POTATO PROCESSING
INTERNATIONAL

Supporting the potato industry worldwide

Issue 6 • Volume 29 • 2021

Snacks
Where Now for Spuds?

Process
How to Save Valuable Resources in Potato Processing

Interview
Cristophe Vermeulen, Belgapom's CEO

Showtime
INTERPOM Exhibitor Highlights

PB

visit **potatobusiness.com** incorporating our digital magazine

POTATOBUSINESS

#digitalmedia

#news
www.potatobusiness.com

#exclusive content
Potato Business Digital

#insights
Dossier

#industry updates
Newsletter

#customization
e-Blasts

Contents

Almost Business as Usual

Tudor Vintiloiu - Editor in chief
email: tudor.vintiloiu@trade.media, Skype: tudor.vintiloiu

The 20th edition of INTERPOM, the trade fair for the entire potato chain, was finally held a year later on 28, 29 and 30 November 2021 in Kortrijk Xpo. The circumstances were unusual, to say the least, because of the stricter health and safety measures imposed by the government right in the final phase of the set-up of INTERPOM. But the trade fairs were still subject to the trade protocol, which allowed INTERPOM to go ahead in accordance with the guidelines set by the government: compulsory wearing of face masks, STC checks and ventilated halls. The potato community was relieved to be able to meet in a safe environment in order to be able to focus on the past season, which has been quite exceptional, as well as on the issues related to climate change and potato storage, but above all on the preparation for the 2022-2023 season. In short, almost business as usual, because despite the virus, the world keeps turning and potatoes must therefore be grown, processed and marketed. During the three days of the event, I have met with many key players of the potato industry and they were all excited to re-connect and eager to resume their projects and investments which had been put on hold due to the continued disruption of the pandemic waves.

In short, almost business as usual, because despite the virus, the world keeps turning and potatoes must therefore be grown, processed and marketed.

You can read some of their comments and impressions in the special section of this issue called 'Exhibitor Highlights', where we asked a few company representatives to share their view on the current state of the industry, to comment on their product novelties and R&D efforts, and to offer us a glimpse into their medium-/long-term business strategies. Another key takeaway from Interpom is the quick interview granted to us by Cristophe Vermeulen, Begapom's CEO, whose mandate will see him establishing communication within the sector and keeping the discussion going on key topics between farmers and processors. His optimistic approach will most likely not only help keep the industry going in the right direction, but also to navigate whatever hurdles may arise, into a 'business as usual' scenario that everyone looks forward to. ●

Tudor Vintiloiu (editor in chief)
email: tudor.vintiloiu@trade.media
Tel: +40 721 277 042
Skype: tudor.vintiloiu

Ionel Vaduva (on-line editor)
email: ionel.vaduva@trade.media
Tel: +40 21 315 9031
Skype: ionel.vaduva

Cristina Nae (advertising sales director)
email: cristina.nae@cmgromania.ro
Tel: +32 499 731 114/+40 725 409 997

Marian Cilibeanu (production manager)
email: production@trade.media

Simona Dumitrescu (circulation manager)
simona.dumitrescu@trade.media

Raluca Canescu (publisher)
raluca.canescu@trade.media
Tel: +40 21 315 90 31
Skype: raluca.canescu

Nicoleta Marasescu (managing director)
nicoleta.marasescu@trade.media
Tel: +40 723 452 329
Skype: nicoleta.marasescu

Contributing writers
Jonathan Thomas, Cedric Porter, Nora Olsen, Mintel Group LTD, Euromonitor International, Future Market Insights, AHDB, Persistence Market Research

(IT Support)
email: admin@trade.media

Editorial office:
Trade Media Solutions SRL,
G-ral David Praporgescu Street, no.1, District 2, Bucharest, 020965, Romania
Tel: +40 21 315 9031
www.mediatrade.ro

Printed by: Sothis
ISSN: 0968-7661

facebook
Like our page and join our online community: www.facebook.com/**Potatobusiness**

twitter
Follow us on Twitter: http://twitter.com/**potatobusiness**
We will update regularly on our activities, upcoming features and show attendance.

LinkedIn
Join our group on LinkedIn search for: **PPI News**

Trade Media SOLUTIONS

Annual subscription:
1 year €120 and 2 years €210
Subscribe online: www.potatobusiness.com/subscribe
Email: subs@mediatrade.ro
or Telephone: +40 21 315 90 31.
Visit our website: **www.potatobusiness.com**



French Fry & Potato Co-product Solutions **designed for your business**

- Potato Handling & Storage
- Preparation & Electroporation
- Batter Coating
- Frying & Oil Management
- Energy Saving
- Pollution Control
- Seasoning & Conveying








Across industries and applications, we design specialised solutions.

Bringing together leading brands in processing and packaging equipment for the French fry and potato product industries. Our solutions set the standard for yield, efficiency, and safety while producing the highest quality straight cut, crinkle cut, wedges, curly fries, hash browns and potato gems. Whatever your product needs, we can meet it with precision and passion.

HEAT AND CONTROL | FastBack | SPRAY DYNAMICS | MASTERMATIC

info@heatandcontrol.com | heatandcontrol.com

EUR66m Investment in Solanic Potato Protein Capacity

Most of the EUR66m Royal Avebe's investment in its innovation and sustainability program will be linked to the Solanic potato protein capacity. This expansion of the Dutch cooperative of starch potato growers, whose tubers are processed into high-quality food ingredients, will result in a substantial increase in the production output volumes, starting this potato harvest season 2021. Preparations for further growth are already in place to keep up with the expected growing market demand.

"A growing number of consumers are looking for plant-based alternatives without compromising on texture and taste. Since 2007, already ahead of the plant-based protein transition, we have been successfully supporting this consumer demand with our highly functional Solanic potato protein isolates," Bart Pennings, Director of Business Development at Royal Avebe, said.

Global Partnership for Kiremko and Insort

Kiremko and Insort GmbH have entered a long-term global strategic partnership, in which Insort will provide sorting and sensor expertise and equipment based on Chemical Imaging Technology CIT, both years ahead of the current standards in classifying food, which delivers the most reliable and precise product and processing data, according to a company press release.

With its potato processing and machine-building knowledge, Kiremko will develop advanced process controls, utilizing inline data provided by Insort. The combined expertise will improve automation and control of the potato process in real-time, to optimize process quality and efficiency.

"We are very happy to announce the partnership between Insort and Kiremko. Going forward, our customers will experience all the advantages of the combination of Insort and Kiremko technology and will see how our ideas about data collection will be very beneficial for the efficiency of their potato processing line," Andy Gowing, director of Kiremko, mentioned.

Tasteful Selections Acquires RPE and Becomes Tasteful Partners

The new Tasteful Partners entity, which emerged after Tasteful Selections took over RPE, is a wholly-owned CSS Farms subsidiary. Tasteful Selections was incorporated in 2009 by multi-generational potato farmers who recognized an opportunity to expand the potato category to meet the busy consumer's preference for simpler, convenient meals. Planting and harvesting more than 300 days a year, Tasteful Selections owns the entire planting, growing, harvesting, and packaging process and today is the brand leader of the baby potato category. The Tasteful Selections-RPE partnership has been in place since Tasteful Selections began growing and packing potatoes in 2010.

"The creation of Tasteful Partners consolidates RPE expertise, proprietary data, category insight, intellectual property, and sales strategy assets with Tasteful Selections planting, growing, harvesting and packing processes," according to a press release published by Blue Book Services.

LW's Sales Go Up but Earnings Plummet in Latest Fiscal Report

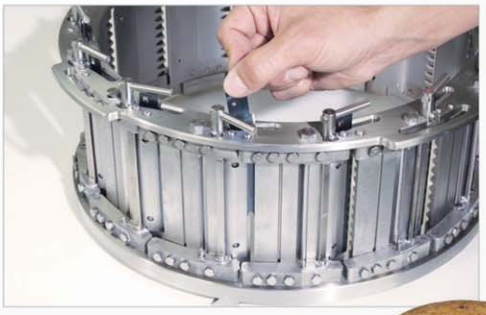
During the 2022 US fiscal year (starting on October 1, 2021, and ending on September 30, 2022), Lamb Weston Holdings, Inc. gross profit margins will probably remain below pre-pandemic levels, according to the latest statement of Tom Werner, President, and CEO of LW. Based on his current statement, the LW reports on the fiscal year first quarter 2022 results (FY 2022), and updates on the FY 2022 outlook, only the net sales show an increase of 13% to USD984m. The rest (income from operations, net income, diluted EPS, and adjusted EBITDA) shows two-digits margin declines to remain below pre-pandemic levels through FY 2022.

"Our first-quarter sales results reflect the ongoing broad recovery within the frozen potato category, with overall demand in North America near pre-pandemic levels, and our shipments improving in each of our core restaurant and foodservice sales channels," said Tom Werner, President, and CEO of LW. "However, the impact of extreme summer heat that negatively affected potato crops in the Pacific Northwest, combined with industry-wide operational challenges, including highly inflationary input and transportation costs, labor availability, and upstream and downstream supply chain disruptions, will result in higher costs as the year progresses, and significantly pressure our earnings."

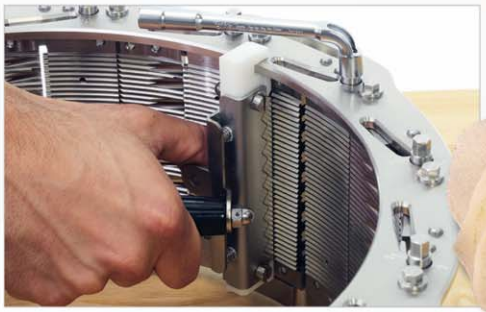
Adaptive Slicing Technology

Successful processors rely on Urschel to deliver profitable cutting solutions to adapt to changing production goals.

Meet the MicroAdjustable® SL-14 Slicing Head. The lightweight head (35 lb - 16 kg) offers 14 cutting stations, versus the standard 8, for precision slices at amplified capacities. Urschel durability and dependability are built into every head that Urschel manufactures. Expedient knife changeovers provide swift substitution of heads.



View videos and learn more at www.urschel.com.



URSCHEL®

Set-up a free test-cut of your product:

info@urschel.com

www.urschel.com

THE GLOBAL LEADER IN FOOD CUTTING TECHNOLOGY®

NORTH AMERICA | EUROPE | SOUTH AMERICA | ASIA | AUSTRALIA | AFRICA

#1 Best Selling provider of industrial cutting machinery throughout the world.

The Global Potato Chips Market Reached USD32.2bn Last Year

In 2020, the global potato chips market size reached a total of USD32.2bn, with the industry likely to grow with a compound annual growth rate (CAGR) of 3.92% from 2020-2028, to achieve USD43.8bn by 2028, according to a report by ResearchAndMarkets.

The "Potato Chips Market Global Forecast 2021-2028, Industry Trends, Share, Insight, Growth, Impact of COVID-19, Opportunity Company Analysis" whose abstract was recently published shows that in 2019, the outbreak of COVID-19 had a significant impact on Global Potato Chips Market. "One of the biggest reasons for the decline in the market amidst COVID-19 is the empty grocery shelves shown due to supply chain hurdles. Moreover, despite the disturbances in the supply chain of potatoes, the extorted lockdown beyond the world and widespread work from home scenario actively supported the at-home food consumption and extension in snack stocks, which, in turn, augmented the demand for potato chips in 2020. Hence, the COVID-19 pandemic resulted in the generation of opportunities for numerous private players to arise in the markets to purvey the inflated demand for potato chips," the analysts mentioned.

French Fry Supply Chain Resilient to Climate Change

Scientists at the University of Florida developed an innovative modeling approach to the assessment of climate adaptation and mitigation opportunities in fruit and vegetable supply chains and found out in this respect that French fries, as well as pasta sauce, are surprisingly resilient to climate change.

The innovative methodology includes climate, crop, economic, and life cycle assessment (LCA) models, applied to US potato and tomato supply chains. The crop modeling shows that planting strategies can be used to avoid higher temperatures. Land and water footprints will decline over time due to higher yield, and greenhouse gas emissions can be mitigated by waste reduction and process modification.

"[…] Employing such methods will be essential as food systems are forced to adapt and transform to become carbon neutral due to the imperatives of climate change," the authors said.

New Rosenqvists Belt French Fry Drying System

The new belt drying system from Rosenqvists Food Technologies is ready to heat with hot water-driven coils, dealing with both drying – the largest cost factor in the French fry processing line, and also providing a sustainable ecosystem.

"With the heat recovery system utilizing the vapors from your frying system, you can harvest up to 85% of the energy from the fryers to run the drying system and other systems in your production," according to a recent company press release. Having in mind both hygiene and energy efficiency, the Rosenqvists engineers developed a new belt drying system with a modular system, offering maximum flexibility and control. "We can offer width up to four meters wide belts. Each module is controlled individually allowing you to control drying recipes completely. All heating coils – using water or steam – are located outside the product zone and are easily accessible for maintenance. The belt dryer is offered with a fully integrated CIP system. With the latest design changes for improved hygiene, we feel confident cleaning is made easier and we have greatly reduced the risk of any bacterial growth," the company's representatives also mentioned.

Massaferro Potato Benchmarking Business Bought by Arterris

The giant Arterris, based in Castelnaudary, Aude department, France, recently acquired Massaferro, a benchmarking business for potatoes from Provence, based in the plain of La Crau, the French Var department. The acquisition of Massaferro is a great transaction for the Arterris cooperative, according to Actu.fr. The potato benchmarking business, which has 60 employees, produces, but also conditions, 35,000 tons of potatoes per year, from around a hundred small-scale farmers.

The benchmarking business has been able to diversify with organic, residue-free, national, and European research projects, to support French producers. On the other hand, the agricultural cooperative Arterris has a turnover of close to EUR1bn, with 2,200 employees and 25,000 member farmers. This operation will aim to facilitate Arterris farmer members to start potato production, with Massaferro by their side, who has a large commercial network.

Kiremko
Food Processing Equipment

IDAHOSTEEL REYCO

Are you up for a reduction in your:

fair future KIREMKO

- Cleaning time
- Oil consumption
- Power usage
- Total cost of ownership

Head to kiremko.com

kiremko.com +31 348 47 94 00 | idahosteel.com +1 208 522 12 75

State of the Art Potato Storage Facility in Ukraine

With a total of over 6,000 square meters, an implementation period of 10 months, and more than EUR3,7m in investments, The Continental Farmers Group's potato storage facility construction in the village of Chukva (Sambir District, Lviv Oblast) has been completed. The potato storage facility can store 16,000 tons of harvested potatoes at any given time and is one of the largest spud storage facilities in Ukraine. It has been constructed above ground and it is split into six chambers, each one having the capacity to store 2,650 tons of potatoes. Potatoes are stored in bulk and may be stored at the facility for up to 10 months without any loss in quality.

"Continental is one of the leading potato producers in Ukraine and we consider this field of operations as one of our strategic priorities. Each year, we grow potatoes on a land area of two thousand hectares and we also are improving the technologies and expanding our production facilities all the time. After putting the new facility in the village of Chukva into operation, our Company may store one-time over 100 thousand tons of potatoes and supply them to our buyers during virtually the entire year, ensuring consistently high quality of the potato," Georg von Nolcken, Continental Farmers Group CEO, commented.

Potato Chips and Snacks Business Purchased by Grupo Apex

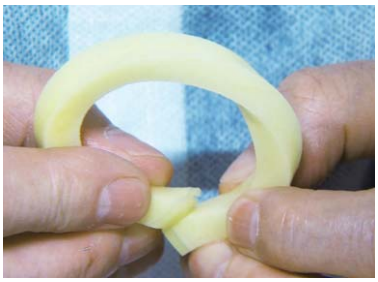
Grupo Apex not long ago announced the acquisition of the potato chips and snacks business that the Madrid-based manufacturer Aperitivos Medina had been developing until recently. The purchase also includes all the machinery linked to the manufacture of chips and snacks from Aperitivos Medina, which will expand the manufacturing resources available to the Group of Navarre origin. Today, Grupo Apex already has eight work centers in Spain, six of which are factories. The operation responds to Medina's decision to focus exclusively on its dried fruit business, changing its company name to Frutos Secos Medina, SL In addition, this operation also responds to the announced continued growth strategy of Grupo Apex, which with this adds eight purchase operations in the last 10 year.

Plant-based Foods Manufacturer Saxon Acquired by Tuber Group

Tuber Group, based near Hull, has acquired plant-based convenience foods manufacturer Saxon Foods from the Abbeydale Food Group, for an undisclosed sum. The acquisition, which was completed on November 5, 2021, broadens Tuber Group's offering. Following the purchase of the Saxon Foods business and its accredited BRC AA grade processing facility, Tuber Group will retain the Saxon Foods trading name, and all jobs at the North Lincolnshire site have been transferred to the new owner.

"Having started as a potato supplier, in recent years we have expanded our offering to include a diverse selection of fresh and frozen produce. […] We believe we are best placed to drive the company's continued development [i.e. Saxon Foods], taking it to the next level and adding significant value to the UK frozen food sectors with the benefit of our global procurement capabilities, as well as our plans for exporting added value cooked British potatoes products globally," Steven Humphrey, managing director of Tuber Group, said.

Two Pulsemaster 100 kW Systems to be Sold to Agristo



Pulsemaster agreed to the sale of two 100 kW Pulsed Electric Field systems to Agristo, a major producer of French fries and potato specialties. Agristo has purchased two more Pulsemaster PEF-systems that can be used to treat whole potato tubers at a capacity of up to 60 tons per hour per PEF-system, to make French fries and potato specialties. The pulsed electric field treatment contributes to cell breakdown in the processed potatoes, which results in several benefits for the customer.

"Our typology is a Marx solid-state pulse generator with rectangular, unipolar pulse wave shape, based on the result of our experience designing, building, and manufacturing PEF-systems for a broad spectrum of applications and outputs in the food and beverage industry worldwide. Each Pulsemaster PEF system is built with the highest quality German and Dutch engineering to withstand continuous operation in Industry. We are pleased to be partnering with our customer Agristo in these important projects to make high-quality French fries and potato specialties," Werner Kohorst, Technical director of Pulsemaster mentioned.



Complete Potato Chip Solutions **designed for your business**

- Potato Handling & Storage
- Peeling, Grading, Washing
- Electroporation
- Frying & Oil Management
- Salt & Seasoning Application
- Conveying, Sizing & Accumulation
- Energy & Pollution Control








Across industries and applications, we design specialised solutions.

Bringing together leading brands in processing and packaging equipment for the potato chip industry. Our solutions set the standard for yield, efficiency, and safety while producing the highest quality potato chips. Whatever your product needs, we can meet it with precision and passion.

HEAT AND CONTROL | FastBack | SPRAY DYNAMICS | MASTERMATIC

info@heatandcontrol.com | heatandcontrol.com

Efficient Frying:
How to Save Valuable Resources in Potato Processing

Societies all over the world use frying to add flavor, color and texture to a wide variety of foods. Despite its popularity, frying on an industrial scale can be a costly business. From preparing raw ingredients, to heating large quantities of oil batch after batch, every stage of the potato processing journey presents a challenge when it comes to optimizing water, energy and oil usage.

by Tudor Vintiloiu

*Arnaud Jansse, Applications Engineer, **tna solutions** shared for Potato Processing International some of his company's expertise on optimizing resource-consuming processes in potato production.*

SIZING UP THE ISSUES

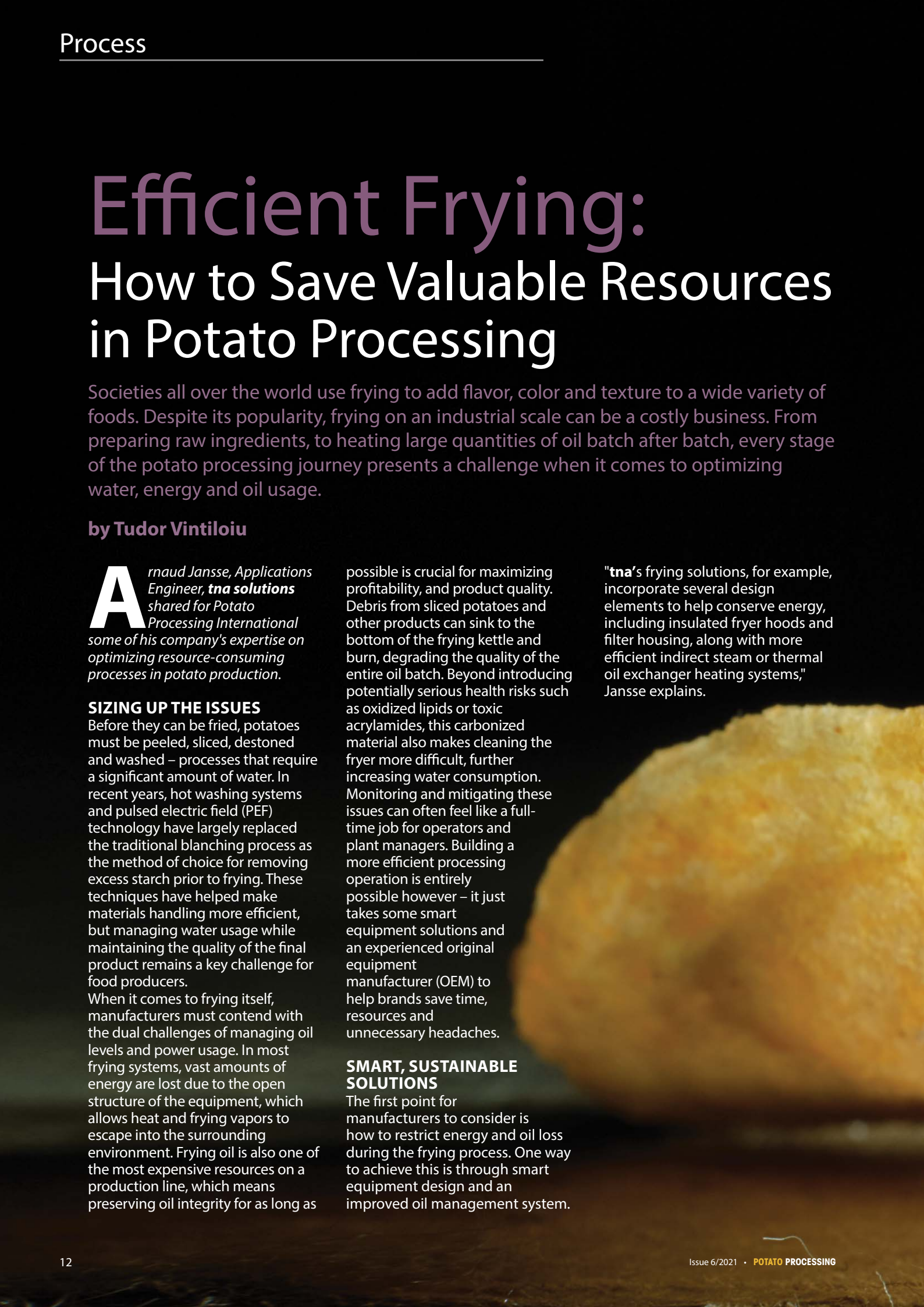
Before they can be fried, potatoes must be peeled, sliced, destoned and washed – processes that require a significant amount of water. In recent years, hot washing systems and pulsed electric field (PEF) technology have largely replaced the traditional blanching process as the method of choice for removing excess starch prior to frying. These techniques have helped make materials handling more efficient, but managing water usage while maintaining the quality of the final product remains a key challenge for food producers.

When it comes to frying itself, manufacturers must contend with the dual challenges of managing oil levels and power usage. In most frying systems, vast amounts of energy are lost due to the open structure of the equipment, which allows heat and frying vapors to escape into the surrounding environment. Frying oil is also one of the most expensive resources on a production line, which means preserving oil integrity for as long as possible is crucial for maximizing profitability, and product quality. Debris from sliced potatoes and other products can sink to the bottom of the frying kettle and burn, degrading the quality of the entire oil batch. Beyond introducing potentially serious health risks such as oxidized lipids or toxic acrylamides, this carbonized material also makes cleaning the fryer more difficult, further increasing water consumption. Monitoring and mitigating these issues can often feel like a full-time job for operators and plant managers. Building a more efficient processing operation is entirely possible however – it just takes some smart equipment solutions and an experienced original equipment manufacturer (OEM) to help brands save time, resources and unnecessary headaches.

SMART, SUSTAINABLE SOLUTIONS

The first point for manufacturers to consider is how to restrict energy and oil loss during the frying process. One way to achieve this is through smart equipment design and an improved oil management system.

"**tna's** frying solutions, for example, incorporate several design elements to help conserve energy, including insulated fryer hoods and filter housing, along with more efficient indirect steam or thermal oil exchanger heating systems," Jansse explains.



Producers should also look for frying equipment that includes advanced continuous oil filtration systems that help remove product debris and preserve oil integrity for longer. As part of this process, filtered oil is blended together with fresh oil and pumped back into the system to keep the fryer at the optimal capacity. This technique not only helps to restrict unnecessary oil waste but also enables producers to recover resources during processing.

One of the key challenges to improving resource efficiency in potato processing is that a substantial amount of energy is required to dehydrate the blanched potato pieces after washing - up to 25% of which is lost to evaporation as steam. By recovering this wasted heat as water through a condensing system, plant managers can save on both power and water consumption, recycling energy back into the production process. Energy recovery systems can also help producers to recoup and re-use the emissions generated during frying, to create a more circular and sustainable production line.

"With the heat recovery system utilizing the vapors from your frying system, you can harvest up to 85% of the energy from the fryers to run the drying system and other systems in your production."

Magnus Kalling, Technical Manager, Rosenqvists Food Technologies

CLOSING THE LOOP

It takes a lot to turn the humble potato into the chips, fries and other golden crispy products consumers know and love. By implementing the methods above, producers can go a long way to optimizing the efficiency of their potato processing operations, but there is still plenty of room for improvement. "At **tna** for example, we're exploring the potential benefits of improving insulation across our oil circulation piping and fryer kettles to help further minimize heat loss. As awareness of the climate emergency grows, alternative renewable energy sources for steam heating systems are also becoming a key area of focus. As a result, the future of frying is looking clean, green and more efficient than ever," Jansse concludes.

Magnus Kalling, Technical Manager, ***Rosenqvists Food Technologies*** *walked us through his company's most recent approach to saving resources during the frying process - in the form of their new belt drying system.*

Energy cost is an important factor to control when producing French fries. Removing so much water in the drying and frying step, requires energy. Considering the environmental challenges of today and the energy prices, re-using energy from the processing line will be an even more important goal in the green factory. There are cost savings to be achieved and a carbon footprint to be minimized. For the purpose of heat recovery, **Rosenqvists Food Technologies** introduced a complete system for re-using the energy from the frying systems. "A condenser is installed turning the hot fryer vapors into hot water. The hot water can then be used to run the drying system, blanchers and/or other systems you

"tna's frying solutions incorporate several design elements to help conserve energy, including insulated fryer hoods and filter housing, along with more efficient indirect steam or thermal oil exchanger heating systems."

Arnaud Jansse, Applications Engineer, tna solutions

need hot water for in your plant. Pay-back time for the heat recovery system depends on the energy prices you experience. You can expect a return of investment in one to two years," the specialist explains.

With the introduction of the new belt drying system, Rosenqvists Food Technologies can offer a full range of drying modules for capacities ranging from 2 tons per hour up to 25 tons per hour. The system can be driven by hot water or steam and is easily expanded with additional modules. The hygienic design and control of humidity, air flow and temperature in each individual module offers improved functionality. By adding a heat recovery system backing up your drying system, significant cost savings can also be realized.

HEAT RECOVERY FROM THE FRYING SYSTEM

"With the heat recovery system utilizing the vapors from your frying system, you can harvest up to 85% of the energy from the fryers to run the drying system and other systems in your production," according to a recent company press release.

Having in mind both hygiene and energy efficiency, the Rosenqvists engineers developed the new belt drying system with a modular system, offering maximum flexibility and control.

"We can offer width up to four meters wide belts. Each module is controlled individually allowing you to control drying recipes completely. All heating coils – using water or steam – are located outside the product zone and are easily accessible for maintenance. The belt dryer is offered with a fully integrated CIP system. With the latest design changes for improved hygiene, we feel confident cleaning is made easier and we have greatly reduced the risk of any bacterial growth," the company's representatives also mentioned.

DESIGN IMPROVEMENTS IN THE NEW BELT DRYING SYSTEM

The complete re-design of the belt dryer has secured some important

features for improved hygiene and cleanability. All surfaces inside the dryer are sloped to one drainage point ensuring removal of water inside. Welding and details are specially designed for optimal hygiene with minimum risk of bacteria growth.
Non-sticking side blocks can be rotated for inspection after cleaning. The company's designers made sure that the cleaning program could reach behind side blocks and other parts of the dryer. The support strips for the belt are replaced easily. The eye-link belt is continuously cleaned by high-pressure nozzles to remove debris.
"All heating coils are located outside the product zone achieving a clean passage for the product where the only focus is humidity, airflow, and desired temperature. The coils can be accessed easily for maintenance purposes. Standard options to run the heat exchangers with hot water or steam are available. The option of using hot water will require a lower drying temperature and consequently a larger drying surface. On the other hand, hot water heat exchangers offer exciting opportunities for heat recovery. Long-term, this can be a profitable investment," the engineers added. •

PEF system in use in French Fries industry

Advantages of Pulsed Electric Fields (PEF) Processing

PEF application causes electroporation, a non-thermal effect forming pores in cell membranes. The principle of action is long known, but only in the last decade it has found broad use in vegetable processing industry. With 200 Elea PEF systems used in food industry Elea is the market leader in this field.

By Stefan Toepfl, Elea Technology GmbH

This expert view will provide a brief history of PEF use, discuss process and product benefits for potato industry, look into equipment design and give an outlook in upcoming application opportunities.

THE EARLY DAYS

As far as we can tell fist reports on PEF use date back to the 1960s, where researchers in Germany and the Ukraine have observed cell disruption and improvement of mass transport and separation processes. In the 1980s industrial scale prototypes have been erected for fish meal processing, but pulsed power switching technology was not developed far enough. The technology took a step back and into research labs. In the 1990s universities including Ohio State University, Washington State University and Berlin University of Technology ran public funded projects on PEF use for microbial inactivation and plant cell disruption. Around 1997 first reports on PEF impact on potatoes, carrots or sugar beets have been published. Loss of turgor pressure and tissue softening have been observed making use of textural analysis.

First uses in potato processing

In 1998 technical scale systems have been developed for continuous testing in potato starch industry. Early designs used gravity as a transport means, but very fast it has become obvious that forced product transport is required and water wheel and conveyor belt systems have been tested. Making use of horizontal or vertical electrode configuration treatment belts has shown high process performance, reliability as well as cleanability. In 2006 an industrial scale system has been installed in French Fries processing, this is where it all began. Since then, turnkey, industrial PEF systems have been developed at the German Institute of Food Technologies (DIL e.V.), Germany. In 2012, Elea was founded as a spin-off dedicated to marketing PEF technology. With 200 systems installed that start-up has turned into the market leader with a network of regional agents and technology partners.

Product benefits for French Fries

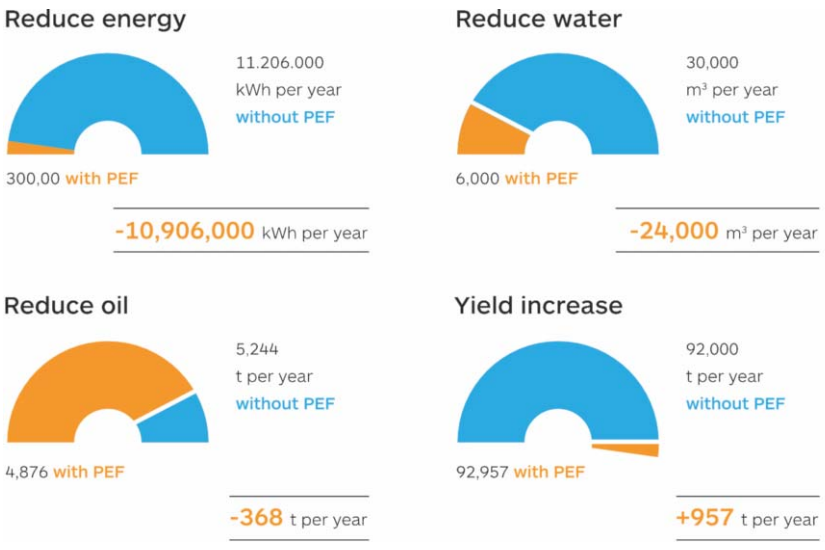
Potato tubers soften after a PEF treatment, as the internal cell pressure (turgor) is lost. Like after preheating, the texture softening improves cutting and results in less feathering and breakage. In comparison to preheating

PEF system in use in potato chips industry

PEF energy and water consumption are reduced by up to 90 %. Typical energy input for a PEF processing of potato tubers is 0.3 to 1.5 kJ/kg, corresponding to a temperature increase of 0.01 to 0.4°C. Process intensity is adapted during the season, being highest with fresh from the field crop or harder tuber varieties and lower at the end of the season. Average product length is increased, and the starch loss into cutting and blanching water streams is reduced. That causes an up to 1.5 % yield improvement for a French fries processing line. Due to less tissue breakage the oil uptake during frying is reduced by approximately 10 %. As the electric field effect is instant and volumetric, there is no holding time requirement and no start up or shut down time need. Today approx. 140 Elea PEF systems are in use in French Fries industry with processing capacities from 5 to 75 t/h. Recent projects are increasing treatment capacity up to 100 t/h on single lines or treatment of other raw material such as sweet potato or cassava.

FRY THE PERFECT CHIP

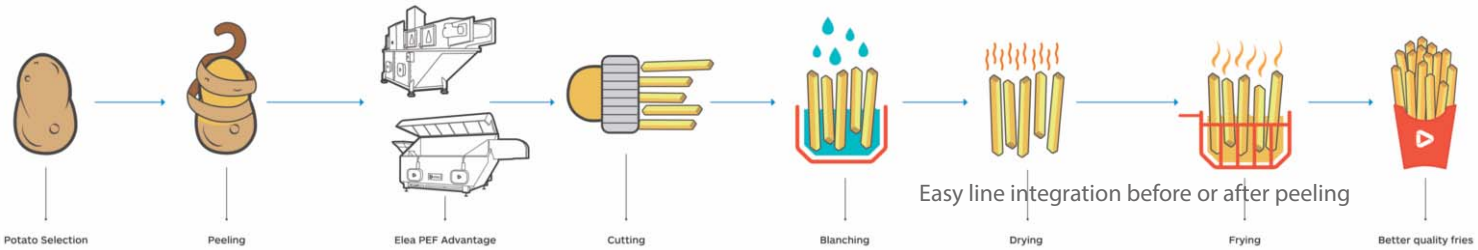
Potato and vegetable chips processing is dependent on high quality raw material and optimized processing. Slicing quality and consistency are key factors, as performance of subsequent processing steps and product quality depend on them. During slicing of potatoes as well as other vegetables PEF reduces tissue breakage and the number of fines and broken particles. A smother cut surface will reduce starch loss and the extent of free starch on product surface. This is beneficial for product yield and texture, as well as to reduce product stickiness and doubles during frying. Keeping starch in the slices contributes to improved texture and crunch. With reduced starch loss and improved cutting up to 2 % yield increase can be achieved. Due to faster release of water frying temperature and / or time can be reduced. On continuous frying lines – dependent on line setup - up to 10 % frying time reduction is possible, which in combination with a reduced final frying temperature results in less heat load and increased product quality. For batch frying up to 15 % capacity increase can be achieved due to facilitated moisture removal. Most potato chips lines do not include a blanching step, but where applied PEF can help to revert undesired effects of blanching on product texture. Less slice surface damage will result in less oil uptake, approximately 10 % for typical product and frying conditions. For raw materials such as carrots, parsnip, sweet potato or cassava similar benefits are observed. PEF will improve product cutting and allow faster water removal and reduced oil uptake. Reducing frying time and temperature will allow lighter product color and more natural product appearance. At present approx. 40 Elea PEF systems are in use in snacks industry, ranging from 1 to 12 t/h treatment capacity for single lines or up to 28 t/h where multiple slicing and frying lines are combined.



PEF sustainability - 26 th raw material French fries line, 7.700 production hours/year

EQUIPMENT DESIGN AND LINE INTEGRATION

For industrial scale potato processing continuous PEF systems are used. They consist of a pulse modulator for energy supply and a treatment unit. System power and mechanical design are dependent on processing capacity needs. Electric field strength (~1 kV/cm) and specific energy input (0.3 to 1.5 kJ/kg) are key process and design parameters. The field strength defines the maximum chamber aperture, energy input and throughput determine the average power rating. To allow hassle free product transport the treatment chamber cross section should be wide and free of obstacles, it´s dimensions determine the system peak power rating. Dependent on average and peak power requirements current pulse generators are either based on pulse transformer or Marx generator design. Pulse transformers allow a smaller footprint, but peak currents are limited to 1 - 2 kA. Due to their higher peak currents of up to 10 kA Marx generators allow wider treatment channels and are preferred for higher



throughputs. For solid products such as roots or tubers belt systems have shown best performance and reliability with constant treatment intensity over varying throughput or product size. Water is used for energy transfer, to control treatment efficacy and reduce water requirements process water quality is continuously monitored and managed. Dependent on treatment capacity and generator power ratings both horizontal and vertical electrode configurations can be used. Whilst PEF works peel on or off, most systems are installed after peeling, where subsequent hydrojet cutting or slicing benefits from improved consistency and longer knife durability. For larger scale installations pulse generator and treatment unit are separated to ensure small footprint within the actual processing line. To suit the demand in snack sector, Elea has designed a dedicated, compact all in one unit with treatment capacity of up to 9 t/h. This allows easy implementation into existing production lines.

PROCESS CONTROL AND OPTIMIZATION

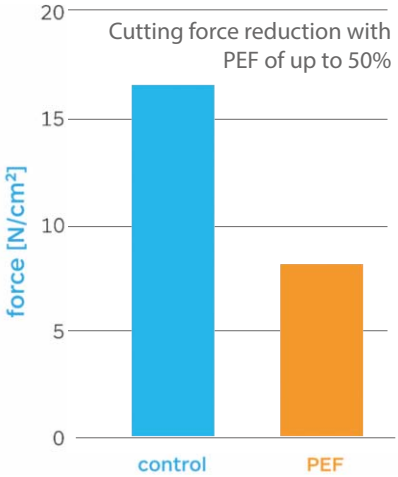
With increasing PEF energy input pore size increases and besides water also sugar or starch are released. The more the better is not the right approach here, as that may cause undesired solids and yield losses. For process monitoring and optimization Elea has developed two tools, PEF Control and Cut Control. PEF Control is based on impedance measurement to detect the number of open cells in a tissue and to predict mass transport improvement e.g. in extraction, infusion or drying processes. Cut Control measures compressing and cutting force for tubers and hence allows selection of suitable processing parameters dependent on raw material variety, season and desired cut. Together with our clients as well as line integrators we have run in person or remote supported installation and line optimization projects. Making use of our own video support app the process is handled from first trials in pilot scale through proof of principle testing at place to system installation, startup and commissioning. Remote diagnosis and support are available for customer service as well as product development. When integrating a PEF system into turnkey projects or for retrofit, our team of experts is available to maximize overall line performance by optimization of process equipment and settings on all stages of the production line.

SUSTAINABILITY IMPLICATIONS

With an energy requirement of approx. 1 kWh per ton of product, PEF is the most efficient cell disruption technique. PEF water usage ranges from 30 to 50 l per ton of product, dependent on infeed water and product conductivity. To minimize water use soil or free starch should be removed prior to entering the treatment bath, after treatment the process water can be reused in other process stages. Several PEF users have run and published sustainability analyses after PEF implementation. For a typical 26t/h line water savings in a range of 24.000 m3 and energy savings of 10 million kWh per year have been reported. Those savings in combination with a yield increase of approx. 950 t and an oil uptake reduced by 368 t per year help to save money, resources, and the environment.

WHAT´S NEXT AND WHERE TO TRIAL?

Our PEF experts work closely with clients to provide tailor made solutions to best suit individual requirements. Current work focuses on process optimization and new product development for new product shapes or using so far underused crops. PEF enhanced infusion and uptake of color, flavor or active ingredients allows to impact on product taste and appearance. It cannot only be used for tissue softening, but with thermal treatment can be used to preserve tissue texture by targeted pectin modification. That allows reducing texture degradation during cooking or canning of potatoes and other vegetables. And finally, combinations of PEF and vacuum frying or microwave vacuum drying allow the creation of novel, tasty and crunchy product textures. The Elea pilot hall in Quakenbrück, Germany is available to develop the best solution for your potato product. Making use of our network of regional agents and technology partners demo activities at place as well as on-site-trials in your production can be arranged. •



PEF Pilot system for trials and Product presentation during Elea PEF Advantage Day

PROCESSES

PRODUCTS & INGREDIENTS

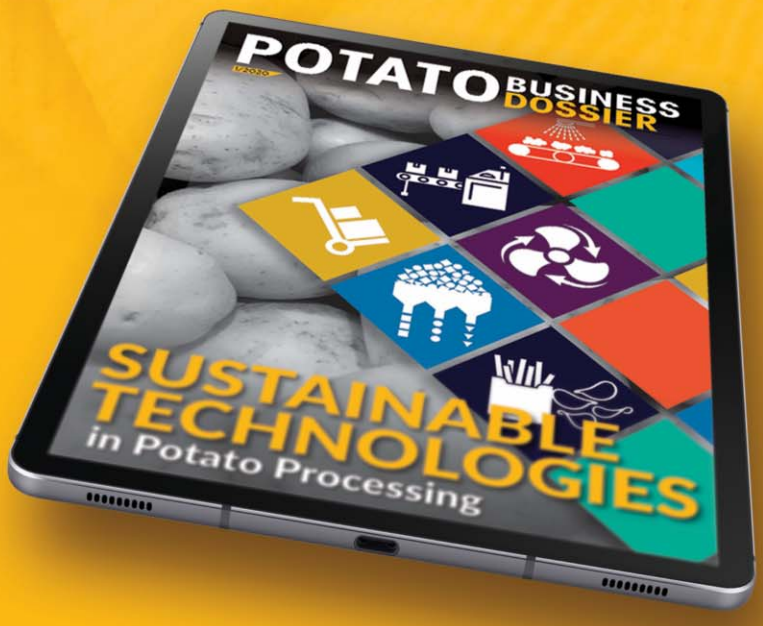
MARKETS

PACKAGING

AGRO & STORAGE

you always know
when you need to know more

POTATO BUSINESS DOSSIER



4 **times a year**

POTATO BUSINESS DOSSIERS

are added-value online products, filled with useful information and rich reports on potato industry topics. Access your complimentary copy on **potatobusiness.com**

FAM

www.fam.be | info@fam.be

FAM focusses on the development of industrial cutting machines for the potato industry. We provide customers with the innovative, groundbreaking solutions they need for the cutting, slicing and dicing of potato chips and French fries. Over the past 60 years, we established a long-lasting close cooperation with highly reliable influential clients and partners in the industrial potato processing market. We are present in all continents, with customers experience centers, stocks and service.

FLO-MECH LTD.

www.flo-mech.com | enquiries@flo-mech.com

With over 40 years of experience, Flo-Mech Ltd is a leading supplier of equipment to the food processing industry, providing a complete range of products and worldwide turnkey project management solutions including: Complete snack processing lines, Flo-Starch™ – Starch and water recovery systems, Flo-Therm™ – Oil heating systems with pollution control, Flo-Cut™ - Potato grading/halving equipment, Flo-Peel™ – Peeling systems, Flo-Flavour™ – Flavoring systems, Flo-Filter™ – Oil Filtration systems & fryer chimney filter systems, Flo-Dry™ - Energy efficient snack drying systems, Health & safety management, Energy & sustainability management.

Heat and Control

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.

Kiremko B.V.

www.kiremko.com

Kiremko is a Dutch company founded in 1965 and based in the Netherlands. 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.

Kuipers Food Processing Machinery

www.kuipers.nu

Kuipers Food Processing Machinery engineers and manufactures high-end, innovative snack processing technology for products such as nuts, pellets, extruded snacks and chips. The company is a known specialist when it comes to frying systems and delivering turnkey lines for snack production. Since 1985, Kuipers has supplied food plants to more than 60 countries worldwide. The company's systems help small food producers, as well as multinationals, manufacture the tastiest snacks on the market in the most efficient manner.

Optimum Sorting

www.optimum-sorting.com

Optimum Sorting is specialized in the development, assembly, demonstration, sales and maintenance of optical sorting & measurement systems for food and non-food applications. All systems are based on the use sophisticated metal detection or camera- and laser technology. The headquarters is in Hasselt (B) with subsidiaries in Eindhoven for our EMEA markets, a Denver Sales and service office for our USA customers and an office in Thailand for the Asian territory. Today active in 40 countries with a very customer centric approach with our local partners and OEM'ers.

Rosenqvists Food Technologies AB

www.rosenqvists.com

Rosenqvist Food Technologies AB, 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. At Interpom, we are launching our latest belt dryer design, which is a fully modular system with effective belt width up to 4 meters. Extra attention is put on hygiene and energy efficiency. All heating coils (using water or steam) are located outside the product zone. The belt dryer has a fully integrated CIP- system. We display our latest developments in coating systems (aligning conveyor, batter applicator, settling conveyor and infeed belt) and double frying systems for capacities up to 25 t/h. The special fryer design minimizes the total volume of oil, ensures full laminar oil flow and provide accurate oil filtration. For potato specialities, we will show our fryers with unique systems and solutions for oil level and oil flow control. Fryers with capacities up to 8 to 9 t/h of finished product.

Stumabo International

www.stumabo.com

For more than 65 years, Stumabo International have been designing, manufacturing and selling innovative industrial precision blades for the cutting of potato chips and French fries, covering both food processors and machine manufacturers. With an annual turnover of close to 3 million blades, Stumabo is a well-reputed, leading supplier, active worldwide. We are proud to serve both local processors and wellknown international customers in five continents.

Tummers Food Processing Solutions

www.tummers.nl

Tummers Food Processing Solutions organizes innovative solutions around the world for processing potatoes and tubers from land to customer. We can do everything from A to Z for you as our customer, thanks to our extensive range of machines, our wide-ranging service provision, but most of all due to the way in which we work together with you. The company has become a leading manufacturer of machines, machine parts and complete production lines for potato and vegetable processing. The Tummers Group currently consists of four companies with more than 100 employees and it operates all over the world.

URSCHEL

www.urschel.com

As the Global Leader in Food Cutting Technology, Urschel continues to lead the world in the manufacturing and selling of commercial cutting equipment to food processing and allied industries. Founded in 1910 by inventor William E. Urschel, the company has continued to expand throughout its 109-year history keeping pace and adapting to the everchanging needs of the marketplace. Increases in productivity, energy-saving machinery, cleaner, more precise cuts, and developing new cut shapes, are just a few ways Urschel continues to rise to the demands of this dynamic industry.

PEF Power Optimizes Production Process

Pulsed Electric Field (PEF) treatment in potato processing continues to gain popularity for its significant advantages over traditional thermal processing methods. The application of PEF to a potato is a cell disintegration technique and it can be used in place of blanching (for PC) and pre-heater operation (for FF).

by Heat and Control

The PEF method of processing potatoes uses brief pulses of a strong electric field. It is a unique nonthermal method of creating micro holes in the potato cell wall, referred to as 'cell permeabilization'. Permeabilizing cell membranes enables tissue softening which is what ultimately delivers the many valuable advantages of this method to potato processors, such as improved cutting of potatoes, higher product quality, increased process yields and reduced operating costs.

Potatoes are considered excellent conductors because they're uniformly solid, contain around 80% water and are rich in potassium. This is what ultimately allows them to be efficiently treated with the high voltage pulses in PEF application.

Originally used in the MedTech sector, PEF treatment is now breaking new grounds in the food industry. Potato processors are starting to recognize the many benefits this technology has to offer and how adopting it can optimize their production process. In addition to that, the technology can also open the door to a wider range of raw ingredients and product characteristics.

Through PEF processing, osmotic pressure or 'turgidity' is reduced by permeabilizing cell membranes. This makes potatoes more homogenous which results in the reduction of seasonal variation and allows a wider range of raw potatoes to be processed. Micro holes in the cell walls allow sugars and asparagine to be washed out of potato slices when they're in a cold-water wash. Potatoes treated using PEF technology achieve a much more consistent finished product color, and significantly reduced acrylamide levels, without the need for blanching prior to frying.

Potato processors who adopt PEF treatment make significant cost savings by removing the need to blanch potatoes. Softening the potato tissue also allows for a smoother cut, at an optimal product texture, which in-turn reduces wear on cutter blades. Reducing starch loss during this part of the process increases a processors overall yield. The smoother surface achieved by the improved cut means less oil pick-up during frying and which results in a far better-quality product.

Processers running French fry lines report that the improved cutting achieved by using PEF delivers a significant reduction in feathering and that the softened raw potatoes are also much more flexible, which leads to a significant reduction in their product's breakage. This ultimately allows them to produce longer, thinner French fries without any loss to the product's texture. PEF treatment also allows them to reduce their water and energy consumption.

PEF Q&A

1. What products/applications is PEF suited for?

French fries, potato chips, formed potato products, and root vegetables.

2. Why is PEF a superior process to regular blanching?

Traditional potato processing methods typically see slices from storage potatoes blanched prior to frying. The issue with blanching is that a significant loss of starch occurs during this process which equates to reduced yield. In addition to this, reduction in finished product texture (inferior quality) sometimes requires re-texturing in a brine dip prior to frying and increased costs for energy, salt and extra processing. In most cases, A PEF system reduces or eliminates the need to blanch the potato prior to further processing. In the case of French fries, a PEF system replaces the pre-heater prior to slicing, providing significant energy/cost savings.

3. Who's using PEF and why?

PEF technology is currently used by some of the larger players in the potato processing industry globally, and those who are not currently using it, are looking into it. The adoption of PEF treatment allows potato processors to respond to consumer demands for greater choice, better quality products, and healthier alternatives. It is also a way for them to optimize their potato operations.

Both French fry and potato chip processors acknowledge the many benefits of this technology. Prior to adopting a new PEF system, potato chip processors often report issues such as the level of acrylamide in their potato chip products.

Regulatory measures in Europe set benchmark acrylamide levels of no more than of 750ug/kg.

European potato processors are expressing interest in Heat and Control's own PEF treatment solution as a way to reduce the Acrylamide in their potato chip products, because they are exceeding the set benchmark, or close to exceeding it.

French fry processors using Heat and Control's E-Flo system report less product breakage and shattering, and that they are able to produce longer and thinner French fries, with smooth surfaces and sharp edges.

4. Global food industry market for PEF systems

Adoption of PEF systems (as an alternative to thermal pasteurization) and for it's many additional processing benefits, is creating sizable demand for this technology in the food industry. The development of new PEF technology is a driving factor behind food industry PEF systems market growth, and we expect demand for this technology will continue to grow.

A recent report by Technavio (January 2020) stated that the global food industry pulsed electric field (PEF) systems market is poised to grow by USD 227.52 million during 2020-2024, progressing at a CAGR of about 24% during the forecast period.

We expect there will be emerging markets for PEF systems in countries where potato agronomy faces challenging conditions such as India, Egypt and other similar regions. Challenging crop conditions experienced in these locations often means a processor must blanch their potatoes for large parts of the year. It is processors such as this, who would see a very fast ROI from reduced energy costs if they were to adopt a new PEF system. In some cases producers could see a ROI of less than 2 years based purely on energy savings during blanching, with the E-FLO providing added benefits of significant increase in yields and better quality product.

5. Specific benefits of PEF for potato processing

Both French fry and potato chip processors experience a significant range of benefits when incorporating PEF technology into their production processes.

- *Product Quality*

A product processed using PEF technology experiences both structural and textural changes which ultimately allow the product to achieve a cleaner slice. Due to the retention of starch in the surface layer of the chip the finished product has a crunchier texture.

- *Yield improvements*

Processing equipment which incorporates PEF technology can lower the cost of processing and deliver significant line yield increases. Softer potato tissue makes the product easier to cut which results in faster processing speeds, higher slice yield and a longer blade life. Less pressure on equipment means less downtime for maintenance and fewer blade changeovers.

- *Reduced Blanching*

The benefits of this processing method have seen many food processors, across various industries incorporate PEF technology into their processing lines. Blanching leads to starch loss which can decrease yield. Because the tissue of a potato processed with PEF technology becomes more permeable, the need to blanch it, prior to cooking, and the length of time required to blanch it is reduced.

- *Reduced acrylamide levels*

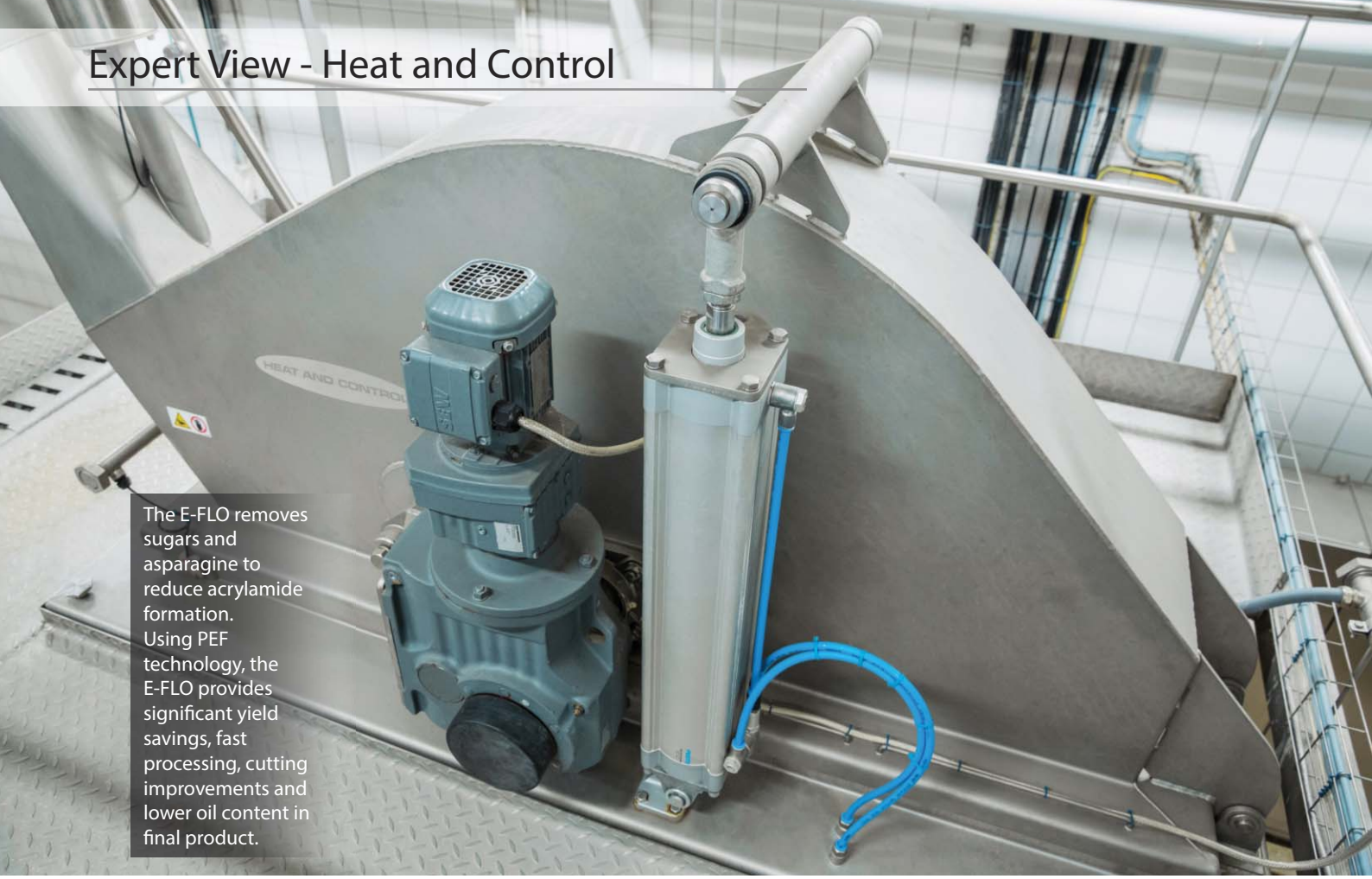
PEF technology allows the removal of sugars and amino acids, which are the key contributors to Acrylamide in potato chips, in a cold water wash. In some processing equipment this can reduce acrylamide levels in potato chips by as much as half.

- *Reduced oil pickup*

The smoother product surface provides lower surface to volume ratio of the chip and less surface area so the product absorbs less oil during cooking.

6. Discuss the environmental impact of a PEF system?

PEF is setting new standards in French Fry and potato chip production. A PEF system is much more energy efficient than any prior technology. Blanching can use several thousands of kW of steam to achieve a similar result as the Heat and Control E-FLO system can with a 60 kW pulse generator. In addition, the increased yield



The E-FLO removes sugars and asparagine to reduce acrylamide formation. Using PEF technology, the E-FLO provides significant yield savings, fast processing, cutting improvements and lower oil content in final product.

achieved from the process means less starch lost to waste. Processors using PEF technology require less water turnover in equipment meaning less water used.

7. Does it integrate easily with existing equipment?

It is relatively easy to integrate a PEF system such as Heat and Control's E-Flo, into existing lines. It is a stand-alone piece of equipment which does not require much customization but the equipment used to feed and remove product from it can be highly customized depending on the existing line.

8. Where in the processing line is PEF incorporated?

PEF is incorporated immediately prior to slicing.

9. Is post installation support required?

There is no special post installation support required for the Heat and Control E-Flo. Electrodes will require replacement every 1-2 years, but these items can be purchased as spare parts and are easily installed by site maintenance.

THE HEAT AND CONTROL E-FLO® ELECTROPORATION SYSTEM

After extensive research and development, Heat and Control brought to market their own PEF system to apply Pulsed Electric Field (PEF) processing to potatoes.

The Heat and Control E-FLO® Electroporation system was originally created as a solution to reduce acrylamide, without degradation to the original taste and texture of the product, the technology also provided additional benefits of increased line efficiency and reduced operation costs.

As explained above, PEF sends a pulsed electric field through the cell walls of a potato (or root vegetable) to perforate its cell membranes with microscopic holes. This allows sugars and asparagine to be released from the vegetable before its cooked, thereby reducing harmful acrylamide.

Peeled and washed potatoes are supplied in measured quantities by upstream equipment and delivered to the E-FLO equipment's infeed chute. The rotating E-FLO wheel transports potatoes through the processing area as a compact packed bed through a water bath. Processing takes place in a water bath so that the electrical pulses can influence the product as desired. After a short exposure to the electric field pulses, to perforate the cell walls, the potatoes are lifted and discharged from the water bath by the continuing rotation of the wheel into the discharge chute. The potato then continues down the production line where greater amounts of sugars and asparagine can be removed during the slicing and washing stages. Pulsed electric field treatment typically reduces fat content of the final product due to increased starch content in the outer cell layers of the potato slices and smoother surface after cutting, which enhances the oil drip-off effect after frying.

Heat and Control has been setting benchmarks in food manufacturing process efficiency for over 70 years and our French fry and formed potato product systems are the industry benchmark. We process a broad range of styles, including straight cut fries, crinkle cut fries, curly fries, potato wedges, and variety of potato co-products. Our industry leading equipment delivers processing efficiency through optimization and seeks to reduce wastage of raw materials and energy. •

For more information on the advantages of PEF or the E-FLO Electroporation system, get in touch at info@heatandcontrol.com or visit www.heatandcontrol.com

[frozen food dossier]

Click it or flip it: read, discover and lead!

ON-LINE

version available on
frozenfoodeurope.com

PRINT

hardcopies available complimentary
to **Frozen Food Europe** magazine

2 times a year
STATE OF THE FROZEN FOOD INDUSTRY
is a project which contains reports on the most important frozen food categories, as well as technical equipment innovation related to product manufacturing, published both in print and on-line.

COVID Still Looms Large

The potato markets across the world are wary that restrictions may be enforced again. COVID-19 is back on the agenda, despite some very encouraging figures for the export of frozen product and factory activity back to full production.

By Tudor Vintiloiu

"Overall, now that lifting has almost finished, top-up supplies for processors need to come from store and growers are slowly forcing prices higher in the range. Export demand remains steady, with values broadly unchanged," according to the latest Irish Farmers' Association (IFA) report.

"AN AIR OF UNCERTAINTY REGARDING MARKETS"

Due to rising COVID-19 cases, there is an air of uncertainty regarding markets at present, according to the same report. The quality of the material is reported to be very good, with the general narrative that yields are average. Input costs, particularly fertilizer and energy, are gaining a lot of attention in the past week. Energy costs will be significant for growers with potatoes in store over winter.

POTATO CHIPS

In 2020, the global potato chips market size reached a total of USD32.2bn, with the industry likely to grow with a compound annual growth rate (CAGR) of 3.92% from 2020-2028, to achieve USD43.8bn by 2028.

The Potato Chips Market Global Forecast 2021-2028, by Research And Markets, whose abstract was recently published shows that in 2019, the outbreak of COVID-19 had a significant impact on Global Potato Chips Market.

According to the report, some of the main reasons for the decline in the market amidst COVID-19 were the supply chain hurdles, which led to empty grocery store shelves at the beginning of the pandemic. Despite the disturbances in the supply chain of potatoes, the extorted lockdown around the world and widespread work from home scenarios actively supported the at-home food consumption and extension in snack stocks, which, in turn, augmented the demand for potato chips in 2020. Hence, the COVID-19 pandemic resulted in the generation of opportunities for numerous private players to arise in the markets to purvey the inflated demand for potato chips, the Research And Markets analysts explained.

ONLINE RETAILING CATEGORY, THE FASTEST EXPANDING SEGMENT

In this report, the analysts studied the global potato chips market by distribution channel into supermarket/hypermarket, convenience stores, and others. Due to the availability of bulk purchase discounts, the rapid expansion in the number of food stores, top quality chips at preferred rates, and the low danger of bad debts, supermarkets were found to hold

the most significant share.
"Due to factors such as the availability of a wide selection of flavors of potato chips and crisps, quick accessibility, and easy cost comparison across various types of chips, the online retailing category is expected to be the fastest expanding segment over time," according to the report.

ASIA-PACIFIC, THE FASTEST EXPANDING MARKET FOR THE POTATO CHIPS INDUSTRY

Based on geography, the consumption levels for potatoes chips vary extensively across regions and register a significant proportion in the salty snacks category. Changes in lifestyles, technological advancements, increased investments in developed countries of the region, and a growing taste preference contributed to the rise of the potato chips industry.
As such, Asia-Pacific is expected to

be the fastest expanding market for the industry, supported by surge incomes in developing countries such as India and China, younger population, and a choice for western lifestyles.

DEMAND FOR POTATO CHIPS CONTINUES TO RISE

Demand for potato chips continues to rise significantly worldwide with the emerging trend of westernization of food and

43.8

billion USD is the expected size of the Global Potato Chips market by 2028.

4.1%

is the projected CAGR of the NA Frozen Potato market from 2020 to 2027.

23.5

is the estimated size of the European Frozen Potato Market by 2027.

consumption patterns. Moreover, a growing economy, a rise in middle-class population, and increasing urbanization are other factors. Besides, with the increase of infrastructure development such as metro stations, cinema halls, airports, and others, the demand is anticipated to rise further in developing countries across the globe.

"The flavored segment is estimated to be the fastest-growing segment due to the factors such as choice and availability of flavor and growing demand in the young population inclination towards taste. In the coming years, the development of newer flavors to meet the taste bents of diverse consumers is the answer to surviving in the global potato chips market," experts also mentioned.

FROZEN POTATO ON THE RISE

North America and Europe accounted for a major share in the industry in the historical period and are expected to continue to be the leading regions in the forecast period. This can be attributed to the higher consumption rate of potato-based products and frozen foods in the regions. In the near future, the Asia Pacific region is expected to become one of the most profitable markets for frozen potatoes. The Asia Pacific frozen potato market is growing owing to the growing number of fast service restaurants (QSRs) in the region. However, the demand for frozen potatoes is increasing around the world, owing to an increase in fast-food restaurants, an increase in global food processing capability, rising disposable incomes, rapid urbanization, and lower tariffs on the import and export of frozen potatoes. The North American Frozen Potato market is expected to reach USD28,1bn by 2027 from USD20,6bn in 2019; it is estimated to grow at a CAGR of 4.1% from 2020 to 2027.

In 2019, the French fries segment held the largest share of the North America frozen potato market. Quick service restaurants are one of the major consumers of French fries and as the foodservice sector is on the rise, the demand for frozen French fries is also increasing around the world.

The frozen potato market in Europe is also expected to grow from USD 17,6bn in 2019 to USD23,5bn by 2027; it is estimated to grow at a CAGR of 3.8% for the forecast period.
The increased consumption of ready-to-eat and ready-to-cook foods has had a huge impact on the market for frozen potatoes around the world. According to new studies, frozen vegetables have more nutrients than fresh vegetables. Consumers are gradually becoming aware of this reality, which has begun to reflect in the demand for frozen vegetables, especially frozen potatoes. Sales in the frozen food sector are being driven by an increase in the number of women in the workforce, as well as the resulting time constraints and socializing at home. The growing acceptance of western culture in emerging nations and a rise in demand for freshly prepared food are expected to be the primary drivers for the expansion of the convenience foods category, which, in turn, is expected to support the frozen potato products industry in the forecast period.
Lamb Weston Holdings, Inc., McCain Foods Limited, The Kraft Heinz Company, J. R. Simplot Company, and Farm Frites International B. V., are among the leading companies in the North America Frozen Potato market. The companies are focused on adopting organic growth strategies such as product launches and expansions to sustain their position in the dynamic market. For instance, in 2019, McCain Foods USA Inc., a division of McCain Foods Limited, announced a USD300m investment in its Othello, Wash., potato processing facility, significantly expanding its North American production capacity.

CONCLUSIONS

Prior to COVID-19, total potato performance was seeing volume declines in retail and eating-out. Potatoes struggled as traditional meals lost share in favor of dishes from world cuisines. Cooking time was a barrier to in-home consumption, with fresh potato dishes, where the retail declines are coming from, taking nearly twice as long to cook and prepare, according to data from Kantar Usage.
During 2020, potatoes in retail grew significantly with volume growth of +13%, much faster than total food and drink at +11% (Kantar, 52 we 27th Dec 2020). All categories apart from chilled saw good levels of growth with the fastest growth seen for chips (+14.9%). Fresh potatoes also saw volume growth of +14.5% with 1.5 million tons being sold in retail over the year (Kantar, 52 w/e 27th Dec 20).
During lockdown, potatoes have benefitted from their versatility and price point.
As a result of these anticipated trends, total potato volumes for the full year 2021 are expected to be down -4% year-on-year but when comparing back to 2019, being a more typical year, volumes are up slightly at +1%. •

Christophe Vermeulen:

The Race to the Bottom Has to Stop

The 20th edition of INTERPOM, the trade fair for the entire potato chain, was finally held a year later on 28, 29 and 30 November 2021 in Kortrijk Xpo.

The event welcomed 11,768 visitors during the three days of the trade fair. This means that the number of visitors was lower than in the previous edition, but this was to be expected given the numerous measures, quarantines and complications in international traffic. This also affected the attendance of foreign guests, with fewer visitors from the Netherlands, Germany and other non-European countries.
The visitors present at the trade fair were mainly targeted professionals who had come to INTERPOM with clear objectives, investment plans and the desire to learn about the latest market developments in the potato chain. Christophe Vermeulen, Belgapom's CEO agreed to share some insights with Potato Processing International about the trade show and the organization's future strategy.

Tell us about this edition of Interpom and about how the industry in general feels about the COVID pandemic.
Well, of course there was a lot of anxiety for the last couple of weeks. I began this job in January of this year and we had already postponed Interpom from last year because of the pandemic - and the industry did not really like that because especially in COVID times we feel it is necessary to meet each other in order to do business. Like every other sector, the potato sector suffered in different capacities. First of all, it was the exports that declined at the beginning of COVID March last year, and then we saw a surge in consumer potatoes because everybody was at home.

Later on, of course, with the restaurants closing up, it was very difficult for some companies such as potato processors that could not market their products.
So there was an overcapacity of frozen product. The freezers were full and the processors could not process anymore because there was no export, so everything stopped, everything was stuck.
And we had declining prices for the farmers since they could not sell on the free market anymore because there was nothing to produce, nothing to process anymore.
In the end we made a deal with the industry last year that we were all going to fulfill every contract we had. So all the potatoes eventually found their way to market. And there was even a call from Belgapom for the general public to eat fries twice a week, which had impressive results.
Considering all that, we are very, very happy that this year we can get together at Interpom. Around 98% of the spots were filled, and in the last couple of weeks, there were just a couple of exhibitors that cancelled. But we still have 318 exhibitors and that was a big sigh of relief for everyone, actually. And as I see, looking around me, business is going steady and good. And that was what we wanted.

What can you tell us about the visitors? How do the numbers compare to previous editions?
Yesterday we had more than 5,000 people coming in, today I think it will be a bit more. But the people that are coming, are coming for a reason, they are coming with a fixed agenda. They know what they want to see and this makes it a very efficient fair. It's a super-efficient fair. It's still a networking occasion, but a more focused one, which makes the whole event safer.

So what would you say are some of the lasting changes that happened to the industry during this recent period?
When it comes to contracts, in January last year we started talks about the general code, which is the code that defines the contract relations between growers and processors. And there has been a big revision of that code and it all happened during the COVID crisis. That was very difficult and we made a lot of changes, but we finished and we have a very good product now. But the driving force behind this change was not COVID related. The problems that we had in the past with very dry years and difficult crops, with difficult yields, caused tensions between farmers and processors and we had to address that.



We've also had to face the end of CIPC use. This was the first big season without CIPC and there's been a growth in costs for farmers because they had to use other, more expensive solutions. And we tested a lot of potatoes as well. We had to, because of the fact that the temporary MRL for CIPC has to stay above the detection limit that is supposed to be 0.01. And now it's 0.4 and we needed to control that so all the barns had to be cleaned, and the potatoes tested.
With the prices in the contracts being made the year before, these extra costs will have to be factored in. And I'm not really sure how that will play out.

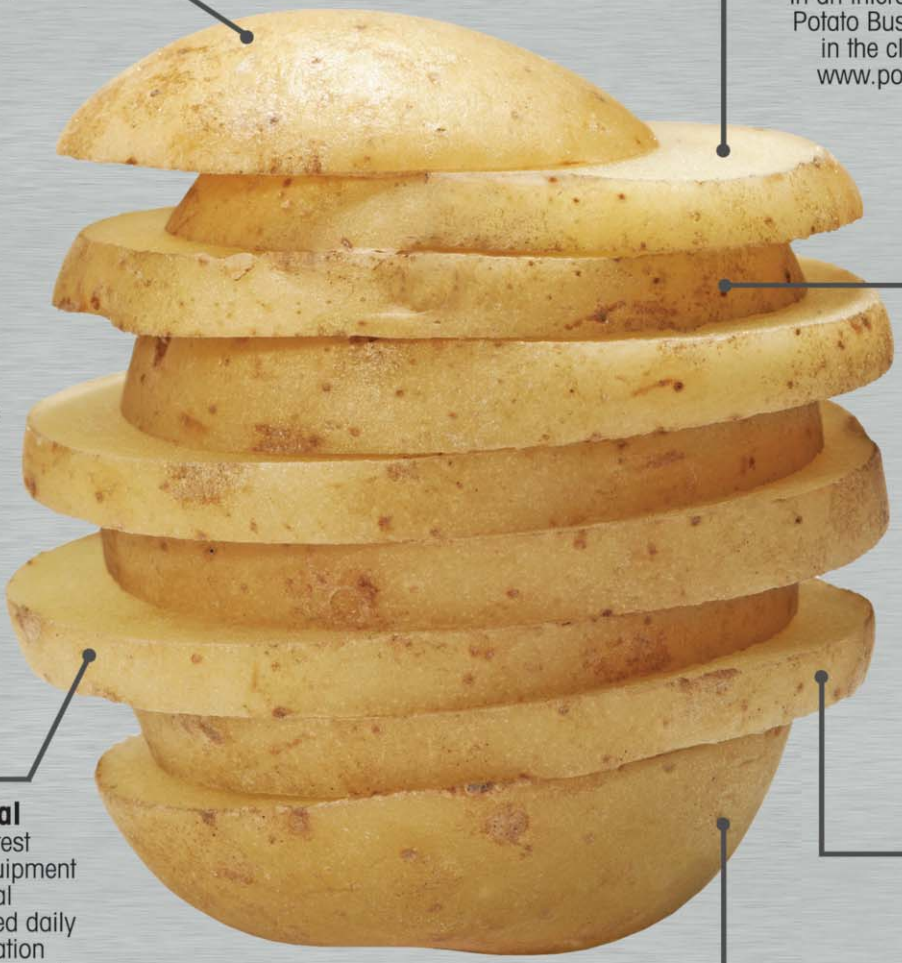
What would you say is going to be the biggest challenge for the industry in 2022?
The biggest challenge for the industry would be to survive another wave of COVID. Everything is more or less good right now, I think the industry is doing quite well. Demand is still growing, export is still okay. But things can change in a very short term depending on how this COVID situation develops. If we go through another lockdown, that could be catastrophic.
The weakest link in the chain was food service, because, of course, the restaurants could not stay open and people started working from home. When it comes to processed potatoes, we anticipated reaching 5.2, maybe 5.3 million tons of processed potatoes if it would have been a normal year without COVID. And in the end we processed a little over 5 million tons. So that's a loss of 300,000 tons, but actually all things considered it was quite good thanks to the exports resuming.
There has also been a slight loss in planted acreage. Between 7% to 10%. And on the Flemish side there was 3% to 6% loss. So let's say 100,000 acres. This was more or less anticipated. And now I think it will be more or less the same next year. I think it will stay between 90,000 to 95,000 hectares instead of the 100,000 we normally do.

What would you say are the key points in your mandate?
I think establishing the communication within the sector is one of the key priorities. That's really a shift that I've noticed. There used to be a lot of hostility in the past between farmers and the big industry, but the industry needs the farmers and vice versa and the algorithm is perfectly placed to facilitate that. Other key issues will be the green deal, which is incredibly important, and the farm to fork strategy as well as water use. So everything that has to do with sustainability will be on my agenda. Because everything has to be sustainable right now.
But a serious problem is the retail price race to the bottom. Everybody wants the cheapest price possible, but you can't have that if you want to grow sustainably. We have to say to the public that if they want a fantastic product, produced locally by family businesses, then they have to pay for it. The race to the bottom has to stop. And we need to work on that as well.
And also there's a serious shortage of skilled people to work in the factories that are being built. We have the fantastic potatoes, but we need the people to work in the factories. And skilled people with that kind of technical profile are very hard to find, especially in the west Flanders.
So a big part of my mandate will be to keep the discussion going on some of these topics within the chain. •

"For 2022 the biggest challenge for the industry would be to survive another wave of COVID. Everything is more or less good right now, I think the industry is doing quite well."

Christophe Vermeulen, Belgapom's CEO

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.

POTATO BUSINESS Weekly Newsletter

The latest news, exclusive articles and interviews are delivered directly to your inbox with our weekly newsletter service, containing pertinent information from trusted sources, as well as industry insights and updates.

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.

E-BLAST

- Custom e-blasts using specific segments of our e-database, depending on the client's needs, with measured results.
- Special e-blast covering major worldwide trade fairs.

SPECIAL PROJECTS

- May - Potato Business Dossier 1
- November - Potato Business Dossier 2

A COMPLETE COMMUNICATION PLATFORM

Interpom 2021

TOLSMA/GRISNICH

Jan van Maldegem
Marketing & Product Manager

• **Impressions on current state of the industry**
Last year was a good year for our two brands. There were a lot of projects and investments in new in new potato lines, many from developing markets. So the market demand was again on the normal level after a slow period due to the first COVID situation. But we are always a bit surprised of how many growth possibilities there are in the potato processing world. So it looks quite positive.

• **Novelties and R&D Focus**
For this edition of Interpom we brought our new climate units that are on display. They can achieve cooling of potatoes with condensation drying - a kind of heat pump - with natural refrigerants, which is a novelty. We also display our new handling equipment for big bags and boxes with a high capacity of 100 tons of filling and emptying of potatoes in boxes, because we also see a trend among potato processors to store more and more in boxes for quality reasons. And we also show a LED lamp, which we can switch between green and white - intended specifically for potato storage facilities.

• **Looking ahead**
I think the complete chain - processors, farmers, etc. need to stay and work together. And that's the only way to stay in business. To work together, to learn from each other and to talk to each other. We need the knowledge from each other in order to grow.

TUMMERS

Dustin - Dwight Tummers
Marketing & Communication

• **Impressions on current state of the industry**
Well, the pandemic has made it really difficult to work abroad. Things like exports, things like imports, things like raw material prices. It's all gone up, but the world still needs to eat and needs food. So based on that, it's still busy. The demand hasn't dropped, but things are increasingly harder for the consumer, and for the market.

• **Novelties and R&D Focus**
At our booth we're presenting our newly developed steam peeler and we have redeveloped the drum dryer, as well as the Delta roller spreader. We're all always working on energy saving and to be more efficient with the steam usage. And that is a principle we've used in the development of the new steam peeler, but also our drum dryer.

• **Looking ahead**
For one and a half years 've been developing this drum dryer that can easily process a thousand kilograms per hour of flakes. We are focused on marketing this machine at the moment, especially because there are a lot of new developments in there. We took something and made it work better and more efficient. And we already have about 15 such machines on order already.

URSCHEL

Luc Van Buynder
Technical Sales Director

• **Impressions on current state of the industry**
We actually had a pretty good year this year, considering the situation, and we did not expect that. We actually are back to where we were in 2019, so it's not a super-great year, but it's a, I would say, a normal year for us considering what's going on. And for the next year, it looks promising too. Although the environment is quite volatile.

• **Novelties and R&D Focus**
Well, we have the latest TRS 2520 (TranSlicer® 2520 Cutter), which is the sanitary version of the 2510, which is a similar machine. It looks different. But this one is more focused on sanitation. All the surfaces are sloped so the water doesn't stay on the surface. And the same principle is applied all through the machine. The doors are all with standoffs. Everything that's mounted on the machine is raised. We also have the DC 2110, which was with us for many years now, but it comes with a new option, which is a discharge belt.

• **Looking ahead**
We try to keep the machines as safe as possible, with easy maintenance as well as easy access. That's what this machine also does. It's a very accessible machine to work on. And it's a big improvement over previous versions in terms of cutting capacity and downtime requirement.

TOMRA

Marco Colombo
Global Category Director - Potatoes

• **Impressions on current state of the industry**
We are very happy about how fast and how soon the industry has been able to bounce back to pre COVID levels. We see an accelerated expansion of the industry in emerging geographies where there has been an unprecedented growth in terms of installing local capacity, contributing to a very good momentum in recent times.

• **Novelties and R&D Focus**
We are indeed strengthening our offer and function of our equipment. We have improved our algorithm and we can guarantee a better performance, thanks to our smart ejection function with improved functionality. We also present the 'sort to defect' functionality, which is actually able to guarantee to the customer that the machine will sort guaranteeing the right amount of tolerated defects, which can vary from super premium products to products that are little bit more mainstream.

• **Looking ahead**
In comparison to the past, we now have a clear focus on core categories. Potatoes is one of them. Our vision there is offering solutions, not just machines anymore, but solutions that can contribute to the optimal manufacturing process of our customers.

Exhibitor Highlights

FAM/STUMABO

Nathalie Demeulemeester
Communication Manager

• **Impressions on current state of the industry**
Like everybody, we've struggled at some points during recent times, but on the other hand, it's a great advantage that we are in the food industry. People continue to eat, people continue to ask for processed food, so our clients keep on working. Being part of the food chain, we keep on working as well. So for us, it's been slower than other years, but there was still growth.

• **Novelties and R&D Focus**
This year we're showing the Volantis, which is a new V-belt slicer that we launched just before the first lockdown. The slicer is designed to work for both potato slices and for other vegetables, but mainly for oblong objects. And then, also, our sister company, Stumabo has the knives that work with our machines, so visitors can see them on display as well.

• **Looking ahead**
We're working hard to help our customers get the most out of the potatoes or any vegetable that they're processing, and see how we can reduce everything that's scrap. So we work in close collaboration to figure out how we can reduce whatever waste we can or use it in another way. That is also the case with the cuts. We focus precision cutting as the best way to create less waste.

RESTRAIN

Thomas van Miert
Marketing Manager

• **Impressions on current state of the industry**
I feel everybody's happy and it's a great feeling to finally see our customers face to face, because with a lot of our customers during the last two years, we couldn't be in direct contact. And now we're reconnecting with everybody, showing our novelties and the men behind the machines.

• **Novelties and R&D Focus**
First of all, we are displaying our Ethylene generator, which is our basic product, but for many of our customers it is also very important to keep the levels in their store below a certain amount of CO_2, and with this new equipment that we now provide, they can get better quality, also lower energy costs because they don't have to ventilate constantly, and also the frying color becomes better. And the really good thing about it is that it's installed in less than 10 minutes in any potato store.

• **Looking ahead**
We hope to put our first boots on the ground in the United States next year, because we feel it can be a great market for Restrain as well. It's a huge potato market where we don't have any presence yet, not even trials. So we are really looking forward to growing in that market as well.

FPS

Justin Lai
Vice President of Sales & Marketing

• **Impressions on current state of the industry**
One thing we definitely notice is the need to be local and for us being a global player, we found it worked well during the pandemic to have the global support, but also the local presence be it service, be it manufacturing. So we have been installing equipment through COVID and able to support all that equipment. We've definitely seen a lot of growth in the French fry world primarily in Asia, North America and even in Europe.

• **Novelties and R&D Focus**
We brought one of our newest products that was soft-launched two months ago, that's already in the play, which is the SIS - our spiral immersion system. And that's a very novel system using water or salt solution to heat, cool or freeze products.

• **Looking ahead**
We definitely have some new products on the horizon that have yet to really launch formally. We've got a remote monitoring system, so that we can remote service and support customers anywhere in the world, 24/7. Through this we are able to bring more data, more metrics to managers so they know what's going on at their facilities.

KEY TECHNOLOGY

Lene Boes
EMEIA MarCom Specialist

• **Impressions on current state of the industry**
We had a little less attendance than other editions but overall it was still quite good and we're seeing quite a lot of people coming to the show - not just visitors, but mostly of decision-makers from the industry. When the pandemic started there were some projects from our customers that were put on hold, but now things are starting to pick up again and we actually see our sales going extremely well. The potato industry keeps on booming despite the hurdles.

• **Novelties and R&D Focus**
We have our Verix which is our sorting equipment for the processing industry - it works with French fries for example but also vegetables can be sorted and then we have the Oculus which is our sorter for the whole potatoes and this is the first time we are showing the Oculus at Interpom, and our third piece of equipment is called Zephyr and it's a motion conveyor which is one of our newest pieces of equipment.

• **Looking ahead**
We are focusing, like much of the industry, on collecting and interpreting data. We've established our Key Discovery solution which actually interprets all the data collected by our sorters from every single French fry that passes and can communicate upstream or downstream to other equipment if there is a problem, or signal to the operator, depending on what the customer needs.

Interpom 2021

HEAT AND CONTROL

Francois Cousin
Regional Sales Manager

• **Impressions on current state of the industry**
We've been very busy meeting with existing customers so far during this edition of Interpom, but more and more there is an interest in our products directly from potato producers themselves that, instead of selling their crop to processors, they are considering processing themselves and selling the potatoes as an end product directly to consumers. Basically they are looking to add value to their product, process chips and sell them locally. So this is something new.

• **Novelties and R&D Focus**
So today we're displaying CEIA metal detectors, because Heat and Control represents CEIA in the Benelux. We have three metal detection examples - a belt, one for liquids, and another for fall-through items. And from our own portfolio we have on display a full seasoning system. It is intended for a finished product to add liquid or powder seasoning to give some flavor before to packaging it.

• **Looking ahead**
Heat and Control is very much focused on developing equipment for the big industrial players, but one direction to explore would be to diversify our offer and look at those small businesses and how we can satisfy that growing market demand.

RAYTEC

Federica Signorini
Marketing & Communication

• **Impressions on current state of the industry**
Sorting is becoming a very important process, crucial to guaranteeing the highest quality standards. And I think that in the next years we will see a huge growth in our sector because of the importance of quality and safety, also due to COVID, but also to guarantee a premium quality product to the final consumer.

• **Novelties and R&D Focus**
We are presenting two brand new machines - one is the Rainbow R 270, which is a sorting machine for very big capacities for washed and unwashed potatoes, and the other one is a Dryce belt, which is a brand new optical sorting machine with a high resolution. It is perfect for processed potatoes, like diced potatoes or washed potatoes, which are going to be frozen or cooked.

• **Looking ahead**
What is happening here at Interpom has been quite a surprise. We were impressed by the number of interested visitors. We were not so enthusiastic at the beginning because of the COVID situation, but there are many people here and they seem more focused on making business than in the previous editions.

ELEA

Stefan Toepfl
Managing Director

• **Impressions on current state of the industry**
The pandemic has influenced our market pretty heavily, mainly the French fry industry. And since the start of the pandemic, we have shifted our business mostly into potato and vegetable chips, but also into all kinds of vegetables - blanching time reduction, freezing acceleration, etc. So for the past year, the majority of our projects have been into vegetable processing in general, where smaller systems are usually installed. The French fry business has reached a pretty high market penetration of 60, 70, sometimes 80% in different world regions, of products being treated by PEF already. So the growth is mostly in other applications.

• **Novelties and R&D Focus**
We are presenting updated designs of the machines. So over the years, hygienic design has been improved and also the user friendliness of the machines. We also have larger scale equipment for the ever-growing French fries market. Now we can go up to 90 - 100 tons per hour throughput and we've also upgraded our systems for sweet potatoes.

• **Looking ahead**
There's a number of extra features like process control options. We have a cut control device here, where in a line or next to a line, people can measure the effect of PEF and quantify the effect of PEF so that you have something like a quality assurance approach.

ROSENQVISTS

Stefan Björk
Managing Director

• **Impressions on current state of the industry**
We have been very lucky during the pandemic to have a reputation that has provided us with the prospects that we need during the difficult period. So it wasn't until actually this last quarter of this year, that we saw a drop, a small drop, in the inquiry level. And it's not French fries or potato specialties. It's mostly on the snack side, potato chips, peanuts, and things like that. So we have been lucky, I have to say.

• **Novelties and R&D Focus**
This year we have the same process lines as we have had in the past, but what we have done is that we focused on our continuous development program, working with our customers to bring a series of optimizations to our lines. And this year we have a completely new concept for our dryers within the French fry process. So I think that is by far the biggest novelty for us.

• **Looking ahead**
An important thing would be to let our clients know that in spite of all the problems they may face because of the pandemic situation, we as a company, we will be there for them, no matter what.

Exhibitor Highlights

OMNIVENT

Cor van Maanen
Area Sales Manager Nederland

• **Impressions on current state of the industry**
We have good projects at the moment and last year was also a good year for us despite the COVID situation. The pandemic hasn't really influenced the demand for our solutions. The only option is to move further with COVID in our lives and find new connections. We need exhibitions for networking. We need it. That's part of our job - making connection with new clients.

• **Novelties and R&D Focus**
We are displaying different systems for potato stores. An easy design with a simple ventilation system, another better system with improved ventilation and one with added cooling and humidity control. Clients can start with an easy system and improve it over time.

• **Looking ahead**
We see a clear shift in client demand from bulk storage to boxed storage. The year before it was 80% bulk and now it's 50-50%. Bulk is easier, bulk is cheaper, but boxed is better. And there is a clear trend towards boxed storage solutions. You can control your temperature better, you can control humidity, and you can sell in batches.

ROVEMA

Jan Strijbos
Sales Manager

• **Impressions on current state of the industry**
If we look at this edition of Interpom, the number of visitors is more than I expected actually, with the recent COVID development. Some of us expected that it would be canceled completely even, so I think it's quite good, but compared to years before, it's very slow.

• **Novelties and R&D Focus**
Sustainability is everyone's focus actually. Since we do the machines, and not the packaging materials, for us sustainability means lower energy usage, and making machines that last can last for the second or third, or maybe the fifth generation after us.

• **Looking ahead**
I think Rovema is trying to think two or three steps ahead for the future. So the biggest advantage of our company right now is our focus on future generations. If one machine can make 700 million bags for you and you can make, let's say, a 5 cent margin on each bag, then one machine can make 35 million euros for you. So sometimes such a calculation is necessary.

Where Now For Spuds?

Jonathan Thomas

The global potato harvest is forecast to reach 22.7 million tons in 2021. This represents a decrease of almost 3% from 23.4 million tons the previous year. At the same time, changing consumer behaviors wrought by the pandemic are likely to persist into 2022.

by Jonathan Thomas

In addition to Covid-19, the global potato industry continues to face numerous challenges relating to the climate (with extreme weather patterns becoming more commonplace throughout much of the world), as well as difficulties relating to various political, economic and social factors.

However, the situation in China – the world's largest potato producer – appears promising for the next few years. The Chinese potato harvest currently amounts to around 99 million tons, with quality levels improving due to better field management practices and the use of more virus-free seed potatoes. Due to these developments, potato acreage and yields in China are expected to increase by 0.4% and 0.5% per annum respectively during the present decade.

Together, China and India account for a combined 38% of global potato output. Indian potato production has also increased, having grown by around 51% within the last decade. However, the situation has been less satisfactory in European producer nations such as Belgium and the Netherlands, where main potato growers have been reducing their total potato acreage. Production costs in this part of the world escalated during 2021, due to higher energy prices (e.g. for diesel and electricity) and higher prices for fertilizers and other chemicals used in potato farming.

Although there have been some issues with potato harvests, the consumer demand for processed potato-based products has continued to grow during 2021. The uncertainties resulting from the pandemic has increased in-home consumption of potato-based snacks such as crisps and chips, as well as frozen potato products. Both sectors have benefited from the increased number of meals now taking place within the home.

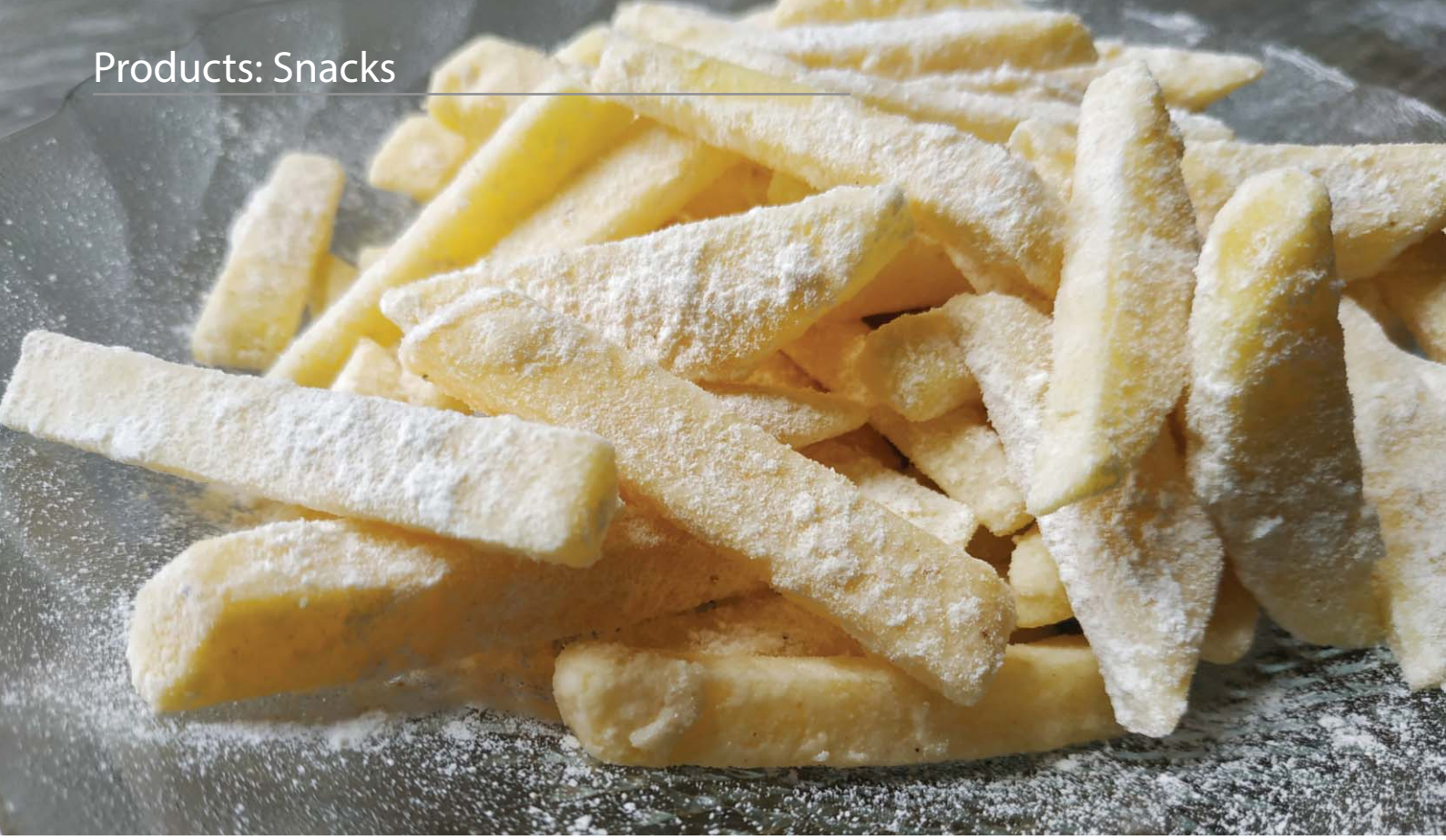
POTATO CRISPS/CHIPS

Demand for potato crisps and chips has continued to increase in 2021, a trend which appears likely to persist into next year. The market has benefited from the increasing tendency of consumers (especially

from the younger age groups) to eschew formal meals in favor of snacks. As people work from home on a more regular basis in the post-pandemic world, the trend towards irregular eating of smaller meals is expected to become more acute.
According to the latest edition of the State of Snacking study published by Mondelez International in 2020, almost two-thirds (64%) of respondents plan to continue eating several smaller meals over the course of a typical day (rather than three main meals) in the coming years. The study also revealed that more people are turning to snack foods to 'get through the day' and to help confront difficult everyday situations.
According to separate research from the Oral Health Foundation, staying at home (e.g. during lockdown periods or when working in the office was impossible) led to 38% of UK consumers increasing the number of times with which they snacked throughout the day. This trend was most evident amongst younger consumers and families – for example, 61% of those aged 35 and under admitted to eating more between meals. This was also true for 70% of households containing children aged under five. Similar eating patterns are also believed to exist in other western markets, with potato crisps and chips well suited to address these changing eating patterns.
The global market for potato chips and crisps continues to witness high levels of flavor innovation, as manufacturers aim to respond to the ongoing growth in consumer demand for new and more interesting tastes. Although flavor innovation usually represents a talking point in the industry and amongst media sources, it perhaps should be noted that the traditional favorites continue to account for the bulk of sales. In the large UK market, for example, the top five flavors – namely Ready Salted, Cheese & Onion, Salt & Vinegar, Chicken and Prawn Cocktail – have remained unchanged for a considerable period of time. In the US, plain salted potato chips are eaten regularly by more than 191 consumers, according to most recent data from Statista. This figure decreases to almost 87 million for Barbecue-flavored chips, ahead of Sour Cream & Onion (nearly 70 million) and Salt & Vinegar (more than 48 million).
PepsiCo remains one of the world's leading and most dynamic flavor innovators. In the US, its Ruffles range was extended during 2021 with a new Flamin' Hot BBQ variety, which was developed in partnership with the NBA star Jayson Tatum and inspired by cuisine from his native St Louis. The new Ruffles combined a tangy barbecue flavor with the taste of the existing Flamin' Hot chips. During the summer of 2021, other innovations from PepsiCo included a Funyuns Onion variety for its Lay's Wavy range, as well as Doritos Cool Ranch.
The same company's Walkers brand in the UK has long been associated with the development of new flavors – this has formed the basis of much of its recent promotional activity, especially via social media channels. In the summer of 2021, the Walkers range was extended with new flavors inspired by some of the UK's most popular restaurant dishes, reflecting the widespread popularity of ethnic cuisine in the country. The new flavors were Fish & Chips, Madras Curry, Thai Green Curry and Chicken Burrito.
The growing consumer desire for hotter and more intense flavors appears to show no sign of abating. In the US market, spicy flavors represent one of the fastest growth areas – according to the latest version of PepsiCo's Frito-Lay US Snack Index (which surveys almost 2,200 adults), 32% of consumers actively sought out new, spicy and bolder flavors in 2021, up from 25% the previous year. This figure increases to 45% for millennials and those belonging to the Generation Z age group. Some of the regional flavors in vogue with US consumers at present include Asian (e.g. Japanese, Thai and Korean), as well as Mexican and smoke flavorings associated with southern cooking styles.
Recent new product activity from suppliers such as Intersnack further illustrates these prevailing consumer desires and attitudes. In the UK, Intersnack's McCoy's range was extended at the end of 2020 with new Fire Pit crisps, described as being inspired by the rustic flavor of meat cooked over an open fire, to give a smoky, chargrilled flavor. Varieties in the range included Peri Peri, BBQ Rib and Smoked Chorizo. More recently, the same company's Vico range was extended in the French market in the autumn of 2021 with new intensely flavored crisps – these were launched in Roast Chicken, Barbecue and Hot Goat's Cheese & Herb varieties.
A similar launch from Kellogg was a new Loaded Nacho flavor for its Scorchin' Wavy range of Pringles crisps. This combined the taste of cheese, sour cream, jalapenos and cayenne pepper. A more novel extension to the Pringles range in the US was a Moa Burger flavor, featuring the taste of beef, ginger, garlic and chili and red peppers and inspired by the video game Halo. The flavor is based on what a burger made from the moa (an extinct bird featured in the game as a 'space ostrich') was envisaged to taste like.
Other current market trends include the continued popularity of more premium products, of which kettle chips is one leading example. Like its more regular counterpart, the kettle chips category has also witnessed growing consumer demand for bolder tastes, as well as flavors based on heritage or nostalgia for comfort foods. Manufacturers have also been making concessions towards health concerns, such as using healthier oils during the cooking process – olive oils appear to be a favoured option, as well as sunflower oil, canola oil (which is often used in fat-free products) and peanut and avocado oil – both the latter varieties are viewed as intrinsically healthy on account of their high monounsaturated fat content, while they can also enhance the flavor of the end-product.

FROZEN POTATO PRODUCTS

Global sales of frozen potato products have also benefited from much of the disruption caused by Covid-19. Many types of frozen foods – including frozen potato products – have continued to experience increased demand during periods of lockdown, with house-bound consumers



turning towards familiar favorites offering both convenience and price appeal, as well as seeking to replicate dishes usually associated with eating out. The global frozen potato products market increased in value by around 4% for these reasons in 2021, with further growth of around 6% per annum envisaged for the next few years. French fries account for over 40% of market value.

On a more negative note, however, the market continues to suffer from the partial or total shutdown of foodservice outlets, one of the main channels through which frozen potato products are still sold. Nevertheless, French fries and other potato-based products are still performing well within the booming food delivery market, given that most consumers appear to be opting for familiar meals and dishes, such as burgers, pizza and fried chicken. Furthermore, chips and French fries represent one of the most popular types of meal accompaniment for dishes sold via food delivery – according to Dataessential, 62% of UK consumers claim to be actively seeking out better quality chips and French fries ordered via takeaway/home delivery channels. Market growth in the west is also being driven by the suitability of many varieties of frozen potato products for people following vegan diets or opting for plant-based foods, the number of which continues to increase. It is worth noting that Lamb Weston's UK operation was shortlisted for the Plant-Based Product of the Year Category in late 2021 for its Dukes of Chippingdom brand. These chips, which are sold via foodservice outlets such as pubs and restaurants, are made from 100% British potatoes and available in skin-off and skin-on formats. The chips are described as super tasty, irregularly cut to give a homemade appearance and combining a crisp exterior with a fluffy interior. These have been developed to cater towards the recent growth in demand for more premium products.

Global market leader McCain has been active during 2021, consolidating its position. The company commenced production at its new Russian factory in the spring, into which it has invested €150m. Located in the Tula Oblast region, the new facility will service the growing Russian market – previously, McCain had imported frozen potato products from its other European sites. In the UK market, meanwhile, the company has addressed the growing demand for products offering new taste sensations by extending its frozen French fries range with new Flavor Maker varieties, which enable consumers to more closely replicate restaurant experiences within the home. The new fries were launched in March 2021 in Smokey BBQ, Garlic & Herb Chimichurri and Spicy Chili Chipotle Deep Ridge varieties. Another recent addition to McCain UK's range was Gastro Craft Beer Fries. In its home market of Canada, McCain has recently extended its range of breakfast offerings, possibly in response to the fact that more people are working from home and therefore less likely to eat their first meal of the day out of doors. New additions to its breakfast range included Shredded Hash browns, Savory Homefries, 9 Minute Potato Patties and Ancient Grains Potato Patties. Elsewhere, the Quick Cook brand of chips (whose products can be prepared more speedily) has been introduced in the Australian market in Straight Cut and Shoestring Cut varieties.

Consumer interest in frozen potato products offering novel flavors looks set to continue into 2022. According to research carried out in 2020 by Technomic, 73% of global consumers expressed an interest in French fries pre-seasoned with herbs or spices. In the wake of this, Lamb Weston has introduced Seasoned Cajun Style Recipe Fries in the US foodservice market. In the EU, meanwhile, Lamb Weston has recently launched Burger Fries in the Dutch retail market. Described as thin and crispy, these French fries are being positioned as the ideal accompaniment to burgers, which provides a further illustration of the current trend of consumers wanting to replicate restaurant experiences in the home. •

RESTRAIN STOPS SPROUTS

ETHYLENE GAS SYSTEM FOR POTATOES

ANTI-SPROUTING FOR POTATOES

Restrain uses natural ethylene gas which keeps your potatoes dormant and prevents sprouting. Using ethylene gas means you won't leave any residue in your crop or storage facility, allowing you to deliver potatoes which can be used immediately for processing.

- **Works in all stores**
- **No waiting time**
- **Excellent fry colours in trials**
- **Capacity MAX 5000 TONS per system**

Restrain

RESTRAIN.EU.COM

Quality Assurance in Stored Potatoes

New systems are becoming available to help the potato store managers keep records more easily and for these to be available for quality assurance and traceability purposes, whenever needed.

by Tudor Vintiloiu

Among the many aspects that need to be considered and supervised thoroughly are store temperatures and controls, which should be checked daily. According to the Potato Store Managers' Guide, issued by AHDB in UK, temperature information is the most critical and a simple log of key probe readings can be kept manually or printed off daily.
It is also useful to know how long the hardware has actually been running. Hour meters can be easily fitted to most equipment to provide this information. Stocks of potatoes should be checked weekly. Many store-control systems now offer features to log information electronically and computer-based control is also commonplace. Managers should ensure the output is in a clear, easy-to-interpret format for the operator to use and understand so errors are avoided and to make good use of user-friendly features such as touch-screen operation, graphical-user interfaces, web-based data portals and text alerts.
In addition to routine monitoring, there should also be procedures in place to assess the crop regularly and in relation to the specific requirements for the intended market. According to the guide, written by AHDB's Adrian Cunnington, within the limitations of access to the crop in store, one should try to take adequate samples to ensure they are representative of the crop. If sampling from the top of the store is required, permanent ladders and walkways should be fitted to allow this to be done in safety.

QUALITY ASSURANCE

Potato production and storage is increasingly subject to quality assurance procedures, such as Red Tractor Farm Assurance, which include traceability, care for the environment, and minimization of risk to the consumer. Good record-keeping is also a benefit to management, as it can quickly identify weak points in a production system. Recording systems should be designed so all the information on a batch of potatoes is consolidated, enabling the reasons for any problem to be more rapidly identified. All actions taken should also be recorded on the log for that batch, the guide explains.

SERVICING OF STORE EQUIPMENT

Regular servicing of store equipment reduces the risk of breakdowns, which can seriously compromise quality if they occur. It is recommended to ensure all key equipment is serviced and checked annually, according to the AHDB expert. If manufacturer servicing is not possible, one should verify temperature-recording equipment against a reliable handheld reference thermometer and keep service records safely as it is important to be able to demonstrate due diligence in the management of the store, especially if there is a need to demonstrate legal compliance or if there is a contractual problem affecting the quality of the crop.

STORE DIARY

The AHDB guide also states that it is important to keep a store diary to record general store management information related to all the stocks held within the store. This will include major events such as loading or a chemical application and regular store inspections for condensation, dehydration, rots or blemish diseases. Where detailed individual stock records are kept, it is unlikely that they and the store diary will come together, unless there is some system set up to link the two. This can be resolved by keeping a detailed record or plan showing where each stock is located in the store. Inspection information can then be linked to stocks located in the problem areas. •

2022 FEATURE PLANNING

1 JANUARY/FEBRUARY
Ad closing 17.01/Publishing 28.01

Key Exhibitors Road Map and Event Agenda

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

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

Spotlight
- Cleaning and sanitation

Markets
- Western Europe

Products
- Better for You potato products

Ingredients
- Lowering salt sontent

Storage Special
- Handling potatoes to & from storage
- Bulk vs. boxed storage

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

2 MARCH/APRIL
Ad closing 14.03/Publishing 25.03

Key Exhibitors Road Map and Event Agenda

Processes
- Sorting
- Process monitoring
- Seasoning & coating

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

Spotlight
- Smart production & Industry 4.0

Markets
- Eastern Europe

Products
- Potato-based snacks, drinks and innovations

Ingredients
- Flavors and seasonings for chips and fries

Storage Special
- Automated climate control
- Potato monitoring & quality assurance

Trade shows: Anuga FoodTec | 26-29 Apr

3 MAY/JUNE
Ad closing 09.05/Publishing 20.05

Key Exhibitors Road Map and Event Agenda

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

Expert View
- Precision in cutting equipment
- Sustainability in production

Spotlight
- Waste management

Markets
- North America

Products
- Local vs. international tastes in potato snacks

Ingredients
- Frying oils

Storage Special
- Power saving and sustainability
- Storage design and construction

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

4 JULY/AUGUST
Ad closing 18.07/Publishing 29.07

Processes
- Blanching, frying
- Forming and extruding

Expert View
- Latest frying technology developments
- PEF applications and advantages

Spotlight
- Increasing efficiency in potato processing

Markets
- South America

Products
- Potato chips flavors, textures and trends

Ingredients
- Batters, coatings

Storage Special
- Sprout suppressants in storage
- Sensors and data gathering

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

5 SEPTEMBER/OCTOBER
Ad closing 05.09/Publishing 16.09

Processes
- Cooling and freezing
- Dehydrating

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

Spotlight
- Traceability along the potato value chain

Markets
- APAC/ANZAC

Products
- Frozen French fries in retail & foodservice

Storage Special
- Refrigeration and long-term storage
- Disease Management

6 NOVEMBER/DECEMBER
Ad closing 07.11/Publishing 18.11

Processes
- Turnkey projects
- PEF technology

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

Spotlight
- Increasing production capacity/Future-proofing processing operation

Markets
- Global market predictions for 2023

Products
- Flakes, pellets and mashed potatoes

Ingredients
- The future of potato snacks 2023

Storage Special
- Storage challenges and cost-saving solutions
- Store preparation and hygiene


Like our page and join our online community:
www.facebook.com/Potatobusiness
Follow us on Twitter:
http://twitter.com/potatobusiness
We will update regularly on our activities,
upcoming features and show attendance.
Join our group on LinkedIn search for:
Potato Processing
International News
POTATOBUSINESS
on social media