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## INTERNATIONAL

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Issue 2 • Volume 34 • 2026

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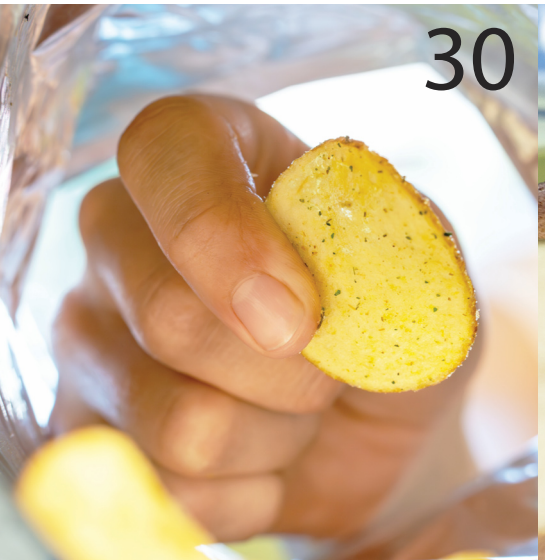
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# Interpack 2026 And The Cost Of Decisions

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

What is unfolding in the Gulf is not a distant geopolitical episode; it is an immediate cost event for agriculture—and by extension, for processing and packaging. The same structural dependencies now destabilizing fertilizer markets are the ones shaping investment decisions across the food industry. When nitrogen flows tighten and energy prices surge, the impact does not stop at the farm gate. It moves downstream, into raw material availability, production planning, and ultimately, processing margins.

*The question is no longer what technologies are available, but which investments will hold under volatility.*

For potato processors, this creates a more complex operating environment. Input volatility translates into inconsistent raw material quality, shifting solids content, and unpredictable yields. These are not abstract risks—they affect throughput, energy consumption, and line efficiency in measurable ways.

This is the context in which Interpack 2026 takes on a different role. Not as a showcase of innovation, but as a platform for decision-making under constraint.

The emphasis on Smart Manufacturing, automation, and integrated line control reflects a clear industry response: when upstream variables become less predictable, downstream systems must become more resilient. Efficiency is no longer incremental—it is structural. In practical terms, this means tighter process control, better data integration across lines, and a reduced tolerance for inefficiencies that might previously have been absorbed.

Material innovation follows the same logic. As regulatory pressure intensifies and cost structures shift, packaging is no longer a passive component but an active lever in shelf-life management, waste reduction, and compliance. In an environment where both inputs and logistics are under pressure, extending product life and maintaining integrity become directly linked to profitability.

The industry is not facing a single disruption, but a convergence of pressures—geopolitical, regulatory, and operational. Interpack sits at the intersection of these forces. ●

**Tudor Vintiloiu**
**(editor in chief)**
email: tudor.vintiloiu@trade.media

**Cristina Nae**
**(advertising sales director)**
email: cristina.nae@trade.media
Tel: +32 499 731 114
+40 725 409 997

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

**Liliana Popescu**
**(circulation manager)**
liliana.popescu@trade.media

**Raluca Canescu**
**(publisher)**
raluca.canescu@trade.media

**Nicoleta Marasescu**
**(managing director)**
nicoleta.marasescu@trade.media

**Alexandru Nastase**
**(marketing & events manager)**
alexandru.nastase@trade.media

**Alexandru Vasile**
**(art director)**
alexandru.vasile@trade.media

**Contributing writers**
Jonathan Thomas,
Euromonitor International,
Future Market Insights,
Persistence Market Research

**IT Support**
email: admin@trade.media

**Editorial office:**
**Trade Media Solutions SRL**,
Intrarea Ion Luca Caragiale 2, 2nd district, Bucharest, 020048, Romania
www.mediatrade.ro

**Printed by: Sothis**

**ISSN: 0968-7661**

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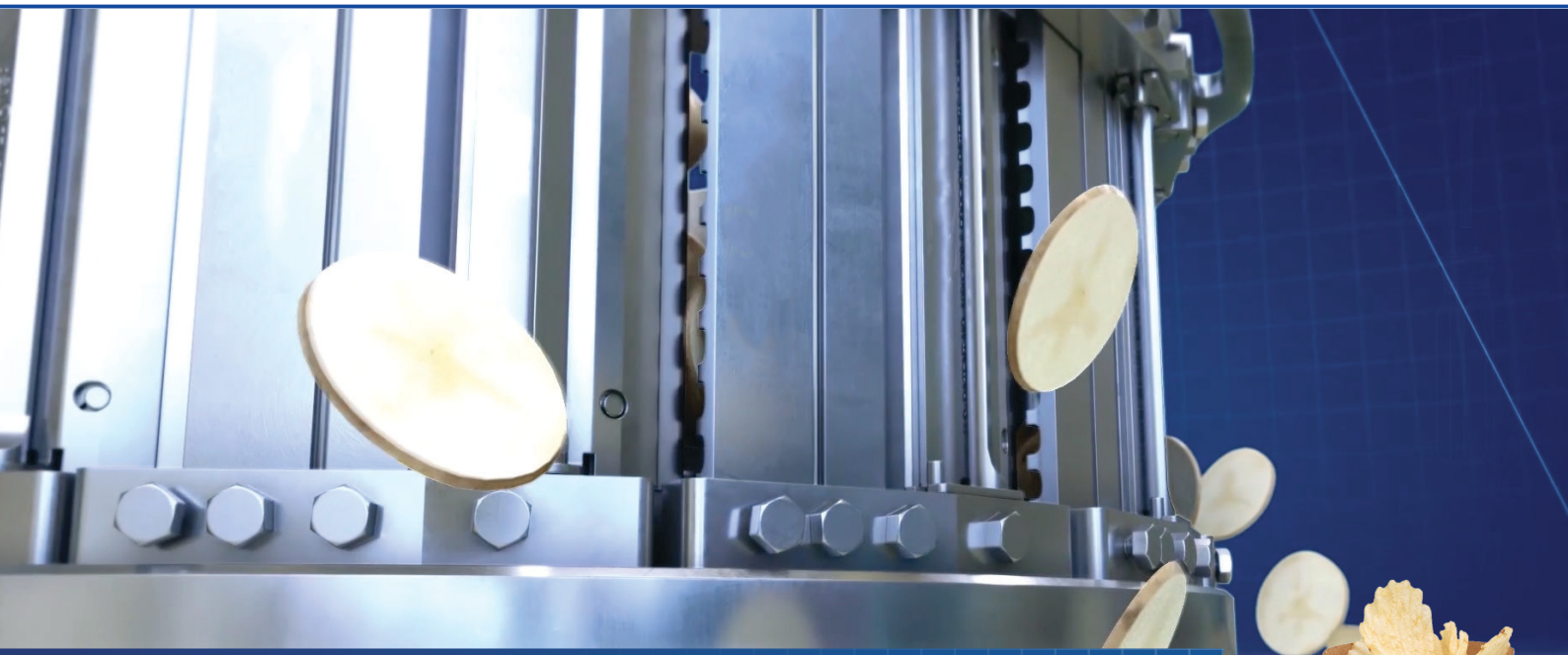

# Less Waste, Increased Profit

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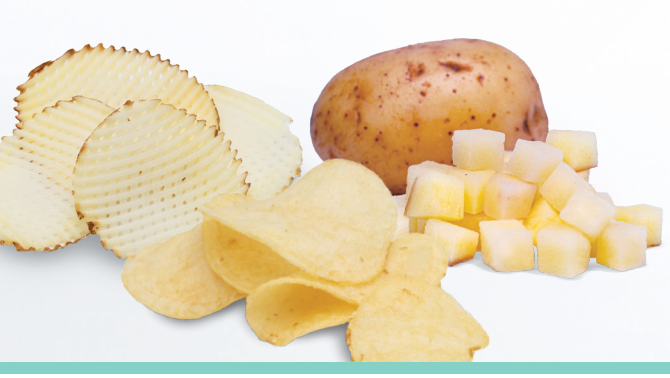

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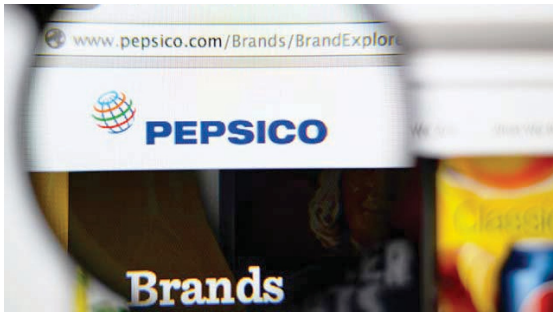
## PepsiCo Opens EUR430m Celaya Snack Plant

PepsiCo has inaugurated a new Sabritas production facility in Celaya as part of an investment exceeding €430 million (USD 467 million), according to Pro Mexico Industry. The project is included in a broader €1.85 billion (USD 2 billion) investment plan in Mexico for 2025–2028. The plant adds annual capacity of around 66,500 tonnes and operates three lines producing brands such as Sabritas, Doritos, Cheetos and Ruffles. It integrates water recirculation, rainwater harvesting, solar panels and LED lighting to improve efficiency and reduce environmental impact. PepsiCo works with over 40,000 agricultural producers in Mexico and purchases about 20% of the country's potato crop, while sourcing key inputs locally. The investment supports employment in Guanajuato, with 210 direct jobs at the site and about 800 indirect roles. The company's regional network includes




34 distribution centres and more than 1,100 routes, strengthening supply chain capacity.

## EU Wins WTO Case as Colombia Lifts Fry Duties


Colombia has removed anti-dumping duties on EU frozen fries, ending a six-year WTO dispute. The decision, formalised under Resolution 108 of 11 March 2026, affects exports worth about €19.3 million annually, according to the European Commission. The duties, introduced in 2018, targeted products from Belgium, Germany and the Netherlands. A WTO panel in 2022 ruled the measures inconsistent with trade rules, and a 2025 compliance ruling confirmed Colombia had failed to align. The case is the first to reach full compliance under the Multi-Party Interim Appeal Arbitration Arrangement (MPIA), created in 2020 to maintain dispute resolution amid the WTO Appellate Body impasse. The European Commission noted the MPIA now covers around 60% of global trade. For EU processors, the removal restores access to the Colombian market under standard conditions, ending years of restricted competitiveness linked to the tariffs.

## Lamb Weston Updates Outlook Amid Q3 Margin Pressure


Lamb Weston reported higher Q3 fiscal 2026 sales but lower profitability, according to its April 1 release. Net sales rose 3% to €1.45bn (USD 1.56bn), while net income declined 63% to €50m (USD 54m) and EPS fell to €0.36 (USD 0.39). Adjusted EBITDA decreased 27% to €252m (USD 271.7m). "We delivered another quarter in line with our expectations," said CEO Mike Smith, citing ongoing supply-demand alignment and competitive pressures. North America volumes increased, supported by customer wins and share gains, but were offset by a 7% decline in price/mix and softer international demand. Results were also affected by a €30m (USD 32.5m) write-off of excess raw potatoes and higher manufacturing costs. The company closed its Argentina plant and curtailed capacity in the Netherlands. For FY2026, Lamb Weston raised its sales outlook while reducing expected capital expenditure to about €370m (USD 400m).

## KRONEN Achieves Record EUR22m Revenue in 2025


KRONEN reported record turnover of €22 million in 2025, up 5% year-on-year, driven by international projects and its partnership with Urschel. The cooperation, launched in May 2025, combines cutting technology with full processing lines and has supported new orders from the U.S. and Mexico, alongside expansion in Asia. "Our cooperation with Urschel offers us additional market potential… and strengthens our position as a solution provider," said Managing Director Stephan Zillgith. The company, active in over 120 countries, also expanded production capacity at its German sites, including upgrades in welding, assembly and digital infrastructure. New product launches included the CAP 350 cabbage cutter and HEWA 4000 washing system, alongside research collaboration with the Leibniz Institute. Project activity spanned multiple sectors, including lettuce processing in the UK and high-capacity vegetable systems in Lebanon. KRONEN continues to invest in workforce development and training programmes.

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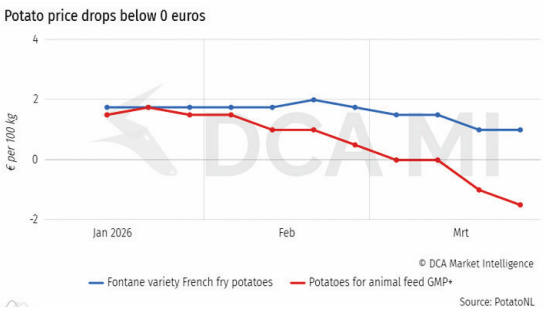
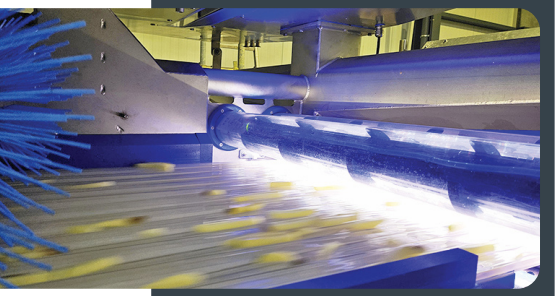
## European Potato Market Struggles with Oversupply Pressure

The European potato market is under severe pressure as oversupply drives prices in some segments below zero, according to DCA Market Intelligence. Two years of acreage expansion and strong 2025 yields have collided with weakening demand and deteriorating export conditions, including increased global competition and U.S. tariffs. Prices for feed potatoes have dropped to between €-1.00 and €-2.00 per 100 kg, with growers in some cases paying for disposal. "There is currently no outlook for market improvement," said Niels van der Boom of DCA, noting producers are releasing stocks early to avoid storage costs. Surpluses across the EU-4 are estimated at 3.3 million tonnes, including up to 600,000 tonnes unsold in the Netherlands. Volumes are being diverted to feed and biogas, while industry responses remain fragmented. The situation underscores the need for structural adjustment across production, contracting and market strategy to restore balance.




## Key Technology Launches ADR X for Potato Strip Processing



Key Technology has unveiled its ADR® X defect removal system for potato strips at Interpack, targeting improved yield and consistency. The system detects defects on wet strips and trims affected areas to recover usable product. It features enhanced multi-spectral sensing, capturing images under multiple wavelengths to improve detection of defects such as green discoloration. "Processors still need consistent results… the gap between variability in raw material and customer expectations… keeps widening," said Jack Lee, Duravant Group President. The redesigned architecture focuses on hygiene and uptime, eliminating overhead activity and integrating clean-in-place functionality. Automated adjustments allow the system to handle different cut sizes without manual tuning, while new reinforced belts reduce maintenance. ADR X can replace earlier ADR systems without major layout changes, supporting integration into existing processing lines.

## GLP-1 Uptake Raises Questions Over Potato Demand

The growing use of GLP-1 medications is introducing new demand uncertainty for the potato sector, particularly in Canada. According to CBC News, around 1.9 million Canadians are now using GLP-1 drugs, with more than half reporting reduced food intake and 27% dining out less. The shift is estimated to impact food sales by over €2.2 billion annually. For potato processors, the concern is reduced consumption intensity in discretionary categories. "People are going to the restaurant, but they're not eating as much… And french fries are often seen as extras," said Sylvain Charlebois of Dalhousie University. The trend may weigh on frozen fries and snacks, while favouring protein-rich foods. Industry groups, including the P.E.I. Potato Board, are monitoring developments and highlighting potatoes' nutritional value. With wider adoption expected, GLP-1 usage is emerging as a structural factor influencing demand and product positioning across the potato value chain.

## Heat and Control Highlights Efficiency Gains at Interpack


Heat and Control will present processing and packaging technologies at Interpack 2026 focused on seasoning accuracy and water efficiency. A key launch is the FastBack Symphony OMS, designed to improve seasoning precision at high line speeds while addressing airborne seasoning and uneven coverage. "This is the most accurate on-machine seasoning system we've ever developed," said Blake Svejkovsky. The company will also showcase Cascade Water Recirculation Systems aimed at reducing freshwater use through treatment and reuse. "Food manufacturers face growing pressure to operate with less," said Rick Bajema. Supporting modules remove starch and debris, cutting water consumption without affecting performance. Additional highlights include Tek-Dry French fry and snack dryers, built for high throughput and consistent moisture control. The portfolio targets processors facing rising costs and efficiency pressures across potato and snack production.

## MSU Develops Potato for Improved Cold Storage

Michigan State University has developed a genetically engineered chipping potato, Kal91.3, designed to maintain quality during cold storage. Derived from the Kalkaska variety, it can be stored at 40°F while limiting conversion of sucrose into glucose and fructose—key factors in fry colour and chip quality. Lower reducing sugars help prevent browning and support more consistent processing results. The work builds on research into vacuolar acid invertase, the enzyme responsible for sugar breakdown under cold conditions. "I wanted to take this gene and find out whether it could improve a potato that was having a problem with its sugars," said Dave Douches of MSU. The potato is exempt from USDA APHIS regulation, which may support future adoption. The development targets a persistent challenge in chipping: maintaining raw material consistency during storage while preserving finished product quality.

## EUROPLANT Expands Market-Driven Variety Strategy

EUROPLANT is accelerating the rollout of potato varieties across Europe, linking breeding in Germany with development in France and Spain to align output with market needs. The company said closer coordination is helping move varieties more quickly into commercial use. "The close cooperation… allows us to develop and position varieties in a highly coordinated way," said Léa Roussineau of EUROPLANT France. CORINNA is gaining traction in retail programmes, while MONIQUE is expanding in France, supported by strong post-storage washability. JELLY remains a key dual-purpose variety, valued for flexibility and resilience under drought and heat stress. VINDIKA is also advancing, with dual nematode resistance supporting field reliability and commercial uptake. EUROPLANT said its portfolio now includes over 100 varieties across fresh, processing and starch segments, reflecting a broader shift toward combining agronomic performance with retail and supply chain requirements.


# Where Processing Performance Meets Packaging Strategy

From 7 to 13 May 2026, interpack will once again position Düsseldorf as the central decision-making platform for processing and packaging investments, with around 2,800 exhibitors from 67 countries covering the full value chain. For potato processors, the relevance of the event lies less in its scale and more in its convergence of technologies directly affecting throughput, yield, compliance, and product integrity across frozen, chilled, and ambient categories.

**By Tudor Vintiloiu**

At a time when processors are navigating simultaneous pressure from energy costs, labour shortages, regulatory compliance, and raw material volatility, the event is structured around three core "Hot Topics": Smart Manufacturing, Innovative Materials, and Future Skills. These themes align closely with operational priorities in potato processing, where automation, material performance, and workforce adaptation increasingly define competitiveness.

## AUTOMATION, INTEGRATION, AND PROCESS STABILITY

Across the processing and packaging halls, the dominant narrative is not incremental improvement, but system-level optimisation. Exhibitors are positioning automation not as an isolated upgrade, but as part of integrated line architectures designed to stabilise production and reduce total cost of ownership.

Companies such as Coesia are focusing on fully integrated line solutions, highlighting automation strategies that reduce total cost of ownership while increasing efficiency across food processing applications. Similarly, MULTIVAC is emphasising "Smart Production" and "Smart Packaging" approaches that combine automation, digitalisation, and sustainability into unified systems for food processing environments.

This shift is particularly relevant for potato processors operating high-volume frying and freezing lines, where upstream variability must be absorbed without compromising downstream packaging performance. The increasing complexity of these lines makes digital integration and data transparency critical, especially in maintaining consistent product quality and minimising giveaway.

The emphasis on process optimisation is also reflected in exhibitor messaging from companies such as Theegarten-Pactec, which highlights automation and digitalisation as tools to improve efficiency at the machine level, and Marchesini Group, which links robotics and sustainability directly to regulatory compliance, particularly in the context of evolving European packaging legislation.

## SPOTLIGHT FORUM: REGULATION, EFFICIENCY, AND DATA-DRIVEN PRODUCTION

Running alongside the exhibition, the Spotlight Forum introduces a structured, content-driven programme of approximately 75 sessions under the "7 Days, 7 Topics" format. For potato processors, several of these themes directly intersect with operational decision-making.

The opening day focuses on the Packaging and Packaging Waste Regulation (PPWR), addressing practical implications for recyclability, traceability, and material selection. For processors supplying retail and foodservice markets, these discussions are critical, as packaging compliance increasingly affects product eligibility across European markets.

Subsequent sessions explore resource efficiency, digital identification, and integrated production systems. Contributions from tna highlight how integrated packaging lines can increase efficiency while meeting safety, sustainability and quality requirements, reflecting the broader industry move toward fully synchronised processing and packaging operations.

The programme also dedicates a full day to intelligent systems and AI, where exhibitors including Syntegon Technology outline how automation and data-driven production models enable end-to-end process control.

## INNOVATIVE MATERIALS: PERFORMANCE, COMPLIANCE, AND SHELF LIFE

Material innovation represents one of the most immediate areas of


impact for potato processors, especially in segments such as chilled ready meals, frozen products, and snack packaging.
With more than 1,000 exhibitors dedicated to packaging materials, interpack positions this segment as the largest of its kind globally. The focus extends beyond sustainability claims to practical performance characteristics, including barrier properties, machinability, and compatibility with high-speed packaging lines.
Companies such as Metsä Board are focusing on lightweight, recyclable cartonboard solutions aimed at reducing carbon footprint while maintaining structural integrity. At the same time, exhibitors such as Sonoco highlight how regulatory readiness and recyclability are becoming decisive factors in packaging selection, particularly as companies adapt to evolving European requirements.

## START-UP ZONE: EMERGING TECHNOLOGIES WITH SELECTIVE FOOD RELEVANCE

Complementing the established exhibitor base, the Start-up Zone introduces 22 companies from eight countries, reflecting emerging trends in sustainability, digitalisation, and process innovation. The solutions on display range from bio-based materials and reusable systems to software platforms for ESG reporting and AI-supported operations management.
Within this broader landscape, a number of developments are directly aligned with food processing applications.
Innoscentia presents sensor technology designed to improve the accuracy of best-before date management. As the company states, "conservative best before date marking confuses consumers and reduces the sales window for retailers," while real-time quality monitoring enables more precise shelf-life control and supports efforts to reduce food waste.
Nanox is developing additive-based solutions that inhibit microbial growth and regulate the exchange of quality-relevant gases within packaging systems. According to the company, these solutions are designed to extend shelf life while remaining compliant with international food-contact regulations. Material innovation is also represented by Cell2Green, which has developed a cellulose-based film made from renewable raw materials. As described in the interpack material, the film is recyclable and designed for industrial processing, offering an alternative to conventional plastic films.
In addition, Licopharm is addressing temperature-controlled transport with paper-based insulated packaging systems, reflecting ongoing developments in cold-chain logistics for sensitive products.
The Start-up Zone, supported by additional pitches in the Spotlight Forum, provides a platform for early-stage technologies that may influence future processing and packaging strategies, particularly in areas such as shelf-life management, material substitution, and resource efficiency.

## ADDRESSING FOOD WASTE AND RESOURCE EFFICIENCY

Food waste reduction remains a recurring theme throughout the event, particularly through the SAVE FOOD initiative, which includes expert talks, awards, and dedicated exhibition routes.
For potato processors, where raw material variability and processing losses are ongoing challenges, the link between packaging, shelf life, and waste reduction is increasingly direct. Technologies that improve product protection or extend shelf life are becoming part of broader efficiency strategies across the value chain.


From Equipment to Ecosystems
Beyond individual technologies, interpack 2026 positions itself as a platform for evaluating entire production ecosystems. From drive technology and robotics to industrial software and sensor systems, the supplier industry is presented as an integral part of modern processing and packaging operations.
Digital tools such as the exhibitor database, matchmaking platforms, and planning applications further support visitors in navigating the scale of the event and structuring meetings in advance.
For potato processors, the value of interpack lies in its ability to connect upstream processing challenges with downstream packaging solutions. The convergence of automation, materials, and regulatory frameworks makes the event less about isolated innovation and more about coordinated investment decisions across the production chain. •

## Ashworth Belts B.V.

**Hall 13/Booth C27/www.ashworth.com**

Ashworth, a global company, is the only conveyor belt company that manufactures and services both metal and plastic belting for straight running, turn-curve, lo-tension, PosiDrive and self-stacking spirals-offering customers the best solution for their specific requirements. Celebrating 80 years, Ashworth continues to lead with patented innovation, trusted products, reliable service, and Factory Service expertise in refurbishment, troubleshooting, installation, and maintenance.

## Heat and Control

**Hall 14/Booth A56/**

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Heat and Control is a privately-owned company with 12 manufacturing facilities, 13 test centres & over 30 offices globally. Our team has developed extensive knowledge & a wealth of experience in the engineering and manufacture of modern industrial processing, coating, seasoning & conveying. We can provide an individual solution or an entire turnkey equipment solution for ultimate efficiency & performance. Supported by a network of engineers, food technicians, after-sales service, skilled tradespeople, and support teams providing food manufacturers with confidence to achieve production goals.

## Insort

**Hall 4/Booth E44/www.insort.at**

Insort, a pioneer in food technology, revolutionises quality assurance across the food industry. Our Chemical Imaging Technology (CIT®) analyses the chemical composition of food in real time. Whether for potatoes, nuts, fruits, vegetables, pumpkin seeds, or meat, CIT® provides tailored solutions. From foreign object detection to sorting by quality characteristics like ripeness or sugar content, Insort sets new standards in food processing.

## Intralox

**Hall 13/Booth C03/www.intralox.com/**

Intralox is the global conveyance solutions leader, offering direct service for a broad range of industries in more than 100 countries. We specialize in innovative technologies, including Modular Plastic Conveyor Belting, ThermoDrive® technology, DirectDrive™ Spiral Systems and Activated Roller Belt™ (ARB™) equipment. Our products, combined with a powerful blend of engineering expertise, services and global support, are backed by the strongest written performance and delivery guarantees. Working with Intralox allows customers to experience our uncompromising commitment to providing sustainable solutions that create lasting value.

## Key Technology

**Hall 6/Booth B73/www.key.net**

Key Technology is a leading global food processing machinery manufacturer. Applying unmatched processing knowledge and application expertise, we help customers worldwide improve quality, increase yield and reduce cost. Unlike other food processing machinery suppliers or sorting machine manufacturers, we offer sorting, conveying and other processing equipment, meaning you benefit from a seamlessly integrated, customized solution from ONE source.

## Kuipers Food Processing Machinery

**Hall 3/Booth F95/www.kuipers.nu**

Kuipers, founded in 1985 in the Netherlands, specializes in designing, manufacturing and servicing processing systems for the snack and food industries. The company delivers tailored solutions for products such as potato chips, nuts, pellet snacks, and French fries, combining engineering expertise with process knowledge to ensure consistent quality and efficiency. With installations in over 60 countries, Kuipers serves both emerging producers and global brands. Sustainability is a key focus, with innovations such as water-saving systems and energy recovery technologies that reduce environmental impact while improving operational performance. Through continuous innovation and strong partnerships, Kuipers helps customers produce high-quality snacks worldwide.

## Optimum Sorting

**Hall 5/Booth D03/www.optimum-sorting.com**

Optimum Sorting specializes in developing optical sorting technology, serving both food and non-food markets worldwide. They aim to optimize sorting efficiency, enabling their customers to maximize productivity and minimize (food) waste. From the moment their journey began in 2017, they've been guided by innovation and a steadfast dedication to their customers. Their high-end sorting technology is developed and built in-house, enhanced with deep learning algorithms and AI. To advance this expertise, they collaborate with leading institutions and universities. Their teams operate worldwide, with offices in Belgium, the Netherlands, Thailand and the United States.

## tna

**Hall 14/Booth C56/D56**

**www.tnasolutions.com**

TNA, the global leader in complete food processing and packaging solutions, will showcase how its latest innovations and global industry expertise, can help snack manufacturers boost output, enhance efficiencies and stay ahead of market trends. The team on the stand will demonstrate their flagship tna robag® 3e, the world's fastest VFFS packaging system, capable of producing 250 bags /minute, and the tna intelli-flav® OMS 5.1 on-machine seasoning system, that offers both powder flavouring and liquid oil in a single drum, allowing brands to effortlessly adapt to changing consumer demands.

## Urschel Cutting Technology

**Hall 1/Booth C34/www.urschel.com**

Visit Urschel food cutting technology at Interpack where a new machine will be revealed. The new Little Gem Aspire™ Dicer is engineered for a low total cost of ownership. The dicer offers high performance in a compact design. View the Comitrol® Disc Mill 380 for homestyle to ultra smooth nut butters. See the E TranSlicer® Cutter with conveyor to easily dispense into totes and maintain at floor level. View the small footprint of the Affinity Integra® Dicer for small to intermediate dices. Leading processors around the globe rely on Urschel to deliver the future of cutting today.

## WALTERWERK KIEL

**Hall 3/Booth E73/www.walterwerk.com**

WALTERWERK KIEL is a leading manufacturer of industrial wafer baking machines for sweet wafers, Monaka wafers and savoury snacks. WALTER offers three main machine lines: JUPITER for sweet wafers, MARS for baked moulded products and the latest development METEOR for baked chips. Customers in more than 80 countries worldwide manufacture their wafer products on WALTER baking ovens. All machines are designed, built and tested in our factory in Kiel, Germany.

# How To Plan And Navigate Your Visit

interpack 2026 will take place in Düsseldorf, Germany, from **7 to 13 May 2026**, bringing together approximately **2,800 exhibitors from 67 countries** across the full spectrum of processing and packaging technologies.

## EXHIBITION STRUCTURE AND LAYOUT

The exhibition is organised across multiple halls, each dedicated to specific segments of the value chain:

- **Halls 1, 3, 4** – Processing and packaging technologies for confectionery and bakery
- **Halls 5, 6, 11–14** – Food, beverages, and industrial goods processing and packaging systems
- **Halls 7–10** – Packaging materials, packaging products, and packaging aids
- **Halls 8a, 8b** – Labelling and marking technology
- **Halls 15–17** – Pharmaceutical and cosmetics processing and packaging

Visitors focusing on potato processing applications will find the most relevant technologies in Halls **5, 6, and 11–14**, where integrated food processing and packaging systems are concentrated, as well as in **Halls 7–10** for packaging materials.

## SPECIAL ZONES AND PROGRAMME AREAS

Key areas within the exhibition include:

- **Start-up Zone (Hall 7a)**: Emerging technologies and new business models
- **Spotlight Forum (North Entrance)**: Conference programme with daily thematic focus
- **SAVE FOOD Areas**: Dedicated to food waste reduction initiatives
- **Packaging Materials Showcase**: Over 1,000 exhibitors across multiple halls.

## OPENING HOURS

The exhibition runs daily from **7 to 13 May 2026**. Standard opening hours are typically **10:00 to 18:00 (CEST)**.

## VISITOR SERVICES AND PLANNING TOOLS

interpack provides several digital tools to support visit planning and on-site navigation:

- **Exhibitor and Product Database**: Searchable platform for companies, products, and innovations
- **Fair Match**: Digital matchmaking tool for scheduling meetings
- **interpack App and MyOrganizer**: Personalised planning and navigation tools

A dedicated **hotel booking service** is also available, allowing visitors to compare accommodation options. Early booking is recommended due to high demand.

## ACCESS AND TRAVEL

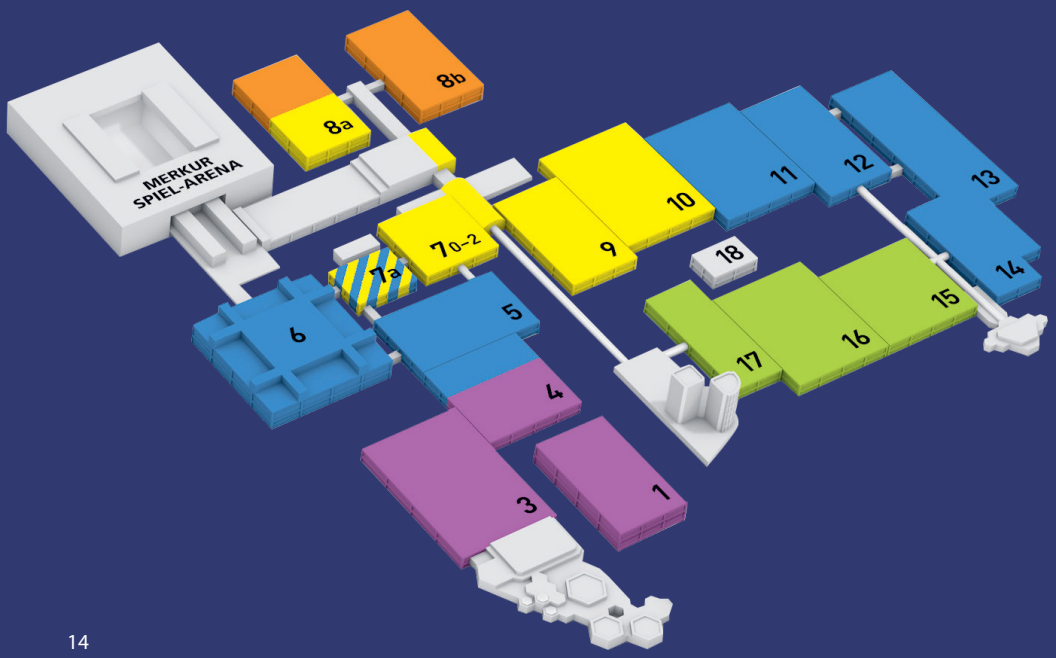
The exhibition takes place at the Messe Düsseldorf exhibition centre, which is well connected via:

- Düsseldorf International Airport
- Regional and long-distance rail connections
- Public transport links directly to the exhibition grounds.

Detailed access routes, transport options, and entry points are provided on the official interpack visitor platform.

## TICKETS

Tickets are available through the official interpack ticket shop, accessible via the event website. •




- Processing and packaging technology for food/beverages/consumer goods/industrial goods
- Processing and packaging technology for confectionery and bakery
- Processing and packaging technology for pharmaceuticals and cosmetics
- Machinery for labelling and marking technology/packaging production/ integrated packaging printing
- Packaging materials, packaging means and auxiliary packaging means
- Components

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# Cutting Technology Under Pressure: Translating Product Innovation Into Industrial Reality

Pressure to differentiate potato products no longer stops at seasoning, coating, or packaging. Processors are being asked to deliver new shapes, textures, and cut profiles that stand out in both retail and foodservice. What looks like a product development exercise quickly becomes a processing challenge once those cuts have to be produced at industrial scale, across variable raw material, and at the speeds modern lines demand.

**By Tudor Vintiloiu**

That shift is one reason cutting technology has moved much closer to the center of line design and line stability. According to Bjorn Thumas, Business Development Director, **FAM STUMABO**, "Cutting technology has evolved from being a purely mechanical step into a critical control point for both product quality and line stability."

He places that development in a wider market context: "The global potato processing market is under pressure. Recent greenfield projects and expansions have created ample production capacity, combined with excessive potato crops in Europe. Emerging export hubs, China and India, continue to grow their share in exports to the Middle East with aggressive pricing, pushing out European and North American volume. In the mids of all of this, changing tariffs between countries created extra insecurities. The current geo-political situation in the Middle East adds extra uncertainty and will increase further cost due to mounting fertilize prices, energy becoming more expensive and potential slower demand in the affected countries. This situation is placing increasing pressure on processors to deliver consistent quality at high throughput levels and to achieve optimal operational efficiency."

## CUTTING AS A CONTROL POINT IN LINE PERFORMANCE

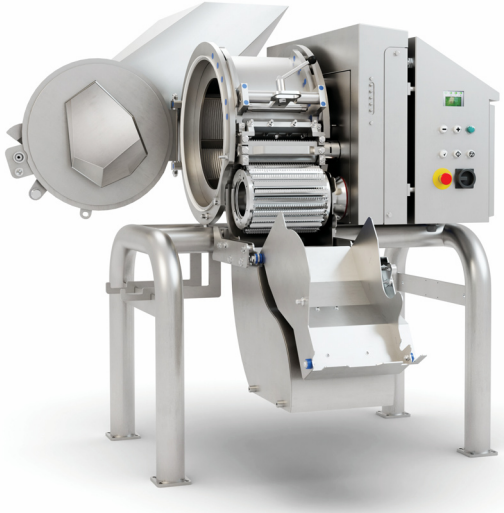
In that environment, the cutting step has consequences well beyond dimensional accuracy. As Thumas explains, "In this context, cutting is no longer only about achieving the required shape or size. It directly influences how the product behaves throughout the rest of the process. Cut accuracy affects downstream performance in blanching and frying, contributes to more uniform cooking, and plays a key role in final product consistency."

That link between cut formation and the rest of the line is where cutting technology becomes more than a machine choice. "This shift has repositioned cutting as a central element in overall line performance. Solutions that combine precise cutting principles with stable, repeatable operation help ensure consistent output and reduce process deviations from the very start of production," Thumas says.

## MANAGING RAW MATERIAL VARIABILITY AT SCALE

One of the main reasons this remains technically demanding is the raw material itself. Potatoes do not arrive at the cutter as a uniform input. "Potatoes vary significantly in size, shape, dry matter content, and internal structure depending on variety, origin, and season. These variations directly influence how the product behaves during cutting and must be managed to achieve uniform results," says Thumas.

That means cutting consistency depends on far more than blade sharpness alone. "From a technical perspective, this requires a robust cutting setup that can accommodate these variations without constant adjustment. Selecting the appropriate cutting principle is essential, but it must be supported by effective product handling. Controlled infeed,



proper alignment, and stable product guidance all play a key role in ensuring consistent interaction between the product and the cutting elements."

The tool itself remains decisive. "The design of the cutting tools is equally important. Blade geometry, edge profile, and material characteristics determine how cleanly the product is cut and how stable that performance remains over time. Maintaining sharpness and dimensional accuracy is critical to avoid deviations during continuous operation."

Setup repeatability is another factor that can easily be underestimated in high-capacity environments. "In high-capacity environments, even minor variations in tool installation or machine configuration can affect cutting results. Solutions that ensure the correct positioning of cutting components and simplify setup procedures help eliminate this source of variability," Thumas says.

## THROUGHPUT WITHOUT COMPROMISING PRODUCT INTEGRITY

As processors push capacity higher, the balance between speed and product quality becomes more delicate. Throughput cannot simply be increased by running harder. "Increasing line speed alone is not sufficient. If cutting is too aggressive or insufficiently controlled, it can lead to breakage and surface damage, affecting the uniformity of the product and the stability of subsequent processing stages," says Thumas.

FAM STUMABO frames the answer in terms of controlled interaction between product and cutting element. "Cutting technology plays a key role in addressing this challenge by controlling how the product interacts with the cutting elements. Modern cutting solutions are designed to achieve precise, controlled separation of potato tissue, reducing mechanical stress on the product while maintaining cutting accuracy at higher capacities."

He points to one specific example in potato chip applications: "Technologies such as the Scalibur™ slicer, with its dual rotation cutting principle, allow processors to maintain high throughput while reducing mechanical stress on the product, helping preserve slice integrity and improve consistency."

The same logic applies in French fry production, where yield losses can accumulate quickly over time. "In high-capacity environments, even minor deviations in cutting performance can translate into measurable material losses over time. Off-spec product, trimming losses, and reprocessing requirements all reduce the effective use of raw material and increase operational costs," Thumas says.

## BLADE ENGINEERING AND YIELD OPTIMIZATION

On that point, he cites the SureTec 240P with SureCut Unit: "In French fry processing, solutions such as the SureTec 240P equipped with the SureCut Unit (SCU) help ensure cutting accuracy from the start of each production run, reducing setup-related losses and supporting more consistent raw material utilisation."

Blade design and blade manufacturing are central to sustaining those results. "Blade design is a critical factor in achieving stable, predictable cutting performance over

time, as it directly determines the interaction between the machine and the product," says Thumas. "When blade design and production are developed in-house, as is the case at FAM STUMABO, it enables a much closer alignment between cutting tools, machine design, and specific application requirements."
He also stresses metallurgy and wear behavior as practical processing issues rather than abstract engineering points. "Achieving the right balance between hardness and ductility ensures that blades maintain sharpness over time while resisting mechanical stress, supporting stable performance across long production cycles."

## INTEGRATION WITHIN THE PROCESSING LINE

Cutting equipment is no longer treated as a standalone unit but as part of a fully interconnected processing system. Its performance must align with upstream preparation stages and downstream thermal processing, where even small deviations can propagate through the line.
Integration enables more stable operation by ensuring consistent output, while also supporting process monitoring through real-time visibility of key parameters. This allows operators to identify deviations early and maintain tighter control over overall line performance.

## EQUIPMENT CAPABILITY ACROSS APPLICATIONS

Within industrial potato processing, **Urschel Laboratories** structures its cutting solutions around specific application requirements, covering slicing, strip cutting, dicing, and particle size reduction across high-capacity production environments.
At the core of its potato chip processing offering is the CC Series, which the company describes as "the leading high yield potato slicer across the globe in use by over 90% of all commercial potato chippers." The platform supports a wide range of slicing configurations through interchangeable cutting heads, enabling processors to produce flat slices, V-cuts, crinkle slices, shreds, strips, and other profiles aligned with product specifications.
For lattice and specialty cuts, Urschel includes the CCLL slicer, designed for "corrugated cuts to create potato lattice chips or thicker potato waffle fries." The system is engineered for higher-capacity production compared to earlier models, incorporating multiple cutting stations and an enlarged cutting chamber to support increased throughput.

## FROM SLICING TO DICING AND PARTICLE REDUCTION

Beyond chip slicing, Urschel extends its cutting capability through the DiversaCut Series, which provides flexibility in producing crinkle, deep crinkle, and straight-edged dices and strips for French fries and other potato products. These systems are designed to handle a range of product sizes while maintaining consistent cut geometry under continuous operation.
For applications requiring further size reduction, Urschel deploys its Comitrol line, described as "a purpose-engineered line for potato particle reduction." The technology is used in processes such as flake production and other applications where controlled particle size is critical.
Designed for continuous operation, the system uses fixed-position reduction heads and high-speed impeller action to achieve uniform results at high throughput levels.

## NEW DEVELOPMENTS IN CUTTING TECHNOLOGY

Urschel is introducing a new cutting concept with the Little Gem Aspire Dicer, developed by its Innovation and Development team. According to the company, "The Little Gem employs patented Urschel technology to create precision cutting methods, engineered through extensive R&D."

The system is designed to produce slices, strips, and dices within a compact footprint, with configurations supporting flat slices from 2 mm up to 20 mm and a range of strip and dice dimensions. The machine incorporates a StatiCut assembly and specialized knife configurations intended to reduce cell damage and support juice retention, contributing to improved product yield and consistency.

## ALIGNING EQUIPMENT WITH PROCESSING REQUIREMENTS

Urschel places emphasis on aligning cutting equipment with the broader processing environment rather than treating it as an isolated unit. As Scott Klockow, Director of Applications and Product Development, explains: "We speak to customers to understand their processing line, their product, and their yield goals first. That way, their Urschel equipment is aligned with their operation from the start and integrates seamlessly into their production."
This approach is supported by in-house manufacturing of critical components, including knives, which contributes to operational reliability and supply continuity. Dennis Wong, Director for Urschel Asia Pacific Singapore, notes: "Because we manufacture critical parts and knives, we can control inventory levels better and we have reduced supply chain risk."
Taken together, the input from both companies points to the same broader conclusion: cutting is where product ambition collides with raw-material variability, mechanical limits, and line-speed demands. As processors continue to pursue new formats and tighter operational performance, cutting technology is being asked to do more at once: create more distinctive products, preserve product integrity, maintain repeatability, and fit cleanly into increasingly integrated production lines. •

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# On the Cutting Edge: Potato Processing Around the Globe

**With locations in over 130 countries backed by more than 700 skilled employees, Urschel continues to be a steadfast pillar supporting the worldwide community of food processors. The global leader in food processing technology has been helping to feed the world for more than 115 years as a trusted, influential partner in the food processing sector. Founded in 1910 by inventor William Urschel, the company embraces his inventive spirit as part of its culture while continuing to grow alongside the dynamic food processing industry, including the ever-evolving potato sector.**

While potatoes are enjoyed worldwide, their applications differ by region. With many variations in global potato production, the Urschel global network of service, sales, and support helps determine the optimal solution based on processors' unique production needs and regional market demands.

## A LOCAL PRESENCE WITH GLOBAL REACH

Processors rely on the strength of the Urschel global network for potato production. The Urschel network comes together as a unified team to help processors reach production goals, including cross training employees to make sure they are well-rounded in multiple aspects of Urschel machinery and tapping into Urschel team members worldwide for additional support. With such a large global presence, it's easy for local Urschel offices to fully embrace their region's food processing needs. Local offices and Urschel team members are directly immersed in the area they serve, and therefore better understand what production problems need to be solved, and how Urschel can find the optimal solution.

"Local presence matters," said Luc Van Buynder, Technical Sales Director of Urschel International (UI) Netherlands. "Being close to our customers, speaking their language, and fixing issues immediately is what makes us strong. As we grow, we stay connected, agile, and ready to deliver. We don't sell problems. We solve them."

Collaboration has been especially beneficial as processors navigate the industry-wide labor shortage – reassuring customers everywhere that Urschel is a trusted partner – locally and globally – ready to help processors meet production demands.

"When customers call Urschel, there's going to be someone on the other end who knows what they are doing and can give them answers," said Dennis Wong, Director for Urschel Asia Pacific (UAP) Singapore. "Our localization is very deep, and we have a team of experienced people who know their jobs well. Because we manufacture critical parts and knives, we can control inventory levels better and we have reduced supply chain risk. For Urschel, we manage this better as manufacturing is in-house. We keep high inventory levels at our headquarters in Chesterton, Indiana and at all local offices for quick support."

This level of expertise and guidance is easily recognizable by Urschel customers worldwide.

"Our service technicians are knowledgeable, and that's because we do a lot of service training. In Europe, for example, we cross pollinate ideas every three months," said Scott Klockow, Urschel Director of Applications and Product Development. "We make sure that any Urschel employee who is going into a customer's facility has the backing of ongoing training and a connection to people and applications so they're not going in on their own. We take a team approach with customer satisfaction as our driving force and top outcome. Our customers notice the approach that we take, and they have given us overwhelmingly positive feedback."

## HIGH-CAPACITY POTATO CUTTING MACHINES TO MEET PRODUCTION SOLUTIONS

As the number one best-selling provider of industrial food cutting machinery, Urschel is a globally recognized name in the potato processing sector with many well-known lines for potato processing.

Most notably is the CC (Chip Cutter) Series, which remains the leading high yield potato slicer across the globe in use by over 90% of all commercial potato chippers. The CCLL (Chip Cutter Large Lattice) Slicer is a popular choice for corrugated cuts to create potato lattice chips or thicker potato waffle fries. The CC Series, when paired with the SL-14 Slicing Head or SH-14 Shred Head, additionally maximize precision potato slicing and shredding.

The CC Series continues to be a popular choice, especially throughout Asia. Wong noted the CC Series is highly valued in his region for creating unique potato slice shapes such as Z chips and the Flat V type cuts.

Another Urschel line for potato processing, the DiversaCut Series, offers numerous options including crinkle, deep crinkle, and flat potato dices and strips for French fries and other potato products. For applications requiring flaking or particle size reduction, the Urschel Comitrol Series offers solutions seldomly matched in the potato processing sector.

The Urschel Comitrol Series stands out as a purpose-engineered line for potato particle reduction, addressing processing needs beyond typical industry solutions and conventional cutting methods.

Urschel offers specialized cutting and milling equipment engineered specifically for high- quality potato flake production that delivers precision, efficiency, and high output. This positions Urschel as a trusted solution for potato processors, food processors, and R&D (research and development) teams worldwide.

Urschel designs cutting and milling solutions built to maximize yield while reducing waste that meet the specific requirements of potato flake production. These cutting solutions provide processors with reliable, high-capacity equipment that supports consistent product quality for foods such as instant mashed potatoes, snack foods, baking applications, and as binders in processed foods. Urschel Comitrol machines operate

*"The future is clear - higher efficiency, effortless operation, lower maintenance, energy savings, and smarter cleaning with semi-automatic CIP (clean in place) systems."*

*Luc Van Buynder, Technical Sales Director of Urschel International (UI) Netherlands*

continuously, delivering high throughput to deter downtime. Hygienic designs ensure food safety compliance while simplifying cleanup and maintenance, allowing for uninterrupted production schedules. Patented Urschel technology is continually expanded upon to fully support and grow Urschel customer's existing capabilities. This allows new cutting methods and shapes to be implemented on machines already operating in the field, and customers benefit from new parts and newly developed knives specifically designed to meet their applications.

Van Buynder noted that this flexibility and adaptability of Urschel machinery is especially beneficial in the fast-paced potato processing market.

"Consolidation is everywhere, especially in Belgium," he said. "Geopolitics and U.S. tariffs are shaking things up. However, smart companies like Urschel aren't standing still, they're investing, innovating, and pushing for stronger returns."

Urschel is constantly embracing new opportunities to support industry growth. New to the Urschel network in 2026 includes the Little Gem Aspire Dicer. The Little Gem features a StatiCut assembly with knives designed for precision cutting action and specialty knives designed to limit cell rupturing to potentially increase the product's shelf life. Little Gem cutting techniques diminish cell damage to and facilitate juice retention to improve product yield, decrease overall operational costs, and increase profits.

Additionally, in July of 2025, Urschel added German-based KRONEN GmbH machinery to the original Urschel portfolio and began selling select cutting, washing, drying, and peeling KRONEN processing solutions in key international markets. The partnership has opened new doors while providing additional market insight, and Urschel looks forward to growing this alliance with KRONEN in the years to come.

"The future is clear - higher efficiency, effortless operation, lower maintenance, energy savings, and smarter cleaning with semi-automatic CIP (clean in place) systems," Van Buynder said. "Urschel is at the forefront turning these challenges into opportunities every single day."

## PROCESS OF POTATO PRODUCTION

Urschel potato cutting solutions are designed to optimize every stage of production, beginning with original product input and extending through final output. Whether processors are working with peeled or skin-on potatoes, Urschel equipment is engineered to maintain consistent cuts, maximize yield, and support continuous production to deter downtime.

"We speak to customers to understand their processing line, their product,

*"When customers call Urschel, there's going to be someone on the other end who knows what they are doing and can give them answers."*

*Dennis Wong, Director for Urschel Asia Pacific (UAP) Singapore*

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*Scott Klockow, Urschel Director of Applications and Product Developmen*

and their yield goals first," Klockow said. "That way, their Urschel equipment is aligned with their operation from the start and integrates seamlessly into their production."

This level of customer support ensures that processors can reduce waste, improve cut quality, and maintain consistent throughput. Urschel machines are built for rugged production environments, helping processors achieve reliable performance while minimizing inefficiencies.

Urschel supports long-term performance through in-house engineering and manufacturing of critical parts and knives, ensuring consistent, reliable performance. Designed for durability and ease of use, Urschel machinery keeps processors up and running. Precision, ruggedly engineered parts reduce changeover frequency, and extend knife life to help processors maintain efficient, uninterrupted production.

"At Urschel, we don't just keep up, we lead. We partner with our customers to create smarter solutions, better cut shapes, and cleaner processes to deliver machines that are easy to operate, reliable, and built for real people," Van Buynder said.

## BACKING PROMISES WITH PURPOSE

Positive feedback from Urschel customers is the result of over a century of dedicated service helping processors reach – and exceed – production goals. Customers see Urschel as a valued business partner they can trust to follow through on commitments, even long after the machine is installed. Urschel is diligent when giving people its word – ensuring that when they work with a customer, they take great care and work hard to fulfill their goals.

"Customers are happy with the level of support and the consistency in us delivering our service over the years. They have come to depend on us as a valued partner in their business," Wong said. "They don't only buy our products, but they also seek our opinions and recommendations on other Urschel equipment and processes. They have a lot of confidence and trust in our people. They know we have their interest at heart and don't regard business as a one-way street."

Because of Urschel's comprehensive approach to machine manufacturing paired with quality service, companies know that when they invest in an Urschel machine, they invest in the Urschel global network, and ultimately, in a key piece for their business's overall and financial success.

"Our customers don't just rely on Urschel machines, they trust us," Van Buynder said. "They know that with any question, any challenge, we'll find the best solution together. That's the Urschel difference. That's why our machines perform, our service delivers, and our customers keep winning."

Customers are welcome to test cut their products on Urschel or KRONEN machinery free of charge to determine the optimal cutting solution for their application. Visit Urschel.com for more information on how Urschel is impacting potato processing in your region. •

# Lights-Out Production: This Is As Far As Automation Goes

"Lights-out production" is one of the most compelling phrases in industrial food manufacturing because it suggests a factory capable of sustaining output with little or no direct human intervention. In potato processing, the concept has obvious appeal. A plant that can run with fewer routine manual inputs promises tighter cost control, lower labour exposure, and more consistent production. Yet the phrase often travels further than the operating reality.

**By Tudor Vintiloiu**

Potato processing is not a single machine but an interconnected system. Receiving, washing, peeling, cutting, blanching, frying, freezing, seasoning, packaging, palletizing, utilities, wastewater treatment, and storage all depend on each other. Under stable conditions, a modern line can operate with surprisingly limited intervention. The difficulty begins when one part of the process moves off target. In a tightly coupled plant, a minor deviation can spread quickly across the operation. That is why lights-out production is better understood as a test of where automation remains stable, and where it does not.

## WHAT LARGE PROCESSOR INVESTMENTS ACTUALLY PROVE

The strongest processor examples do not support the idea of fully unmanned potato factories. They support a narrower conclusion: major processors are building more automated, more efficient, and more data-intensive plants, but they are still building plants that depend on people.

Lamb Weston's Kruiningen expansion is one of the clearest examples. In 2021, the company said the new facility would be "the most automated plant" in its Lamb Weston/Meijer network and stated that it was designed to process potatoes with a minimum amount of water and energy. When the plant was officially opened in November 2024, Lamb Weston said the investment added 195 million kilos of annual production capacity. The same announcement also stated that the Kruiningen site employs approximately 650 people, including 120 new hires connected to the new plant. That combination is revealing. Even in one of the most advanced potato-processing investments publicly described by a major processor, automation has not removed the workforce. It has changed the structure of work.

Simplot's published material points in the same direction. The company says its Idaho plant in Caldwell opened in 2014 as a state-of-the-art

potato processing facility that consolidated three western U.S. plants into one site, with more than 500 people working at the campus. Simplot also says the Caldwell plant was designed to maximize energy and water-use efficiency, and separately notes that the plant can reclaim up to 1.7 million gallons of water a day for reuse in production-related functions. In Manitoba, Simplot said the 400,000-square-foot expansion of its Portage la Prairie facility more than doubled processing capacity and established the site as one of the most energy-efficient facilities of its kind. Again, the message is not labour elimination. It is higher-capital, higher-efficiency processing in which stable operation becomes more valuable and disruptions become less expensive.

Aviko's own wording supports the same interpretation. On its site, the company says it takes about an hour and a half to convert a potato into fresh, dried, or frozen products, running "24 hours a day, 7 days a week" in a "sophisticated and automated process." That is a strong description of continuous automated production. It is not evidence of an unmanned factory. It is evidence of a highly organized process environment operating continuously with structured oversight.

## AUTOMATION ADVANCES FASTEST IN STABLE ZONES

The practical lesson from these examples is that low-intervention operation becomes most plausible where process conditions are most repeatable. End-of-line packaging, pallet handling, cold-store interfaces, and parts of freezing and finished-product transport are more suited to low-touch operation because the process is standardized and the variability is lower. The further upstream a processor goes, the more difficult it becomes to remove human judgment.

Utilities and environmental systems are an important part of that picture. In Endress+Hauser's published case study on Wernsing's Addrup-Essen operation, the supplier says wastewater is monitored, cleaned, and filtered with measurement and automation technology, and that 20 percent can be reused for cleaning and processing steps. That is a useful example, but it should be read carefully: it is a supplier case study describing an important point. A potato plant cannot realistically approach low-intervention operation if water treatment, reuse, and discharge control still depend heavily on manual oversight. Utilities automation matters because it stabilizes the plant beyond the food line itself.

The same caution applies to digital integration case studies. In Crosser's

published case study on Clarebout, the supplier describes Clarebout's factories as facilities that "never switch off" and says the processor wanted to capture data such as machine health, ingredient use, and process timing and connect it to MES and ERP systems without interrupting production. That material is useful as evidence that plant-wide data visibility is becoming part of automation strategy, and it supports a narrower conclusion: processors pursuing high automation need plant-wide data orchestration, not only machine-level control.

## WHERE AUTOMATION STILL REACHES ITS LIMIT

The reason potato processing cannot honestly be described as lights-out at plant level is not that the equipment is unsophisticated. It is that the system still depends on exception handling under variable biological and operational conditions.

Potatoes are not uniform industrial inputs. Variability in size, solids, sugar content, moisture, defects, and field contamination continues to affect line behaviour. Sorting, inspection, vision systems, and control software reduce exposure to that variability, but they do not eliminate it. The same applies to hygiene and maintenance. A modern plant can automate large parts of cleaning, monitoring, and control, but food safety still depends on verification, inspection, corrective action, and disciplined execution. A highly automated line may reduce manual handling while also increasing dependence on sensors, software, and fault-free synchronization across connected subsystems.

That is why the real automation limit in potato processing is not steady-state running. It is recovery.

## THE REAL TEST IS RECOVERY

Many lines can run impressively when raw material quality is stable and all systems are synchronized. That is not the hard part. The harder question is what happens when the process is disturbed: when a raw material shift affects line balance, when a sensor drifts, when fouling interferes with control, when packaging backs up, or when an upstream slowdown begins to destabilize downstream throughput. A line that performs well only under ideal conditions is not especially close to lights-out production. A line that can detect disturbance early, isolate it, prevent cascade failure, and restore stable operation quickly is closer. This is precisely where human expertise remains central. Exception handling in a live potato plant often requires interpretation and prioritization, not just automatic correction.

That also explains why AI and analytics initiatives should be described carefully. TribalScale's published material on its work with McCain says the McCain Driving Impact project aimed to modernize manufacturing through cloud-based software, machine learning, and AI to improve efficiency and reduce waste. TribalScale also says legacy systems and paper-based workflows limited visibility and slowed decision-making across plants. Those claims are relevant to automation because they show how digital modernization can shorten response time and improve operational visibility.

## THE MORE ACCURATE FUTURE

The processor evidence supports a more precise conclusion than the usual dark-factory rhetoric. Potato processing is moving toward lower-touch production, more plant-wide automation, greater utility control, and deeper digital integration. But the credible public examples do not show that the industry has reached fully unmanned production. They show that the industry is reducing routine intervention while increasing the importance of skilled intervention when the process moves off target.

A more accurate description of the direction of travel is operator-light production with intervention-critical systems. That is where automation delivers its real value in potato processing: less routine manual involvement, better consistency, tighter control over water and energy, faster visibility into deviations, and lower recovery cost when problems occur. The dark factory remains more slogan than standard. The real progress lies in how far processors can reduce intervention without losing control. •

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# Engineered to Lead: Sorting Intelligence for the Entire Potato Line

Potato processing is defined by variability, volume, and speed. Raw material is never uniform, quality requirements continue to rise, and at the same time, pressure on efficiency and food safety is increasing. Within this environment, Insort positions itself as a complete solution provider for sorting along the entire line – from raw intake to the final processed product.

Insort delivers sorting solutions for every application and every position in the line. Whether whole washed or peeled potatoes, raw or frozen French fries, chips or specialty products – the technology operates exactly where quality decisions are made. What was once point-based inspection becomes continuous quality management across the entire process.

This approach is built on the combination of chemical and visual analysis. Chemical Imaging Technology (CIT), an advanced evolution of hyperspectral imaging, detects chemical defects in real time and reveals what remains invisible to conventional systems. This includes sugar ends or variations in dry matter content. It is complemented by high-resolution RGB systems combined with AI, also operating in real time. The result is a multidimensional evaluation of every single product – precise, consistent, and stable at industrial throughput.

A key differentiator lies in the precision of foreign material detection. Insort sets the benchmark in the market. Whether organic or inorganic critical materials, the systems reliably detect and remove what does not belong in the process. For producers, this translates into significantly higher food safety while simultaneously minimising waste and optimising yield.

This technological depth is embedded in the Sherlock machine platform. Systems such as the Sherlock Separator, Separator Fresh, and Sherlock Hybrid cover different applications and positions within the line and can be precisely tailored to product and process requirements. A central element is the flexible ejection technology: air nozzles and active or passive mechanical flaps can be used individually or in combination, enabling 2- to 4-way sorting. This allows the sorting logic to be precisely adapted to product characteristics, quality requirements, and line layout. The result is a robust, industrial-grade solution with a clear focus on operational reliability: minimal downtime, low maintenance requirements, and stable performance aligned with a true "set it and forget it" approach.

At the same time, Insort is advancing the next stage of sorting for potato products. A new belt sorter, specifically designed for French fries, is about to be launched. It focuses on precise defect detection and length sorting while ensuring high process stability. Patented technologies such as the combination of a curved conveyor belt and a special optical set-up provide the foundation for highly reliable product handling and inspection under real production conditions.

For operators, the Sherlock series delivers clear economic benefits: reduced maintenance effort, lower product loss, decreased total cost of ownership, and high overall equipment effectiveness. Combined with leading detection performance in food safety, this results in a system approach that not only meets today's requirements but is also prepared for future challenges.

Insort therefore sees sorting not as an isolated step, but as an integral part of an intelligent processing line – a line that does not just measure quality, but actively secures it. •

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# OUT OF THE BOX PACKAGING NEWS


# Time-Temperature Indicators And Intelligent Labels In Potato Product Logistics

Packaging systems that provide no feedback on product condition limit the ability of processors to verify cold-chain compliance, detect distribution failures, or identify compromised product before it reaches the market. In the potato processing industry, where frozen fries, chilled ready-to-cook products, and fresh-cut potato segments rely on tightly controlled storage conditions, packaging can function as a monitoring interface that extends process control beyond the production facility.

**By Tudor Vintiloiu**

Intelligent packaging systems incorporate indicators, sensors, or data carriers that monitor environmental or quality variables during storage and transport. Unlike conventional packaging materials that only provide barrier protection, intelligent systems can reveal whether the packaged product has been exposed to temperature abuse, oxygen ingress, or microbial activity. Research literature defines intelligent packaging as systems capable of monitoring "the condition of packaged foods or the environment surrounding the food." These systems can communicate that information through visual indicators, digital signals, or data-tracking technologies. For potato processors operating global distribution networks, the operational consequence is significant. Frozen potato products are sensitive to temperature fluctuations that can alter texture and accelerate deterioration. Chilled fresh-cut products have limited shelf life and can experience rapid microbial growth if the cold chain fails. Intelligent packaging technologies provide distributed monitoring points that reveal these failures without requiring laboratory analysis or destructive sampling.

## ENVIRONMENTAL MONITORING INSIDE THE PACKAGE

Many intelligent packaging systems function by detecting environmental variables that correlate with product quality deterioration. Sensors embedded within labels, films, or packaging structures can respond to changes in oxygen concentration, temperature history, or volatile compounds produced during microbial activity.

Gas-sensing indicators are designed to detect compounds generated during food degradation. Microbial metabolism can release volatile molecules such as ammonia or sulfur-containing gases, which react with dyes or chemical compounds in the sensor layer. The reaction produces a visible color change indicating deterioration or spoilage conditions.

Temperature exposure remains the most critical variable for potato products. Frozen fries, for example, require stable low temperatures to maintain structure and prevent recrystallization of ice within the potato matrix. If temperature rises during distribution, texture degradation and moisture migration can occur even before visible spoilage appears. Intelligent

packaging indicators that record cumulative temperature exposure can therefore reveal hidden cold-chain failures that standard expiration dates cannot detect. These systems convert packaging into a verification tool capable of identifying product quality risks before the product reaches retail shelves.

## TIME–TEMPERATURE INDICATORS AS OPERATIONAL CONTROL TOOLS

Among intelligent packaging technologies, time–temperature indicators (TTIs) have seen the most widespread commercial deployment in temperature-sensitive food supply chains. TTIs track the cumulative thermal exposure experienced by a product over time and translate it into a visual signal.

The mechanism typically relies on chemical or enzymatic reactions that progress at rates dependent on temperature. As exposure increases, the indicator undergoes a color change that reflects the total thermal history of the package. Scientific reviews describe TTIs as devices that "provide a visual indication of the cumulative temperature exposure of a product throughout its distribution chain."

The operational benefit is the ability to verify cold-chain performance instantly. A distributor receiving a shipment of frozen fries can determine whether temperature deviations occurred during transport without connecting electronic sensors or retrieving digital logs. If the indicator reveals excessive thermal exposure, the affected product can be isolated before it enters retail distribution. For large-scale potato processors producing high volumes, this capability reduces the risk of distributing compromised product and allows more precise inventory decisions based on actual product condition rather than estimated shelf life.

## TRACEABILITY SYSTEMS EMBEDDED IN PACKAGING

A second category of intelligent packaging technologies focuses on information transfer rather than environmental sensing. Radio-frequency identification (RFID) tags and other digital identifiers embedded in packaging labels can carry batch data, production details, and storage information through the supply chain.

When integrated with warehouse management systems, these identifiers allow automated tracking of individual pallets, cases, or packages. Each scanning point in the supply chain records the movement of the product and links it to production data.

In potato processing operations producing thousands of tonnes of finished product each day, traceability is a regulatory and operational requirement. Intelligent packaging identifiers reduce the time required to identify and isolate affected batches during quality incidents. Instead of recalling entire production runs, processors can narrow corrective actions to specific distribution units identified through the packaging data.

The result is lower recall costs, reduced product waste, and faster response during food safety investigations.

## COMMERCIAL SHELF-LIFE INDICATOR TECHNOLOGIES

Several intelligent packaging solutions have been commercialized to address temperature-related quality risks in perishable foods.

The shelf-life indicator developed by **Keep-it Technologies** uses a chemical reaction calibrated to mimic the temperature sensitivity of specific food products. As the reaction progresses, a colored bar within the label moves across a scale. Because the reaction accelerates when temperatures rise, the indicator reflects the actual thermal exposure experienced by the product rather than relying on a fixed expiration date.

Other commercial systems include diffusion-based time–temperature indicators such as MonitorMark® developed by **3M and Fresh-Check®** produced by **Lifelines Technologies**. These devices undergo irreversible color changes when cumulative temperature exposure exceeds predefined limits, allowing handlers to determine whether the product has remained within acceptable temperature ranges.

Such systems are typically applied as adhesive labels attached directly to individual packages or cartons, allowing quality verification at multiple stages of the distribution chain.

## VISUAL COLD-CHAIN MONITORING: THE FRESHTAG SYSTEM

Recent developments in intelligent packaging emphasize visual indicators that simplify cold-chain verification for operators without specialized equipment.

**Vitsab International AB** introduced the **Freshtag®** monitoring label to provide cumulative temperature tracking using a visual color-change indicator. The label is designed to reveal whether products have remained within predefined temperature thresholds during storage and transport.

At the center of the system is a mechanism described by the manufacturer as "Stoplight Technology." The label progresses from green to yellow and eventually red when the cumulative temperature exposure exceeds limits calibrated for specific products. This progression provides a clear visual

signal that cold-chain deviations have occurred.
The indicator is applied directly to the package and begins monitoring immediately after activation.
According to the manufacturer, the label allows operators to confirm product integrity "at a glance," without requiring scanners, digital platforms, or external sensors. The visual format also eliminates the need for interpretation across different languages or supply chain partners.
Freshtag labels are intended for integration within existing food safety systems. The manufacturer states that the technology is compliant with FDA, EU, HACCP, and ISO9001 requirements and can operate in refrigerated, frozen, or passive storage environments.
In multi-stage distribution systems such as retail distribution, catering supply chains, or last-mile delivery services, temperature deviations often occur during handling or transport. A visible monitoring label allows distributors and retailers to identify compromised products before they reach consumers.
For processors of frozen potato products, the system provides an additional verification layer that complements electronic temperature monitoring at the logistics level. Instead of relying solely on truck-level sensors or warehouse temperature logs, the product itself carries an indicator reflecting its actual exposure conditions.

## INTEGRATION CONSTRAINTS AND IMPLEMENTATION TRADE-OFFS

Despite their operational advantages, intelligent packaging technologies introduce technical and economic constraints that influence adoption decisions.
Sensor materials must remain isolated from the food product to prevent contamination or migration of reactive compounds. Indicator dyes, nanoparticles, or chemical reagents used in sensing layers therefore require careful encapsulation or placement within the packaging structure.
High-throughput packaging lines also impose strict integration requirements. Potato processing plants often package finished products at rates exceeding hundreds of units per minute. Intelligent labels or indicators must therefore be compatible with automated application systems and must not reduce packaging line speed.
Cost remains another determining factor. While intelligent packaging can reduce waste and recall risk, additional materials or components increase the cost of each package. For commodity products such as frozen fries, adoption often depends on demonstrating measurable reductions in distribution losses or quality failures.
Recycling compatibility also presents challenges. Some sensor components or electronic tags can interfere with recycling processes if they are not designed for separation from packaging materials.


## OPERATIONAL IMPLICATIONS FOR POTATO PROCESSORS

Intelligent packaging technologies convert packaging from a passive barrier into a distributed monitoring layer within the food supply chain. For potato processors distributing temperature-sensitive products across global markets, this transformation allows direct verification of cold-chain performance and product condition at the package level.
Temperature indicators reveal distribution failures before compromised products reach retail channels. Freshness sensors provide early detection of spoilage in chilled products. Traceability identifiers accelerate recall procedures and improve batch isolation.
The operational value therefore lies not in packaging innovation alone but in the visibility these technologies create across the post-processing environment. By embedding monitoring functions directly into the package, processors gain real-time insight into the conditions experienced by each product unit throughout the supply chain. •


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# Clean Label Potato Chips
# Shift From Ingredient Removal To Functional Redesign

Clean label reformulation in potato chips directly affects product stability, flavor delivery, oil performance, and shelf life. Removing artificial colors, flavors, and preservatives is no longer a marginal formulation adjustment; it alters the functional backbone of the product.

**By Tudor Vintiloiu**

For processors, the transition to cleaner labels is therefore not a marketing exercise but a technical recalibration of how chips are designed, processed, and stabilized at scale. The most visible signal of this shift came from PepsiCo, which confirmed in 2025 that its core Lay's range in the United States would move to formulations without artificial flavors or colors from artificial sources. As one of the category's largest global producers, this move establishes a new baseline. Clean label is no longer confined to niche or premium sub-

brands; it is being integrated into high-volume, cost-sensitive portfolios where performance tolerance is far lower.
At the same time, premium and challenger brands are pushing further into ingredient transparency. Companies such as Kettle Brand and Jackson's have expanded ranges built around avocado oil, non-GMO potatoes, and simplified seasoning systems, while Calbee America introduced organic chip lines under its Weston's Family Farms label. These developments reinforce that clean label positioning increasingly encompasses the entire formulation architecture—oil system, sourcing narrative, and certification—not just the removal of specific additives.

## REPLACING FUNCTIONALITY, NOT JUST INGREDIENTS

For processors, the core challenge lies in replacing functionality rather than ingredients. Artificial additives historically delivered consistent color, oxidative stability, flavor intensity, and shelf-life extension under variable processing conditions. Removing them exposes gaps that must be addressed through alternative ingredient systems and tighter process control.
Natural colorants such as paprika, turmeric, and annatto are widely used, but they introduce variability in heat stability and color consistency. Similarly, replacing synthetic antioxidants with plant-derived systems—such as rosemary extracts—requires careful balancing of dosage, sensory impact, and oil compatibility.

## INGREDIENT SYSTEMS BECOME MORE COMPLEX

This is where ingredient suppliers are repositioning their portfolios. Ingredion, for example, has focused on functional native starches designed to replicate some of the stability and textural benefits of modified starches while maintaining simpler labeling. In potato chip applications, starch functionality plays a role in coatings, seasoning adhesion, and oil interaction.

Parallel developments are taking place in natural preservation systems. Kalsec has expanded its antioxidant and color portfolios with plant-based solutions tailored for snack applications, including rosemary-derived extracts for oil stabilization and spice-based color systems. These are not direct replacements but part of a layered formulation strategy combining multiple components to achieve equivalent performance.

## REGULATORY PRESSURE RESHAPES FLAVOR SYSTEMS

Regulatory developments are accelerating reformulation. The European Commission's decision not to renew authorization for several smoke flavoring primary products directly impacts chip manufacturers relying on smoky flavor profiles.
Smoke flavors have historically contributed to both taste and aroma persistence. Their removal forces processors to rebuild flavor systems using compliant alternatives, including spice extracts, fermentation-derived flavors, and process-driven flavor development. This creates both technical and commercial pressure, particularly in maintaining consistency across large production volumes.

## PROCESS ENGINEERING GAINS STRATEGIC IMPORTANCE

As additive systems are simplified, the margin for error in production narrows. Seasoning application, oil management, and surface coverage become critical control points.
Heat and Control, for example, has developed precise seasoning systems designed to improve accuracy and reduce waste. Controlled containment and recirculation ensure that more seasoning adheres to the product rather than being lost as dust. This reduces overapplication and helps maintain flavor consistency without compensatory ingredients.

## SALT AND OIL SYSTEMS REDEFINED

Salt reduction strategies illustrate the shift from formulation to delivery. MicroSalt Inc. has developed micronized salt particles that increase surface area and accelerate dissolution, enabling the same perceived saltiness at lower usage levels. Because the ingredient remains sodium chloride, labeling remains simple.
Oil systems are also under scrutiny. Avocado oil and similar alternatives are increasingly used in premium segments, influencing both consumer perception and processing performance. These oils introduce different oxidation behaviors and cost structures, requiring careful evaluation beyond marketing positioning.

## POTATO-DERIVED INGREDIENTS ENTER THE EQUATION

There is growing interest in leveraging potato-derived components as functional ingredients. Potato fiber and protein fractions can contribute to water binding, oil uptake reduction, and structural stability.
This creates opportunities to align clean label strategies with circular economy approaches, using internal by-products as functional inputs. However, variability and processing requirements limit widespread adoption.

## CLEAN LABEL BECOMES A SYSTEM-LEVEL STRATEGY

Large processors are formalizing clean label at portfolio level. McCain Foods has implemented a Global Clean Ingredient Policy, targeting full compliance across its product range by 2030.
This signals a broader shift: clean label is no longer

an isolated product feature but a structured, long-term strategy embedded in product development and sourcing.

## FROM SIMPLIFICATION TO SYSTEM DESIGN

The industry is moving beyond ingredient removal toward maintaining performance with fewer, simpler components. This requires integrating ingredient selection, process control, and supply chain management.

For processors, the implications are clear. Clean label increases formulation complexity, may raise costs, and often requires process investment. At the same time, it offers opportunities for differentiation and premium positioning.

The competitive divide will be defined by the ability to rebuild lost functionality through combined formulation and engineering approaches. Clean label potato chips are no longer about what is taken out, but about how the system is redesigned to perform without it. •

# Tight Supply On Paper, Heavy Reality In Storage:

## North America's Potato Market In 2026

The North American potato market entered 2026 in a position that defies a simple supply narrative. Official production data point to a smaller crop across the United States and Canada, yet inventories remain elevated in key segments, export access is under renewed political pressure, and input-cost volatility tied to global geopolitics is re-emerging as a structural risk.

**By Tudor Vintiloiu**

According to the February 2026 North American Potatoes report published by USDA National Agricultural Statistics Service, combined U.S. and Canadian production for 2025 is estimated at 539 million hundredweight (cwt), down 2% from 2024. The U.S. crop is estimated at 412.860 million cwt, while Canada is placed at 125.835 million cwt. The decline is modest in percentage terms, but its underlying drivers—and its interaction with stocks, contracts, and trade—are shaping a more complex market environment than the headline suggests.

### ACREAGE-DRIVEN CONTRACTION IN THE UNITED STATES

In the United States, the defining feature of the 2025 crop is that production declined despite strong field performance. According to USDA NASS, planted area reached 902,000 acres and harvested area 896,800 acres, both below the previous year, while yields averaged 460 cwt per acre. The U.S. Department of Agriculture's Economic Research Service noted in its December outlook that the 2025 crop was smaller primarily because reduced harvested acreage outweighed yield gains, with yields reaching record levels in several states. This distinction matters for market interpretation. It signals that supply tightening is linked to grower decisions—driven by profitability, input costs, and crop rotation—rather than widespread agronomic failure.

From a pricing perspective, acreage-led contraction tends to be more persistent. It reflects structural adjustments rather than temporary weather shocks, and it suggests that a rapid rebound in planted area is unlikely unless market incentives improve materially.

## CANADA: YIELD VARIABILITY AFTER RECORD PRODUCTION YEARS

Canada's production trend is less pronounced but still relevant. According to Statistics Canada, potato production declined by 0.9% in 2025 to approximately 125.8 million cwt following several consecutive record harvests.
The February USDA NASS tables confirm that planted area increased to 395,900 acres and harvested area to 391,700 acres, while average yield declined to 321.2 cwt per acre from 331.2 cwt in 2024. Statistics Canada linked the decline in part to drought conditions in Eastern Canada, particularly in Prince Edward Island and New Brunswick.
This shift introduces a different form of risk compared to the U.S. situation. While acreage expanded, yield variability reduced output, raising questions about consistency of supply—especially for processors dependent on reliable contract volumes.

## STOCKS REMAIN A CENTRAL MARKET VARIABLE

Despite the smaller 2025 crop, storage data suggest that supply remains sufficient to weigh on parts of the market. According to USDA NASS, U.S. potato stocks held in storage on February 1, 2026 totaled 202 million cwt, down 1% from a year earlier. These holdings represented 49% of the 2025 crop. USDA also reported season-to-date disappearance at 211 million cwt, down 3%, and processor use in the eight surveyed states at 110 million cwt, down 1%.
These figures point to a market that is moving product at a slightly slower pace than the previous year. While not indicative of oversupply in absolute terms, they suggest that inventories remain high enough to limit upward price momentum, particularly in the open market.
Industry reporting indicates a similar pattern in Canada. According to market commentary circulated by grower organisations and trade sources, Canadian potato storages held roughly 66.9 million cwt as of March 1, 2026, an increase of over 7% year-on-year and the largest March inventory on record. While not an official federal statistic, the figure aligns with broader observations of strong stock positions entering late winter.
The coexistence of a smaller crop and elevated inventories reflects slower disappearance rather than excess production alone. In practical terms, it creates a market where supply is technically tighter but still operationally heavy.

## CONTRACTED VERSUS OPEN MARKET EXPOSURE

This dynamic is particularly visible in the divide between contracted and uncontracted potatoes. According to market analysis published by AgWest Farm Credit, contracted potatoes remain slightly profitable, supported by processor demand and stable agreements, while uncontracted potatoes are slightly unprofitable under current conditions.
AgWest also reported that contracted acreage for 2026 is expected to decline by at least 10%, with contract prices described as slightly down to flat. While this is lender and industry intelligence rather than official statistical data, it reflects the


commercial reality facing growers. In a market where processing dominates demand, contract terms increasingly determine profitability, while the fresh market absorbs much of the volatility.

## DEMAND REMAINS STABLE, BUT CONSUMPTION PATTERNS SHIFT

On the demand side, consumer behaviour in the United States remains relatively resilient. According to Potatoes USA, total U.S. retail potato sales reached USD 19.9 billion in 2025, with 15.3 billion pounds sold on a fresh-weight-equivalent basis. Total category volume declined by 0.5%, while fresh potato volume increased by 1%. Potatoes USA also reported that yellow, medley, petite, and purple potatoes each recorded growth of more than 6%, and that smaller pack sizes experienced the strongest gains.

The organisation noted that "fresh potato purchase trips increasing even as spending per trip declined indicates that potatoes are being purchased more often in smaller baskets." This suggests that demand is not weakening structurally, but is shifting in format and frequency, with implications for packaging, retail positioning, and margin structure.

## PROCESSING CONTINUES TO ANCHOR THE MARKET

The North American potato sector remains heavily anchored in processing. According to Agriculture and Agri-Food Canada, approximately 69% of Canadian potato production in 2024 was destined for processing, compared with 20% for fresh consumption and 11% for seed.

The same source reported that Canada exported USD 3.7 billion worth of potato products in the 2024/2025 period, including USD 511 million in fresh potatoes and USD 2.7 billion in French fries. The United States accounted for 93% of Canadian fresh potato export value and 90% of French fry exports.

This level of integration reinforces the importance of cross-border flows and contract-based production. It also means that adjustments in processing demand—whether due to retail trends, foodservice recovery, or export competition—have direct consequences for fresh market balance.

## EXPORT COMPETITION AND MARKET ACCESS

Export performance remains mixed. According to Potatoes USA, total U.S. potato export value declined by 0.8% to USD 2.3 billion between July 2024 and June 2025, while total export volume fell by 3.75% to 3.1 million metric tons fresh-weight equivalent. Fresh and frozen exports increased over the period, but declines in dehydrated and chip products offset those gains.

At the same time, access to key markets is becoming a more visible political issue. According to reporting by Capital Press, 68 bipartisan U.S. lawmakers wrote to President Donald Trump on March 11, 2026, urging him to push Japan to open its market to U.S. fresh table-stock potatoes.

In the letter, lawmakers stated that "Technical discussions have not made meaningful progress" and argued that expanded access could generate approximately USD 150 million per year in additional exports. The issue highlights the strategic importance of market diversification, particularly as competition intensifies and traditional destinations show mixed performance. Canada is also expanding its export footprint. According to the Canadian Food Inspection Agency, an agreement reached on March 12, 2026 with Mexico's SENASICA will allow shipments of Canadian potatoes for consumption or processing into the Mexican market. Canadian Agriculture Minister Heath MacDonald stated that

the agreement "will help expand market opportunities for Canada's potato sector."
While volumes will take time to develop, the agreement introduces a new competitive dimension into a market where the United States has historically held a dominant position.

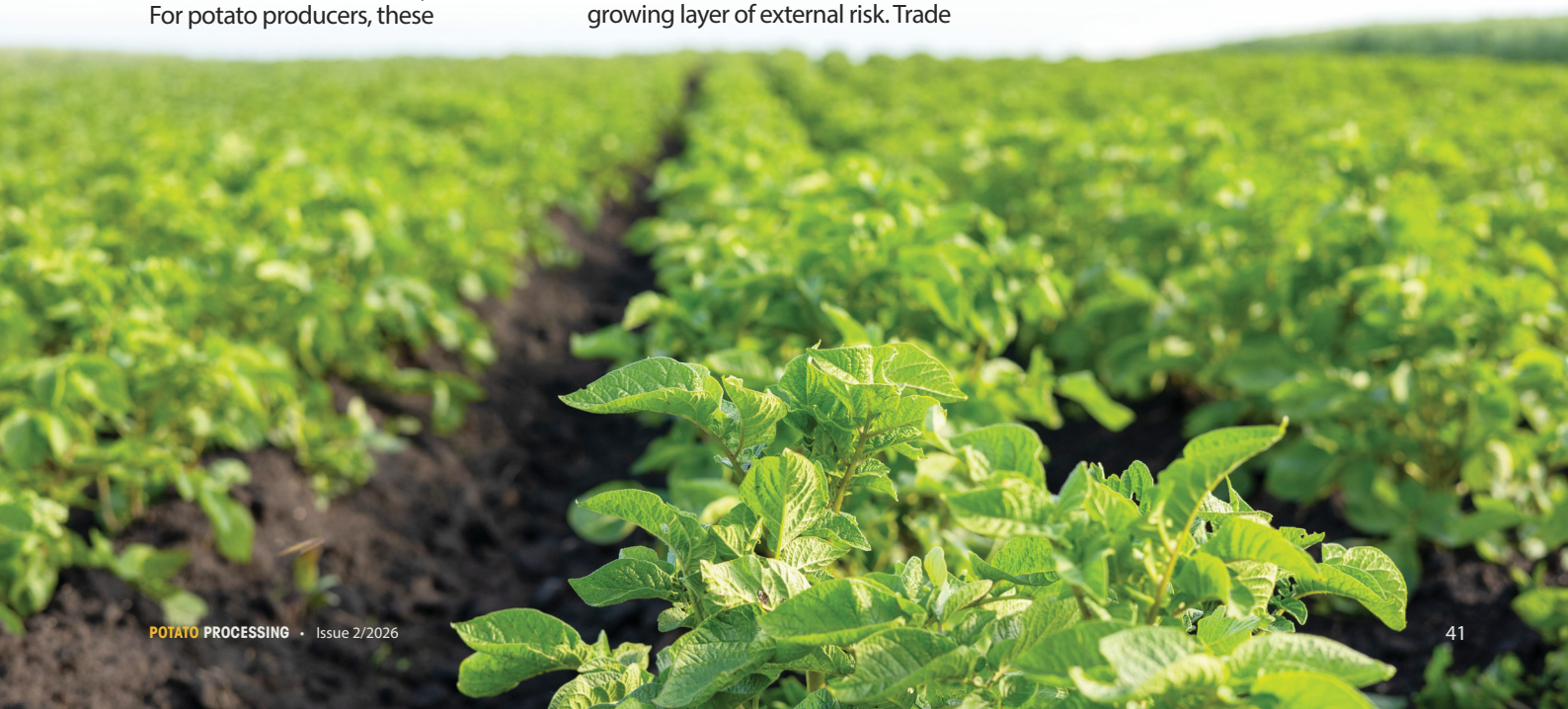
## GEOPOLITICS AND INPUT COST RISK

Beyond supply and trade, the North American potato market is increasingly exposed to global cost drivers. According to reporting by Reuters, the conflict involving Iran has disrupted fertilizer markets by affecting flows through the Strait of Hormuz, a key transit route for global energy and fertilizer shipments.
Reuters reported that Middle East urea prices have risen by more than 40% and that U.S. fertilizer prices have increased by as much as 32% since the onset of the conflict. Analysts cited in the same reporting warned that fertilizer prices could double if the situation escalates.
According to the U.S. Energy Information Administration, the Strait of Hormuz handles roughly 20% of global petroleum liquids consumption and a significant share of global liquefied natural gas flows. While the United States is less directly dependent on imports through this route—accounting for about 7% of its crude imports and 2% of total petroleum consumption—the global nature of energy markets means that price effects are transmitted internationally.
For potato producers, these

developments translate directly into higher costs for fertilizer, fuel, storage, and transportation. Even in a relatively balanced supply environment, rising input costs can compress margins and influence planting decisions.

## OUTLOOK: A MARKET DEFINED BY BALANCE AND EXPOSURE

The North American potato market in 2026 is not defined by a single dominant factor. Instead, it is shaped by the interaction of several forces: a modestly smaller crop driven by acreage decisions, inventories that remain sufficient to limit price upside, stable but evolving consumer demand, and increasing reliance on export markets.
Overlaying these fundamentals is a growing layer of external risk. Trade access negotiations, competitive positioning in key markets, and geopolitical developments affecting energy and fertilizer costs are all becoming more relevant to day-to-day market outcomes.
The result is a market that is balanced, but not secure. Supply is lower, but not tight enough to eliminate pressure on uncontracted growers. Demand is steady, but not strong enough to absorb all variability without adjustment. And costs are rising in ways that are largely outside the control of producers.
For industry participants, the challenge in the coming season will not be simply to produce more or less, but to manage exposure—across contracts, storage, exports, and input costs—in a market that is increasingly influenced by factors far beyond the field. •



# The European Market Perspective: Structural Oversupply Meets Input Cost Inflation

The European potato market is entering the 2026 season under sustained pressure, shaped by a combination of structural oversupply, weak price signals, and rising production costs. While short-term demand has improved, underlying fundamentals continue to point to a market struggling to rebalance after two consecutive years of strong production.

**By Tudor Vintiloiu**

According to DCA Market Intelligence, the EU-4 markets—Netherlands, Belgium, France, and Germany—are carrying a combined surplus of approximately 3.3 million tonnes. This reflects a period of acreage expansion and strong yields in 2025, particularly in the Netherlands, where production reached around 4.2 million tonnes, roughly 900,000 tonnes higher year-on-year. Belgium is estimated to hold around 800,000 tonnes without buyers, while France and Germany each face surpluses of close to 1 million tonnes.

Price signals reflect the severity of the imbalance. Data from PotatoNL, cited by DCA, show that potatoes for animal feed have fallen into negative pricing territory, ranging between €-1.00 and €-2.00 per 100 kilograms. Even processing-grade potatoes are trading only marginally above these levels in some segments, forcing increasing volumes into low-value outlets such as feed, anaerobic digestion, or disposal.

Storage, traditionally a stabilizing factor, is now reinforcing market pressure. With no clear prospect of price recovery and rising energy costs, growers are accelerating stock release. As DCA market specialist Niels van der Boom noted, "there is currently no outlook for market improvement," leading growers to avoid further cooling costs and bring additional volumes onto the market.

## DEMAND IMPROVES, BUT MARKET REMAINS SELECTIVE

Short-term demand has provided limited support. According to the Irish Farmers' Association, consumption increased across retail and foodservice channels in the run-up to Easter. However, the IFA cautioned that "it is very unlikely that all stocks will be cleared," while also noting that "contracts are falling behind and storage costs are rising."

Export demand is also tightening. The IFA emphasized that "only very best quality is required for export," narrowing the share of marketable product and leaving lower-grade volumes with limited outlets.

## RISING COSTS AND PLANTING UNCERTAINTY

At the same time, input cost inflation is becoming a decisive factor for the next planting cycle. Market sources cited by Expana and World Potato Markets report that rising fuel and fertilizer costs—linked in part to geopolitical tensions affecting energy markets—are influencing grower decisions. Brent crude rose sharply following the escalation involving Iran, while European natural gas prices also increased significantly, pushing up electricity costs for storage and processing.

This combination of weak prices and rising costs is creating uncertainty around planting for the 2026/27 season. While market participants broadly agree that acreage reductions are needed to correct the current imbalance, there is no guarantee this will materialize. As World Potato Markets noted, "another season of rock bottom free-buy potatoes and lower contract prices would be disastrous for growers and their businesses."

The European market is therefore entering the new season in a state of adjustment rather than recovery. Surplus volumes remain substantial, demand is selective, and cost pressures are rising. Without a meaningful correction in planted area or a shift in demand, the sector risks extending the current cycle of oversupply and price instability into the next season. •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# POTATOBUSINESS DIGITAL

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# Getting Chippy: Convenience, QSR Growth And Innovation Fuel Market Expansion

Jonathan Thomas

The global market for frozen potato products is large and diverse, encompassing sectors such as French fries, chips, wedges and potato croquettes and rostis. According to Fact MR, global sales of these products were worth over USD65bn in 2025, a figure forecast to increase to almost USD113bn by 2035, with annual growth averaging nearly 6% during the intervening years.

**By Jonathan Thomas**

One of the main drivers of this projected growth is the increased proliferation of fast food and quick service restaurant (QSR) chains throughout the world, as well as steady consumer demand for convenient and affordable meal options. The market is also witnessing the emergence of healthier products, e.g. low-fat lines and frozen potato products designed for cooking in air fryers.

By product sector, French fries and chips accounted for around 35% of global market value in 2025, ahead of potato wedges (20%). The continued market dominance of French fries and chips can largely be attributed to their versatility and convenience of usage, in both retail and foodservice applications. Sales of potato wedges are believed to be more heavily skewed towards the foodservice industry, where they represent a popular menu item in outlets such as pubs and QSRs. The foodservice industry accounts for an estimated 55% of the global market, while McCain Foods is the leading supplier, with a share of around 25%. This figure decreases to 20% for Lamb Weston, 15% for JR Simplot and 10% for Aviko.

Demand for frozen potato products is heavily influenced by consumer eating habits, specifically which types of potato dishes are preferred. A 2025 survey of 2,500 UK adults sponsored by the TV chef Jamie Oliver found that roast potatoes were cited as the preferred method of eating potatoes by 65% of respondents, ahead of mashed potatoes and chip shop chips. Some regional distinctions were apparent – for example, jacket potatoes were a particular favorite with consumers in Eastern England, while chip shop chips were preferred by residents of the West Midlands. The top 10 methods of eating potatoes according to the survey are presented in the table below:

**Top 10 Ways of Eating Potatoes in the UK**

| |
|---|
| 1. Roast potatoes |
| 2. Mashed potatoes |
| 3. Chip shop chips |
| 4. Jacket potato with toppings |
| 5. Thick-cut chips |
| 6. Baked potatoes |
| 7. Standard French fries |
| 8. New potatoes with butter |
| 9. Hash browns |
| 10. Boiled potatoes |

Source: Trade sources

Most of these types are available to purchase in frozen format, aside from boiled and new potatoes. In contrast, a poll of 2,000 UK consumers carried out by the French restaurant chain Côte Brasserie found that French fries represent the fried potato of choice, cited by 62% of respondents, having usurped chunky chips. Reasons given for choosing French fries included a crispy texture (mentioned by 58% of respondents), not being greasy (mentioned by 32%), not going soggy (mentioned by 24%) and being able to get more onto a plate (mentioned by 18%).

A liking for French fries was especially high amongst respondents in cities such as London (67%), Leicester (52%) and Birmingham (51%), and considerably lower in Cambridge and Norwich. The research found that consumers eat French fries or chips on average three times per week, with 65% claiming they would have them as part of every meal if possible. In addition, over a third (35%) said they always had a side order of fries or chips when eating out. These findings further illustrate the importance of French fries and chips to the category in markets such as the UK.

## RETAIL TRENDS

Frozen potato products such as fries, chips and wedges are widely available within the retail sector. In some instances, frozen products compete against the chilled sector, although sales are heavily skewed

towards the former in most countries. The recent introduction of new freezing technologies to enhance product quality and shelf-life, coupled with the expansion of cold chain distribution networks in regions such as the Asia-Pacific suggest that frozen products are set to retain their dominant position within the retail industry. From a supply perspective, the retail market is mostly contested between a handful of leading multinationals and own-label products.

McCain represents the leading supplier in many parts of the world, especially in large markets such as the US, the UK and Australia. In the UK, for example, it represents the country's largest purchaser of British potatoes, buying up around a fifth of the annual crop. One of its latest innovations in the UK market has been the extension of its Air Fryer range with new Hash Brown Bites and Crispy Dippers, which are promoted as suitable for meal accompaniments or in-home social occasions. At around 66%, household penetration of air fryers is high in the UK, compared with an estimated 35% in continental Europe, with around 3 million sold during 2025. Air fryers are now the third most popular kitchen appliance in the UK, trailing only toasters and microwave ovens. Latest data suggests that over 80% of air fryer owners in the UK use them at least once a day.

McCain has also been focusing upon frozen potato products suitable for air fryers in the Australian market. Recent extensions to its Air Fryers range have included Hash Browns and French fries in Straight Cut and Rustic Skin-On varieties. Air fryers are increasing in popularity in Australia for the same reason as the UK, i.e. they are convenient and offer a healthier way of cooking than deep-frying with oil. Both Australia and New Zealand are widely regarded as two of the earliest adopters of air fryers.

Manufacturers continue to experiment with new flavors, introducing chips and fries incorporating influences from ethnic cuisines such as American and Asian. In the US market, recent extensions to McCain's range have included Garlic & Herb Crinkle Fries and Spicy Straight Cut Fries. Texture is also an important driver of innovation within the retail market, as can be

illustrated by the emergence of more skin-on varieties (which also offer improved health credentials) and products such as Triple Cooked Chips. These are considered crispier than standard chips, while at the same time offering a fluffy center.
The growing overlap between the retail and foodservice sectors is also becoming apparent within the frozen potato products market. During March 2026, Morrisons announced it was to introduce a limited edition Chinese-style Salt & Pepper Chips, a similar offering to that found within the takeaway sector. The chips were supplied in frozen format and can be cooked in 25 minutes. It should be noted that both Asda and Iceland Foods also supply frozen chips in a Salt & Pepper style.
Another trend apparent within the retail sector has been the development of more sustainable forms of packaging, mostly to cater towards environmental concerns. In 2024, Lamb Weston partnered with the Saudi-based firm SABIC and Opackgroup to develop bio-renewable plastic bags for packaging frozen potato products. The bags were made from cooking oil supplied by Lamb Weston, which is then converted into feedstock to produce a thin and lightweight polyethylene film. This new packaging reduces the carbon footprint of the product by 30% and forms part of Lamb Weston's strategy of introducing more sustainable forms of packaging during the period leading up to 2030.

## FOODSERVICE TRENDS

The foodservice industry remains a major consumer of frozen potato products, which are relatively easy to store and economical to base menus around. QSRs such as McDonalds and Burger King account for a sizeable percentage of global sales, while demand is also high from full-service restaurants (FSRs) and pub chains. Aside from the QSR sector, dishes such as fish and chips remain a popular option in FSRs and pubs, especially in markets such as the UK and Ireland.
According to data from trade body Seafish, out-of-home consumption of fish and chips in Great Britain decreased by 9% in the year ending December 2025, equivalent to a drop of more than 13 million servings. Over the longer term, the number of servings fell by 61% between 2017 and 2025, for reasons such as greater competition from ethnic dishes within the UK foodservice industry. The sector has also been hit by rising prices (much of which can be attributed to the escalating cost of many ingredients) and a decline in the number of traditional fish and chip shops.
In the year ending December 2025, British consumers purchased 130.1 million servings of fish and chips out of the home. Fish and chip shops accounted for a share of 46%, ahead of pubs (25%), QSRs (11%), FSRs (8%) and workplace and education facilities (8%). During 2025, servings via pubs decreased by 13%, while the fish and chips sector experienced a fall of 22%. The popularity of fish and chips amongst British consumers remains heavily skewed towards the older age groups, as well as weekend occasions, with Fridays and Saturdays accounting for 43% of all servings.
Another growth area within the foodservice industry which has attracted the attention of frozen potato product manufacturers has been the increased tendency to eat breakfast out of home. Although the bulk of the market is taken up by products which can be eaten on the go (e.g. pastries and sandwiches), there has also been increased interest in breakfasting in foodservice outlets such as QSRs and pubs. Typically, these compete against coffee shop and bakery chains, examples of which include Greggs, Starbucks and Costa Coffee. Breakfasts in outlets such as QSRs frequently include hash browns, which are usually supplied in frozen

format and eaten alongside other cooked items such as bacon, fried eggs, sausages and baked beans. During the autumn of 2024, McDonalds' UK business launched new bite-sized Mini Hash Browns for a limited period. These were supplied in two formats, namely as single portions or as a sharebox, the latter of which contains 15 hash browns and was marketed as ideal for sharing with friends or family. Hash browns carry a strong association with McDonalds, which led discount retailer Aldi to sell its own Oakhurst Breakfast Hash Browns outside McDonalds UK outlets during the spring of 2025. The continued growth in popularity of street foods is also influencing demand for potato products within the foodservice industry. Throughout much of the developed world, street foods are now regularly consumed at a wide range of venues, with mobile vendors representing an increasingly significant channel within the market. Food halls are also assuming a more prominent role in markets such as the UK, as people are coming to view them as a more affordable alternative to traditional FSRs.

In the UK's major cities, food halls have an average annual revenue of nearly GBP6m, with the market experiencing year-on-year growth of almost 11%. As of April 2026, there were 65 new food halls in development across the UK, with activity highest in large cities such as London, Manchester and Liverpool. Throughout Europe, the number of major food halls has increased from less than 100 at the turn of the decade to around 150, with many more in the pipeline. One of the attractions of food halls in Europe is the fact that many now serve as social hubs offering various forms of entertainment, rather than existing as simple dining locations.

Major trends within the street foods market at present include the greater use of sustainable ingredients, the introduction of new flavors and the emergence of more fusion cuisine to create new tastes. Potato-based dishes have traditionally occupied a prominent position within the market, with loaded fries one leading example. Other popular street foods based on potatoes include Vada Pav (Indian fried potato dumpling sliders) and Turkish Kumpir (baked potatoes loaded with ingredients such as cheese, pickles, olives or sweetcorn). Since 2022, McCain has participated in the Streets Ahead programme, an initiative in the UK which aims to assist budding street food entrepreneurs by offering funding grants. Since its launch, the programme has attracted over 185 participants, helped to launch 45 new businesses and supplied funding worth GBP345,000. •

# Climate Control In Potato Storage: System Integration, Forecast Logic, And Operational Risk

Climate control is the point at which raw material quality is either preserved within processing specification or irreversibly degraded. Deviations in temperature, humidity, or airflow do not remain confined to the store. They translate into sugar accumulation, fry color variability, weight loss, and ultimately reduced processing yield.

**By Tudor Vintiloiu**

The operational requirement is therefore not to maintain a target climate, but to maintain consistent crop condition across thousands of tonnes over extended storage periods.
Traditional climate computers addressed this requirement by automating fans, cooling units, and dampers against fixed setpoints.
Current systems are evolving beyond that model. Suppliers are now positioning storage control as an integrated decision environment, combining sensor data, predictive logic, and system-wide coordination to determine when, how, and at what cost climate interventions should occur.

## FROM CLIMATE COMPUTERS TO INTEGRATED CONTROL PLATFORMS

One of the clearest indicators of this transition is how suppliers now define their systems. Omnivent describes its OmniCuro platform as a system that "monitors, analyses, controls and advises," while enabling remote access via mobile and desktop interfaces. The system integrates ventilation, cooling, heating, and air distribution within a single control architecture.
With OmniCuro NEXT, the company moves further toward decision-based operation. According to Omnivent, the system allows users to "setup your storage strategy in minutes," after which it "automatically takes the product to the next storage phase." The implication is a shift in operator role: from continuously adjusting technical parameters to defining storage intent and supervising execution.

This repositioning reflects a broader industry trend. Climate control is no longer presented as a collection of automated components, but as a coordinated system designed to manage crop condition through different storage phases with minimal manual intervention.

## PREDICTIVE CONTROL AND WEATHER-DRIVEN DECISION LOGIC

Tolsma-Grisnich's Vision Control platform illustrates how predictive capability is being embedded into storage automation. The company describes the system as an "intelligent storage computer" that regulates temperature, relative humidity, and $CO_2$ by controlling fans, hatches, heaters, and refrigeration systems.
The addition of the Weather in Control module extends this capability into forward planning. Tolsma-Grisnich states that the system uses a 10-day weather forecast and incorporates variables such as target storage temperature, energy tariff structure, and the presence of mechanical cooling to determine when ventilation or refrigeration should be activated.
This approach changes the timing of intervention. Instead of reacting to current conditions, the system evaluates future conditions and selects the most efficient operating window.
In practice, this allows storage operators to use ambient air more effectively for cooling or drying when external conditions are favorable, while avoiding unnecessary mechanical cooling.
For large storage facilities, this represents a shift from control to

optimization. The system is not simply maintaining climate conditions; it is selecting the most cost-effective and product-safe method of doing so.

## MULTI-CELL COORDINATION AND CENTRALIZED CONTROL

As storage facilities increase in size and complexity, the ability to manage multiple storage zones within a single system becomes critical. Mooij Agro addresses this through its Croptimiz-r platform, which the company describes as a controller capable of managing ventilation, heating, cooling, and humidification across multiple storage rooms.

The Croptimiz-r MAX system is presented as an "all-in-one control system" with centralized management of up to 16 storage cells. Complementary modules such as the Smart Cooling Manager enable coordination between cooling units and storage areas, ensuring that refrigeration is managed as part of the overall system rather than as isolated components. This level of integration reduces the risk of conflicting actions, such as simultaneous heating and cooling or uneven airflow distribution between storage zones. It also enables consistent control strategies to be applied across the entire facility, rather than relying on individual adjustments at unit level.

## REMOTE ACCESS, DATA VISIBILITY, AND TRACEABILITY

Modern storage platforms also extend beyond real-time control into data management. Agri-Stor's Agri-Star system is described as internet-enabled and accessible via mobile devices, allowing operators to monitor and adjust storage conditions remotely. The system includes graphing and reporting functions that provide historical visibility of storage conditions. This capability is increasingly relevant in a processing context, where storage is not only an operational step but also part of a documented quality chain.

The ability to track temperature, humidity, and $CO_2$ profiles over time supports root-cause analysis when quality issues arise. It also enables comparison between storage seasons and refinement of storage strategies based on measured outcomes rather than assumption.

## $CO_2$ MANAGEMENT AS A TARGETED CONTROL LAYER

While full-platform systems are expanding in scope, specialized technologies continue to address specific storage challenges. $CO_2$ management is one of the most prominent. AHDB notes that modern storage systems increasingly use $CO_2$ sensors to measure store atmosphere and automatically trigger ventilation when required. This approach allows operators to manage respiration-related gas accumulation more precisely, reducing reliance on continuous ventilation.

Specialist providers such as Restrain focus specifically on this aspect. Their

systems are designed to control $CO_2$ levels by activating extraction only when thresholds are exceeded, minimizing unnecessary air exchange and associated energy loss. Within integrated storage systems, such modules function as targeted control layers rather than standalone solutions.

## FAILURE MODE: SENSOR DRIFT AND MEASUREMENT ERROR

As automation becomes more central to storage operation, the reliability of measurement systems becomes critical. Vaisala emphasizes that humidity measurement in industrial environments requires regular calibration and highlights the interdependence of temperature and relative humidity. The company states that "a difference of only 1°C between the temperature of the measurement point and the temperature of the sensor can cause an error of 3% RH at 20°C and 50% RH, and 6% RH at saturation." In high-humidity storage environments, such deviations can directly affect control decisions.
Vaisala also notes that condensation and contamination can affect sensor accuracy and longevity, particularly in environments where high humidity is maintained over extended periods. In potato storage, where humidity control is essential to limit weight loss and maintain tuber quality, such measurement errors can result in inappropriate ventilation or cooling actions.

## NON-REPRESENTATIVE SENSOR PLACEMENT

Accurate measurement depends not only on calibration but also on placement. Sensors must reflect the actual condition of the stored crop rather than localized air conditions. AHDB highlights the increasing use of $CO_2$ sensors as indicators of crop respiration and storage stability. However, the effectiveness of such systems depends on representative measurement within the storage environment. Poor placement can lead to incorrect conclusions about crop condition and trigger inappropriate control responses.
In large bulk stores, where temperature and gas distribution can vary within the pile, ensuring representative measurement remains a technical challenge. Automation systems rely entirely on these inputs; if the data does not reflect reality, the resulting control actions will not address the underlying condition.

## OVERAUTOMATION IN SUBOPTIMAL STORAGE DESIGN

Automation cannot compensate for structural deficiencies in storage design. AHDB guidance emphasizes that effective climate control depends on well-sealed and insulated buildings, with controlled airflow and minimal leakage. If insulation is inadequate or airflow distribution is uneven, the system may continuously attempt to correct conditions that cannot be stabilized. This leads to increased energy consumption and reduced control effectiveness.
Tolsma-Grisnich has stated that control systems can only perform optimally when the physical storage environment is correctly designed, with uniform air distribution and adequate insulation. In practice, this means that investment in automation must be aligned with investment in building performance.

## MAINTAINING HUMAN OVERSIGHT IN AUTOMATED SYSTEMS

Despite increasing automation, suppliers consistently emphasize the continued role of the operator. Omnivent's NEXT platform simplifies monitoring through visual indicators and alerts, but still relies on operator validation of crop condition. This reflects the limitations of automated systems in biological environments. While automation can process data and execute control logic, it cannot fully interpret crop condition, handling damage, or disease progression without human input. Effective storage management therefore combines automated control with informed oversight. The system provides data and recommendations; the operator provides context and judgment.

## REDEFINING VALUE IN STORAGE AUTOMATION

The evolution of automated climate control is shifting the basis of value from hardware capability to decision quality. Modern systems are designed to:

- Optimize energy use through predictive and coordinated control
- Maintain consistent environmental conditions across large volumes
- Provide visibility and traceability of storage performance
- Support operators with actionable data.

At the same time, they must manage the risks associated with incorrect data, system configuration, and physical limitations. For processors, the commercial impact is clear. Storage is no longer a passive stage between harvest and processing. It is an active, controlled process that directly influences product quality, operational efficiency, and profitability.

## CONCLUSION

Automated climate control in potato storage is transitioning from isolated climate computers to integrated digital platforms that combine control, monitoring, and decision support. Suppliers such as Omnivent, Tolsma-Grisnich, Mooij Agro, and Agri-Stor are driving this shift by embedding predictive logic, centralized control, and data visibility into their systems.
However, the effectiveness of these platforms depends on the reliability of measurement systems, the quality of storage design, and the continued involvement of skilled operators. Automation enhances decision-making, but it does not replace it. The direction of development is toward systems that can manage complexity, reduce variability, and improve consistency. In a processing environment where raw material quality defines downstream performance, that capability is no longer optional. •

# 2026 FEATURE PLANNING

## 1 JANUARY/FEBRUARY
**Ad closing 14.01/Publishing 28.01**

FRUIT LOGISTICA SPECIAL EDITION

**Key Exhibitors Road Map and Event Agenda**

**Processes**
- Sorting and Grading, Pre-cleaning, Washing, De-stoning
- Energy and Water Saving

**Expert View**
- Cutting/Slicing/Dicing
- PEF Applications and Advantages

**Spotlight**
- Raw Product Handling

**Markets**
- Eastern Europe

**Products**
- Freshly Packed Potatoes: Delivering Quality from Field to Shelf

**Ingredients**
- Salt

**Storage Special**
- Potato Monitoring & Quality Assurance
- Sprout Suppressants in Storage

**Trade shows:** Fruit Logistica, 04-06 February 2026

## 2 MARCH/APRIL
**Ad closing 09.04/Publishing 23.04**

FRUIT LOGISTICA SPECIAL EDITION

**Key Exhibitors Road Map and Event Agenda**

**Processes**
- Cutting Accuracy and Equipment Reliability
- Process Monitoring

**Expert View**
- Automation - Ensuring a Reliable and Flexible Production Flow
- Optical Sorting - Increasing Yelds, Reducing Waste

**Spotlight**
- Smart Production/IoT/Industry 4.0

**Markets**
- North America

**Products**
- Specialty Potato Products: Catering to Gourmet and Niche Markets

**Ingredients**
- Better for you/Clean Label

**Storage Special**
- Automated Climate Control
- Sensors and Data Gathering

**Trade shows:** Interpack, 07-13 May 2026

## 3 MAY/JUNE
**Ad closing 20.05/Publishing 03.06**

SNACKEX SPECIAL EDITION

**Key Exhibitors Road Map and Event Agenda**

**Processes**
- Efficient Freezing Technology
- Starch and By-products Processing

**Expert View**
- Complete Lines for Processing, Cutting and Hydrocutting
- Batch vs. Continuous Frying

**Spotlight**
- Food Safety

**Markets**
- APAC/ANZAC

**Products**
- Chips and Crisps: Meeting Consumer Cravings with New Flavors & Formats

**Ingredients**
- Frying Oils

**Storage Special**
- Power Saving and Sustainability
- Disease Management

**Trade shows:** Snackex, 17-18 June 2026

## 4 JULY/AUGUST
**Ad closing 12.08/Publishing 26.08**

POTATO EUROPE SPECIAL EDITION

**Key Exhibitors Road Map and Event Agenda**

**Processes**
- Conveying Systems and Belts
- Seasoning & Coating

**Expert View**
- Drying Technology Advancements
- Remote Maintenance and Customer Service

**Spotlight**
- Supply Chain Management & Logistics

**Markets**
- South America

**Products**
- Potato Flakes: The Unsung Hero of Convenience Foods

**Ingredients**
- Seasonings for Chips and Fries

**Storage Special**
- Storage Challenges and Cost-saving Solutions
- Handling Potatoes to & from Storage

**Trade shows:** PotatoEurope, 09-10 September 2026

## 5 SEPTEMBER/OCTOBER
**Ad closing 16.10/Publishing 23.10**

INTERPOM SPECIAL EDITION

**Key Exhibitors Road Map and Event Agenda**

**Processes**
- Blanching, Frying
- PEF Systems

**Expert View**
- IQF Freezing for French Fries
- Pulsed Electric Field (PEF) Processing

**Spotlight**
- The Road to Sustainability

**Markets**
- Western Europe

**Products**
- Frozen French Fries: The Everlasting Favorite in Foodservice & Retail

**Ingredients**
- Batters/Coatings

**Storage Special**
- Storage Design and Construction
- Potato Monitoring & Quality Assurance

**Trade shows:** Interpom, 29 November – 01 December 2026

## 6 NOVEMBER/DECEMBER
**Ad closing 11.11/Publishing 25.11**

**Processes**
- Oil Filtration Systems & De-fattening
- Turnkey Projects
- Waste Management/Upscaling

**Expert View**
- Sustainability in Production
- Conveying And Product Transport

**Spotlight**
- Increasing Production Capacity
- Future-proofing Processing Operation

**Markets**
- Global Market Predictions for 2027

**Products**
- Extruded Potato Snacks: Shaping the Future of Healthy Snacking

**Ingredients**
- Stabilizers/Functional additives

**Storage Special**
- Store Preparation and Hygiene
- Bulk vs. Boxed Storage

**Trade shows:** Preview of 2027 Event Calendar


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