually break from this dormancy period, leading to sprouting if left untreated.

by Tudor Vintiloiu

To maintain potato quality during storage, the storage environment must be adjusted to minimize tuber deterioration. Temperature, humidity and air movement can always affect the keeping quality of stored potatoes, and they should always be kept in complete darkness to prevent greening. When potatoes are not properly stored, tuber losses due to fungal and bacterial infections can be devastating. According to the Canadian Horticultural Council, the majority of storage diseases are partially or completely inhibited by storage temperatures below 7.2°C (depending on the variety). At temperatures above 10.0°C the growth and development of disease organisms increases dramatically augmenting the risk of total breakdown. Risk of breakdown is greatest just after the storage has been filled, especially during hot weather. Temperatures above 10.0°C should be avoided during long-term storage. The hatching of flies is also inhibited below 10.0°C, thus the presence of flies indicates that the temperature is too high somewhere in the storage and breakdown may become a problem.

QUALITY CRITERIA

Dr. Laura Bouvet, crop scientist and cereal pathologist has worked with Agri-TechE and AHDB since 2018 and says there are three main diseases and physiological issues which potato store owners and processors should be wary of:

- Rots and blemish diseases
- Sugar buildup
- Sprouting.

"The impact of these issues further down the distribution chain depends largely on whether the potatoes are destined for fresh pack sale, processing or for animal feed. The fresh-pack sector demands low levels of blemish diseases – these diseases cause visual abnormalities, which reduce the value of the potato to consumers. An example is black dot – which shows up as light to dark brown patches with black dots on the skin surface, detrimental

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from a visual perspective.
For processors, those sugar levels are important. High sugar levels can lead to unacceptable fry color, affecting quality further down the supply chain in a number of ways. Dark crisps or chips can indicate the presence of unacceptable levels acrylamide, a known probable carcinogen. There are commercial standards from a food safety perspective to keep acrylamide levels as low as possible, and that means keeping an eye on their fry color in storage with fry color tests.
Sprouting in storage is one of the main concerns for store managers, particularly now that chlorpropham (CIPC) has been withdrawn and available alternatives aren't like-for-like replacements. It affects the downstream value of the potato – whether that's in processing where sprouts need to be removed prior to processing, or the fresh pack sector – because visually they affect consumer demand. Left untreated, sprout growth will cause water and weight loss as the potato respires and grows, reducing weight-at-sale by 2-3%, so it's important to keep sprout growth under control during storage."

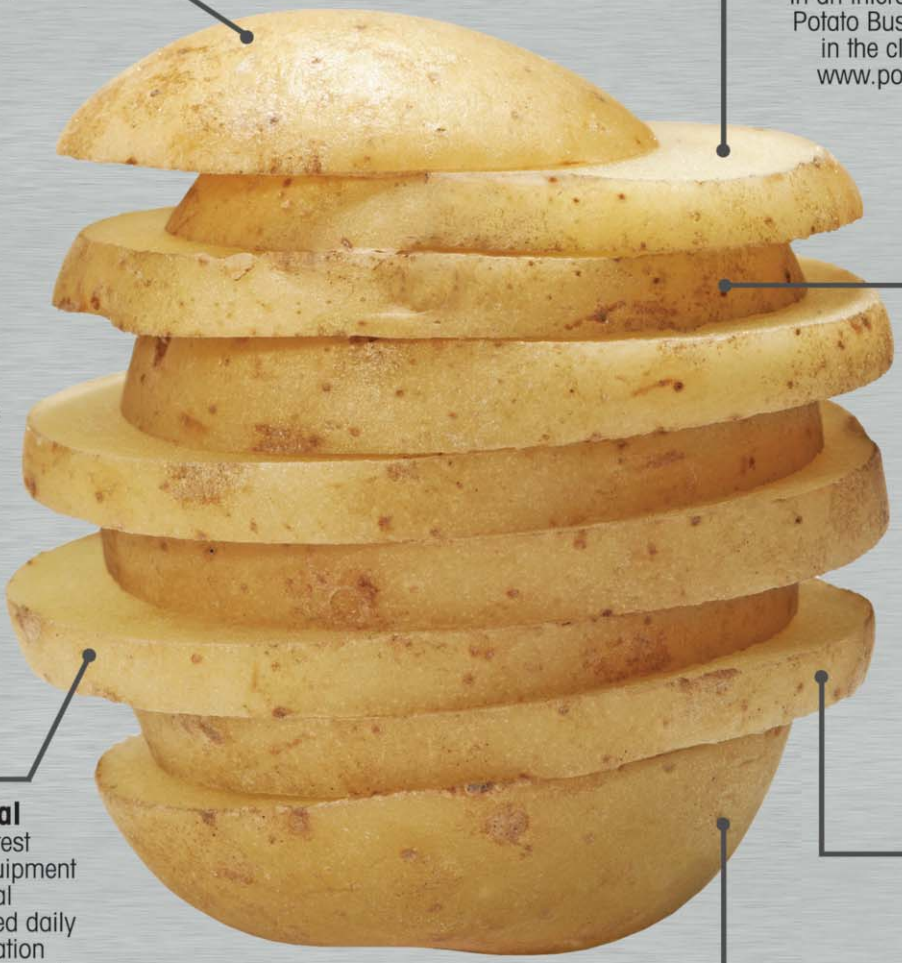
EARLY PROBLEM DETECTION

An early defect detection research collaboration between B-Hive – an R&D company, focused on solving real industry challenges in the fresh produce industry and the University of West England, funded by the UK government's Knowledge Transfer Partnership – is working on non-destructive methods to monitor the gaseous emissions of potatoes in store for early detection of internal defects.
"We're investigating whether technologies will have the sensitivity to identify specific defects in potatoes, but currently we are working on the ability to detect the presence of any defect within a region of the store. Informing the store manager of a problem in an area of the store would allow the manager to react, either by managing the store environment or by prioritizing moving the crop earlier. These actions are all part of the sort of Integrated Store Management approach that advisers are recommending now that fewer chemical treatments are available for in-store management. The ultimate aim of the project would be to be able to detect specific defects but even if we're able to identify general changes and indicators of defects and/or diseases that would still provide a huge advantage to store managers," said Alison Wright, R&D Project Manager, B-Hive.

CONTINUOUS MONITORING

A good storage management program should include daily checks of the storage. Store owners should make sure that the ventilation controls and dampers are functioning correctly especially during very cold weather when the danger of ice buildup is greatest. Temperature should be constantly monitored both of the air and of the tubers at several locations in the storage. A thermometer or temperature probe located 50-100 cm below the top surface of the pile will give an indication of the highest temperature in the storage. Relative humidity can be checked at the same time with a humidity gauge or psychrometer. The Canadian Horticultural Council recommendations encourage managers to be alert for the signs of soft rot development - a pungent smell, depressions in the pile, water in the ventilation ducts and hot spots in the pile. Early detection of soft rot is now possible with the use of infra-red thermometers. These devices, which look like radar guns, can be used to measure temperatures at the top of the pile. Areas of potential breakdown will show up as "hot spots", often as much as three weeks before other symptoms are noticeable. Records of all storage conditions should be kept daily so that if problems arise there is some way of determining the cause.
In the case of processing crops other factors should also be strictly monitored, such as the accumulation of sugars if the CO2 level in the storage is too high. Current recommendations call for CO2 levels to be below 2500 PPM (0.25%) for most French fry varieties, and even lower (1500-2000 PPM) for chipping potatoes and certain French fry varieties. Growers are advised to include CO2 measurement as part of their daily storage checks, or to purchase a CO2 sensor for their control panel to maintain desired CO2 levels. If the storage is equipped with heaters, they can be turned on to help bring in extra fresh air by venting the storage. •

It's all about POTATO



POTATO PROCESSING INTERNATIONAL

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 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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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.

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