

Food Processing *World*

For the people who run food and potato processing lines

Cover story · Export data

Where India's fries go

2,77,109 tonnes left India last year. Ten countries took 83.7% of them.

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Anuga FoodTec India at 20

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Thirteen suppliers, five questions



Photo: Ron Lach / Pexels

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Leaders, in their own words

Our first issue was about machines and numbers. This one adds people.

On page 14 Herman Verveld of Royal HZPC Group speaks for himself. We did not interview him; we took his talk at Global Potato Summit 2025 from the organiser's recording and printed what he said, in the English he said it in, with our cuts marked. On page 18 the people behind McCain's agreement to buy Falcon Agrifriz's potato business, and the head of HyFarm, say where they think the business goes next, in the words of their own releases.

We have also opened the magazine to opinion. Sovindra Chaudhary, who moves potatoes from farm gate to factory for a living, writes on

page 19 about the costs a freight bill never shows. On page 37 Devendra K Jha asks why only one Indian potato in ten reaches a factory. Columns are signed, and they are the writers' views, not the magazine's.

The leader profile on page 28 is a sample layout. The person and the company are invented, and the page says so. We will fill that slot with real plant heads and founders; if you run a line and have a story worth telling, write to us.

The buyers' guide on page 42 now lists thirteen suppliers, each from its own literature. Use the five questions with all of them.

As before: every number comes from somewhere you

"Columns are signed, and they are the writers' views, not the magazine's."



Photo: Brunxs / Pexels

The editors (sample)

Food Processing World

Food Processing World

The magazine of
foodprocessingworld.com. Sample
issue 02, November–December 2026.

Editorial

The Food Processing World desk.
Stories marked IndianPotato.com first
appeared there, cut for length.

Design and production

DigiMagz, Pune. Photos: Pexels,
credited on each page.

Advertising

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Photo: masudar rahman / Pexels

India in brief

EXPORTS

Uttarakhand ships its first frozen fries: 24 tonnes to Iraq

APEDA said on 20 July 2026 that it had facilitated the first export of frozen French fries from Uttarakhand: 24 tonnes from Kashipur, in Udham Singh Nagar district, to Iraq. The exporter was Virun Global Trade Pvt. Ltd. APEDA put India's potato-product exports for FY26 at \$289.40 million.

Source: APEDA, via IndianPotato.com, 22 July 2026

POLICY

Potato is the ODOP in 17 districts: what PMFME pays a processor

Under the PM Formalisation of Micro Food Processing Enterprises scheme, potato is the One District One Product in 17 districts across 9 states. A potato unit there is first in line for the credit-linked subsidy of 35% of the project cost, up to ₹10 lakh for a single small unit, and only ODOP products get the scheme's money for shared infrastructure: 35%, up to ₹3 crore, for FPOs, SHGs and cooperatives. Madhya Pradesh has the most potato districts: Chhindwara, Dewas, Gwalior and Indore.

Source: IndianPotato.com, 19 October 2026

EVENTS

India Potato Summit comes to Lucknow on 26–27 November

The India Potato Summit 2026 runs on 26 and 27 November at the Pluto Auditorium, Indira Gandhi Pratishthan, Lucknow. It is organised by CARD with Uttar Pradesh's Department of Horticulture and Food Processing. A 3 m × 3 m stall costs ₹80,000 plus GST.

Source: IndianPotato.com, 19 October 2026

SEED

Haryana puts 2,194 quintals of potato seed on sale

The Potato Technology Centre at Shamgarh, Karnal, has 1,799.5

quintals of Kufri Pukhraj and 394.5 quintals of Kufri Mohan seed on sale, plus 70,000 Kufri Frysona tubers sold by number. Booking is on the Horticulture Department's portal, nursery.hortharyana.gov.in.

Source: Horticulture Department, Haryana, via IndianPotato.com, 18 October 2026

RAW MATERIAL

Four chipping clones for the south and east

Sixty advanced clones went through four years of trials in Karnataka, Tamil Nadu, Telangana and West Bengal. Four came through with the chip colour, dry matter above 20% and low defects a factory needs: MP/12-126, MP/14-171, MP/15-698 and MP/15-651. They are not released varieties yet.

Source: IndianPotato.com, 14 September 2026

SHOWS

Anuga FoodTec India sets 2027 dates, and a dairy edition

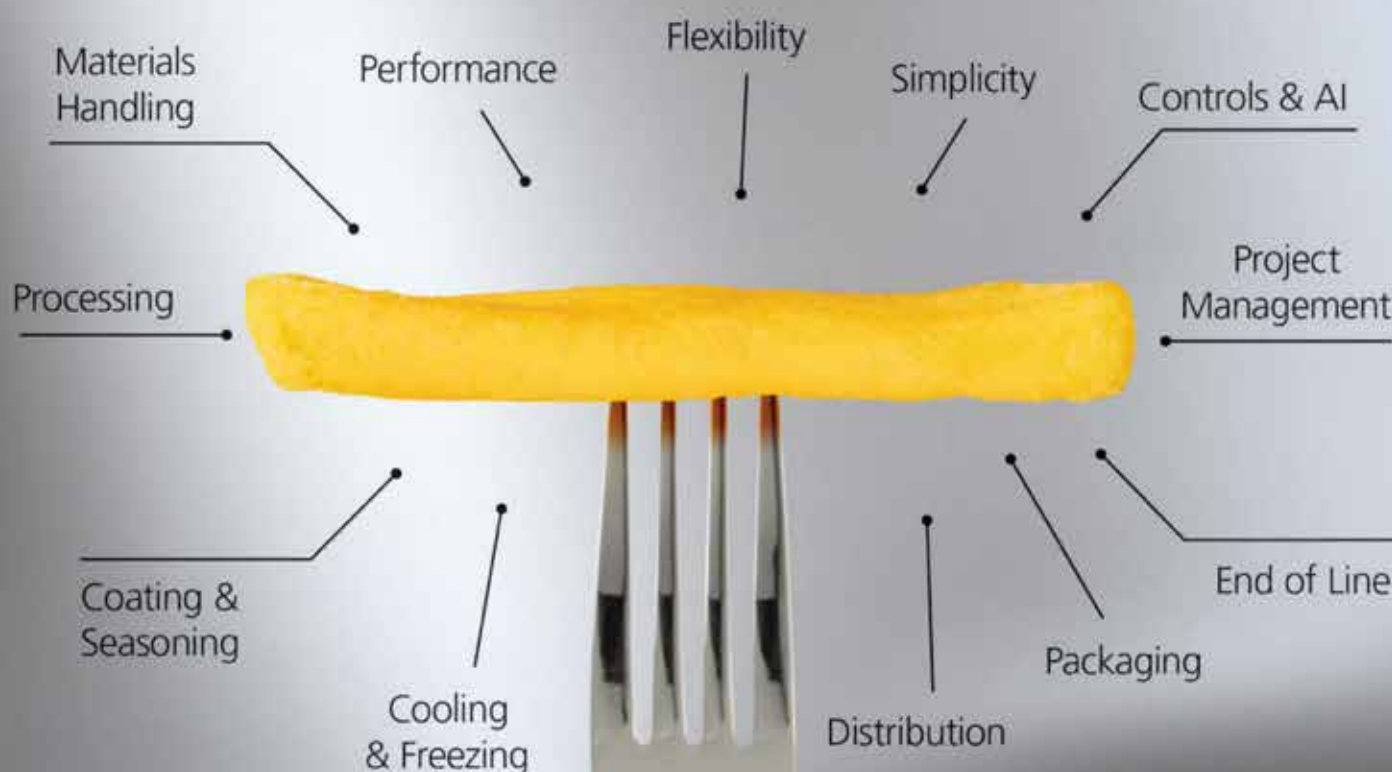
The show guide for the 2026 edition gives the next dates: Anuga FoodTec India and Anuga Select India return to the Bombay Exhibition Centre, Mumbai, on 26–28 November 2027. A dairy edition, Anuga FoodTec India Dairy, is set for 28–30 April 2027 at Bharat Mandapam, New Delhi.

Source: [Anuga FoodTec India 2026 show guide](https://AnugaFoodTecIndia.com)



Photo: Enzo Renz / Pexels

the perfect bite



We put a lot into this one perfect fry.

The world in brief



Photo: Freek Wolsink / Pexels

PACKAGING

TNA brings robag Quantum to PACK EXPO

TNA Solutions is showing the robag Quantum, the next generation of its robag vertical bagmaker, at PACK EXPO International in Chicago (18–21 October 2026), ahead of release in 2027. The company says it aims for more output per tube, rated at up to 300 bags a minute on a single tube depending on bag, film and product, with autonomous set-up.

INSPECTION

Ishida takes integrated packing to Gulfood Manufacturing

Ishida Europe will show the Inspira iTPS snack packing system, a CCW-AS multihead weigher set up for frozen food, the QX-500 tray sealer, IX-PD X-ray inspection and a DACS-GN-SE checkweigher with



Photo: cottonbro studio / Pexels

an integrated CEIA metal detector in Dubai, 3–5 November 2026.

SORTING

Tolsma-Grisnich puts an optical sorter on the intake line

Optica S fits at the receiving hopper and removes stones, clods, rot and foreign objects before potatoes go into store. A screen belt takes off loose soil first. The company says the compact Optica Q checks seed potatoes as fast as three people in an inspection room.

END OF LINE

SOMIC shows a compact cartoner

SOMIC Packaging is introducing its compact SOMIC 202 cartoner to the US, rated at up to 20 cartons a minute, beside the SOMIC 434 series, which packs trays, wraparounds and tray-and-cover cases on one machine at up to 32 cycles a minute.



Photo: Handi Boyz LLC / Pexels

PRODUCTS

Lamb Weston par-fries in an olive oil blend

Lamb Weston has launched a fry and a puff par-fried in a proprietary olive oil blend made for high heat. It cites its own 2025 study: 74% of respondents said they would order fries cooked in olive oil and 52% would pay a premium.

LABORATORY

Fry moisture and fat in five minutes

CEM says its SMART 6 and ORACLE instruments cut moisture and fat testing of French fries from up to 16 hours with oven and Soxhlet methods to under five minutes. In its limited study on two frozen fry samples, results agreed closely with the AOAC reference methods.

All six items: company releases as published in Potato Gazette International, September 2026. Figures are the companies' own.



Photo: Marieke Jung / Pexels

News • Companies

McCain agrees to buy Falcon Agrifriz's potato business

On 12 October 2026 McCain Foods announced an agreement to acquire Falcon Agrifriz Foods' frozen potato processing business in Gujarat. Falcon's fully automated plant at Kadi, Mehsana, built in less than two years, comes with more than 450 employees and links to more than 1,000 Gujarat farmers. McCain, which started in India in 1998 with a team of three, employs more than 940 people directly and works with more than 2,500 farmers. The price has not been disclosed; the deal closes once customary conditions are met.

Source: McCain Foods release, 12 October 2026, via IndianPotato.com

HyFarm Paathshala graduates its second batch of Farmer Champions

HyFarm, the agribusiness unit of HyFun Foods, has held its second HyFarm Paathshala Convocation, it said in a release dated 15 October 2026. The programme runs 33 demonstration farms across 17

micro-clusters in Sabarkantha and Banaskantha, Gujarat, on a Train-the-Trainer model. HyFarm says the graduating farmers have taken improved practices to more than 6,000 fellow growers, and that participating farmers recorded about 10–12% lower cultivation costs, about 15% savings on fertiliser and 30–35% savings in irrigation water.

Source: HyFarm release, 15 October 2026, via IndianPotato.com, 17 October 2026

Happiyum to hire for 100+ roles at its Kadi plant

Happiyum, the frozen potato brand of Ratani Global Private Limited, is hiring for more than 100 roles at its plant in Kadi, Mehsana district, Gujarat, and invites freshers and experienced people. The full list of openings goes live on 8 November 2026. The company makes frozen fries, flakes, starch, hash browns, wedges and nuggets, and exports to Indonesia, Thailand and Malaysia. It says the plant makes 35,000 tonnes of products a year on a site of 3,00,000 sq ft.

Source: IndianPotato.com, 19 October 2026; plant figures are the company's •

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Export data, HS 200410:

Where India's fries go

India shipped 2,77,109 tonnes of frozen French fries and other prepared potatoes between April 2025 and March 2026. One country took more than a fifth of it. Here is the map, buyer by buyer.

By Devendra K Jha, First published on IndianPotato.com, 1 October 2026

The Philippines bought the most Indian fries, 61,667 tonnes, or 22.3% of the total. Saudi Arabia came second with 44,176 tonnes and Malaysia third with 28,987. The top ten countries took 2,31,844 tonnes, which is 83.7% of everything India shipped.

Half to Southeast Asia, a quarter to the Gulf

Five Southeast Asian countries took nearly half of India's fries: the Philippines, Malaysia, Thailand, Indonesia and Vietnam together bought 1,34,533 tonnes, or 48.5% of the total. The Philippines alone bought more than Malaysia and the UAE together.

The Gulf took about a quarter. Saudi Arabia, the UAE and Oman together took 74,355 tonnes, or 26.8%. Saudi Arabia was India's second-largest buyer, and on its own took 59% of the fries that went to the Gulf.

Japan and Taiwan, the two East Asian buyers in the top ten, took 22,956 tonnes between them, 8.3% of India's fries exports. Japan, at 14,642 tonnes, was the largest buyer outside Southeast Asia and the Gulf.

Beyond the top ten

All other countries together took 45,265 tonnes, or 16.3% of the total. That is only a little more than Saudi Arabia bought on its own.

The product is frozen French fries and other prepared potatoes, HS code 200410: potatoes prepared or preserved other than by vinegar or acetic acid, frozen. The period is India's financial year, 1 April 2025 to 31 March 2026. Each share is the country's tonnes divided by 2,77,109.

Country by country

1. Philippines, 61,667 t. India's biggest buyer by a wide margin, taking more than Malaysia and the UAE together.

2. Saudi Arabia, 44,176 t. The largest buyer in the Gulf, with 59% of everything the three Gulf countries in the top ten took.



Photo: Wolfgang Weiser / Pexels

3. Malaysia, 28,987 t. About one tonne in every ten that India shipped.

4. UAE, 18,862 t. The second Gulf market, just ahead of Thailand.

5. Thailand, 17,650 t. One of five Southeast Asian countries in the top ten.

6. Indonesia, 16,526 t. Close behind Thailand, at 6.0% of the total.

7. Japan, 14,642 t. The largest buyer outside Southeast Asia and the Gulf.

8. Oman, 11,317 t. The third Gulf market in the top ten.

9. Vietnam, 9,703 t. The fifth Southeast Asian country on the list.

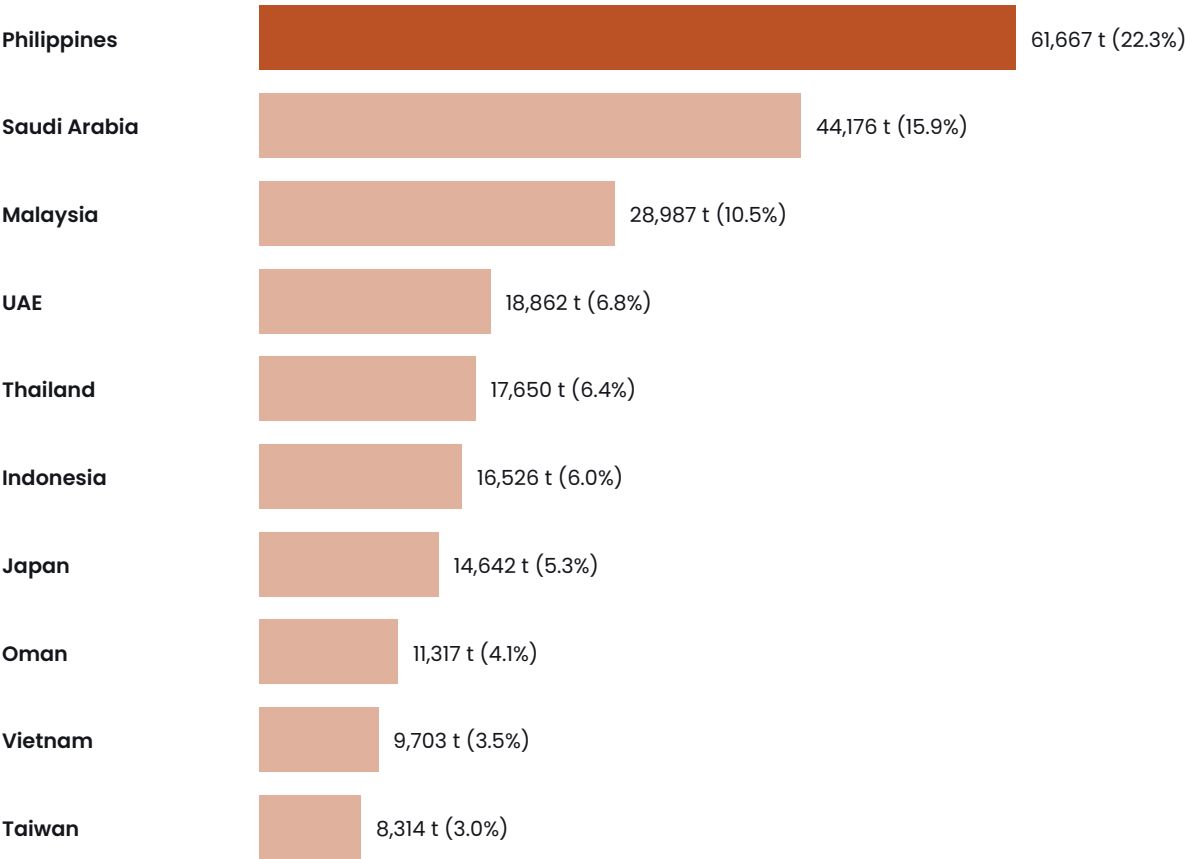
10. Taiwan, 8,314 t. Rounds out the top ten; with Japan it makes up 8.3% of India's fries exports. •



Frozen fries are India's fastest-growing processed potato export. Photo: Engin Akyurt / Pexels

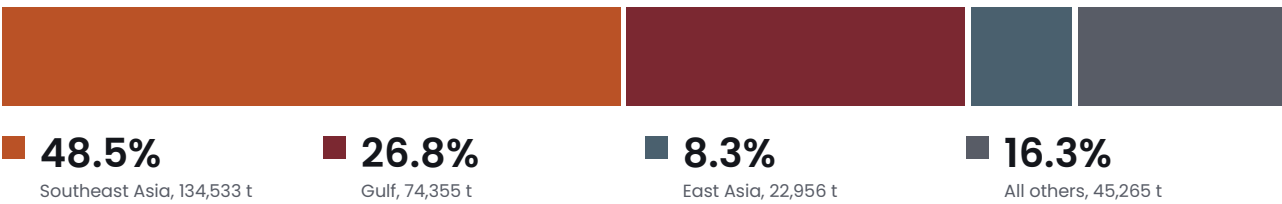
The buyers, ranked:

Ten countries took 83.7% of it



Tonnes, April 2025 to March 2026. Share of India's total of 2,77,109 tonnes.

By region



“The Philippines alone bought more Indian fries than Malaysia and the UAE together.”

2,77,109 t

frozen fries and prepared potatoes
exported, FY 2025–26

83.7%

of it taken by the top ten buyers

48.5%

went to five Southeast Asian
countries

Source: HS 200410, FY 2025–26 (1 Apr 2025 – 31 Mar 2026). Share = tonnes ÷ 2,77,109.



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Seed potatoes. Stock photo: Dptc India / Pexels



Herman Verveld at the Global Potato Summit 2025. Frame from the summit recording.

Herman Verveld, Royal HZPC Group:

“A unique opportunity for India”

Herman Verveld, Chief Commercial Officer of Royal HZPC Group, told Global Potato Summit 2025 where potato demand is going and what that asks of India’s growers, breeders and processors. These are his words, from the organiser’s recording.

From his talk at Global Potato Summit 2025

On India’s place in the world

One of the first trends is of course the world because India is a global player, you are number two in

potato. So that means also you have to deal with global issues and it’s happening today. The second thing is climate, it’s mentioned

earlier an important impact and climate keeps on moving and developing. And the third one I think that is population demographics. ...

And actually what this picture is showing, where is the population happening? The population is happening in the country like India, in neighbor countries and you see in Africa. So that's a unique opportunity for India because it has a big home market which keeps on growing. But it also has a lot of opportunities in surrounding areas.

On trade politics

But there is always an "if", that means if you want to make use of the population in other markets, you also have to be a global player and you have to look also about the second issue, the world and the trade politics. And yes it's happening, you do already consumption, yes there is

On learning from other countries

So then looking to India specific and what is then the shape of the Indian potato business in the future. I take two models and two models which are connected to each other. And I do think in India and I do see that you do that already, you can learn a lot about

what happens in other countries. Because where today India is, many other countries or continents were there many years ago. So it's also good to learn and to learn from mistakes made, but also to improve fast. And that's in one way you are doing, but I still think there are a lot of opportunities.

On the final consumer

For me, as also as a breeder, the most important is our final consumer. Finally, that's the person who are consuming the potatoes. And we have to understand that final consumer, because then we can really create the business and we can make products. This is a model where you are seeing food choices compared to food perception. And I'm saying don't invent the wheel yourself, look about what happens in other countries. If I'm plotting some of the countries and continents, you see that they have been to the same

happening some export, processing is happening in certain way.

On seed exports from India

But if I'm looking from a potato seed breeder, I also do see nice opportunities for India doing seed exports. Today it's almost impossible to do that. So it is important that also from the government point of view, borders are opened also to have bilateral agreements with other countries. Because there is a unique opportunity for India.

On the potato against other crops

But first on potatoes, the market of potatoes is huge. And if you

compare potato compared to maize or rice or other wheat, you see that they are in a different position than we are today with potatoes. We still can gain a lot. And yes, we are growing the business in the last years and we make very nice growth. But we have a lot of opportunities to make that growth much more. Potato compared to other crops, it's a very nutritional food. It is also sustainable and it is also a product, a crop, which you can grow in many circumstances. It asks challenges, but it is possible. So why not do we see more and can we develop more with the potato business worldwide?

"It's all about convenience, it's all about enjoying, and that will continue."

development. Development sometimes over years, but as India you can do that faster by understanding that. So you see here that India is here on the left bottom corner. I do see that already you are moving in certain parts to the next corner, but it is important to understand that. It's not a question of only producing, it's important to understand where your own population in your home market, but also in other markets are moving. And the more you read that, the more you understand that, the more you can adapt yourself to those circumstances.

On home delivery and the next generation

But what do we see today already? I hear already in the big cities, 85% of you are buying home delivery. You are not going to retailers anymore, you are not buying on the corners for the fresh market. Which has big influences, because home

delivery is asking for different product profiles, different potatoes. It's the same processing, you see it yourself, how that is growing in the last year. It's all about convenience, it's all about enjoying, and that will continue. Because if you are going to look about the next generations, our kids, they are talking about enjoying, they are talking about fun, they are talking about variation. And it should be easy cooking, and it should be also conscious, because they are also thinking about sustainability of things. So the more we understand that, the more we can shape and adapt ourselves to that.

On differentiation

But there is one word that constantly comes, it's differentiation. Differentiation is very important. If I look today to the table market in India, 90% of your potatoes, it's still very traditional. And the next step, what is going to

happen, because it happens in many countries' continents, is going to this differentiation. And home delivery is one part of it, but also the consumers of the future. So it is very important, and I gave some examples. Today we see that varieties, and if you do home delivery, you need finer grading. You need varieties which are washable. You need varieties which are better in the presentation. So there are differences, that means also new varieties are coming in, and they will be picked up, and they are already picked up. And those varieties, I must say, will have an added value.

On new processing varieties

Today, in the processing, and with respect for the varieties, varieties like Santana and Innovator are crosses made in the 80s. Today we are trying to introduce as potato industry new processing varieties, crosses made after 2010. And if you look to this overview, these are varieties which has already much more added value. But that's one thing, you should not grow them on the same way like the old varieties today. Every variety needs different way of growing and adaptability. And if you are not changing that, those varieties will not give you much more, and they will not give you the differentiation what is needed. So that means also that as potato value chain, we need to have the capability to adapt ourself and to learn and keep on learning about how to grow varieties, and

not doing it on the old way, no. And I know a variety like Santana, which is in the processing, and if I would ask some of the processes working with the variety for many years, it took in the beginning of Santana also a long time before the real recipe to produce a good Santana was found. So we need to put a lot of energy, but also a lot of competences and learning to make varieties big.

On genetics, environment and management

And the performance of any crop, but I take here potato, if you go, it has to do with, in one hand, the genetics, the environment, the management, and also some social management. And that means if you go from the left side, and we call it undeveloped, and we are going to develop, and we are talking about rural to industrial, then there are many aspects. And all those aspects are needed to perform very well to make it a success. Because if you miss some, it will not work. So it starts with the performance, production, and you talk about quality, you talk about income, ... It starts about varieties, I just mentioned. Varieties have all their own recipe to make them a success. If you don't want to adapt yourself in that way, it will be difficult to make the varieties very strong and successful. But it also starts about the circumstances. Because your circumstances, where you are growing the varieties, these may be another management. And it's another way

of soil. And look about climate. Climate in Gujarat is different than here in UP, which means also different management. And then you talk about the things about the quality.

On twelve years of breeding in India

Yes, as potato breeders, we also have a responsibility. And I do think that we, as potato breeders, are really looking about the adaptability and the adaptability of our varieties. We are, as Royal HZPC Group, we are more than 12 years in India. And still we are learning. You have a lot of microclimates. So we have to learn, and we have to understand what does that mean for potato breeding. That means also the abiotic stress circumstances are very different. And also we see that the climate last year, during the potato season, compared to this year, is already different. So we have to deal with all these kinds of changes. And what we have to do is to bring in genetics, which can deal with these climate changes, which can deal with different diseases. But more important, they are more adaptable. And they can handle those kinds of different things, which is a big challenge, which is a big challenge. Because it's not a question of let's make it and bring it. But this is what we are doing as potato breeders. We want also to take care that India, for their own market, but also for a part in the world, that it will be successful. That's my part. •



Herman Verveld, 'Global Trends in Potato Demand, Production and Processing and India's Future Role', Expert Insights session, Global Potato Summit 2025, National Capital Region. Transcribed by IndianPotato from the organiser's recording and checked against the video and slides. Spoken English kept as said; lightly cut, marked Headings are ours; they are topics, not questions put to him. His figures (85% home delivery in big cities, 90% of the table market traditional, more than 12 years in India) are his own, as said. Photos: Wolfgang Weiser, Wolfgang Weiser, Erwin Bosman / Pexels.



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Photo: Patrick / Pexels

Voices:

What next for India's frozen potato business

Six people at the centre of this autumn's news, in the words their companies published.

"India continues to be a priority growth market for McCain Foods. This acquisition reflects our confidence in the Indian market and builds on nearly three decades of continued investment in our people, local operations and agricultural partnerships."

Pierre Danet

Regional President, Asia Pacific and South Africa, McCain Foods
McCain Foods release, 12 October 2026

"We look forward to welcoming Falcon employees and growers to the McCain network and continuing to create local employment opportunities and support regional industrial development as we enter the next phase of our long-term growth in India."

Aditya Krishna

Managing Director, McCain Foods India
McCain Foods release, 12 October 2026

"McCain shares our values and our confidence in the growth potential of India's frozen food market. As a global leader in frozen potato products, McCain is the right company to build on the strong foundation we have established at Falcon Agrifriz and take the business forward."

Manish Tibrewal

Director & CEO, Falcon Agrifriz
McCain Foods release, 12 October 2026

"We are proud of the modern, fully automated processing facility we have built at Falcon Agrifriz in less than two years, and

especially proud of the talented employees and growers who have helped bring it to life."

Parthajeet Patnaik

Vice Chairman, Falcon Agrifriz
McCain Foods release, 12 October 2026

"HyFarm Paathshala brings traditional farming wisdom and modern agronomy together to help farmers reduce costs, conserve resources and improve quality and profitability. Seeing experienced growers, young farmers and women farmers become trainers and mentors brings this vision to life. Their commitment to sharing knowledge is building a stronger potato ecosystem."

Soundararadjane S

Chief Executive Officer, HyFarm
HyFarm release, 15 October 2026

"Paathshala farmers are demonstrating an entrepreneurial nature by connecting cultivation with innovation, greater productivity and opportunities to improve their earnings. Their enthusiasm for adopting better practices is encouraging. By learning together, sharing their experiences and supporting one another, they can extend this progress beyond their own fields and create greater opportunities for their communities."

Dr Sudhanshu Singh

Director, CIP South Asia Regional Center (CSARC), and Regional Director for South Asia, International Potato Center (CIP)
HyFarm release, 15 October 2026

Quotes are from the companies' releases as published, word for word, on IndianPotato.com (12 and 17 October 2026). •

Guest column:

The costs the freight bill hides

Diesel, waiting hours, empty kilometres and rejected loads never appear on a transporter's invoice.

By Sovindra Chaudhary, First published on IndianPotato.com, 21 August 2026



Sovindra Chaudhary
Guest column

"Potato may be a low-value commodity, but potato logistics are not a low-cost operation."

I have spent six years moving potatoes — from the farm gate to cold storage, and from cold storage to the factory. If I compress what that taught me into one sentence, it is this: potato logistics is not about arranging a truck.

Arranging the truck is the part everyone can see. The work is holding time, distance, diesel, vehicle availability, labour, road conditions, quality, storage capacity, loading, unloading and rejection risk in the same hand — at the same time, for the length of a season. Nearly all of what that costs sits outside the freight rate, which is why a logistics operation can look cheap on paper and still lose money every week.

Every figure below is a worked example, chosen to demonstrate a method — a truck returning 4 km/L, diesel at ₹90 a litre, a 16 MT load, a 300 km lane. They are illustrative arithmetic, not observed market rates, and they are not drawn from any company's books.

01 Diesel: the line everyone watches and still understates

Fuel is the single largest component of road transportation cost, and the mistake I see most

often is reading a pump revision as a small number. A ₹5 rise does not add ₹5 anywhere. It adds a fraction to every kilometre you run, and then that fraction is multiplied by the whole season.

The control: a written diesel escalation mechanism inside the seasonal contract. Once the formula is agreed, a pump revision becomes an arithmetic adjustment both sides can calculate — not a renegotiation in the middle of harvest, when you have no leverage.

09 Rejection is a quality event that arrives as a logistics bill

A rejected truck is not only a quality failure. It is return freight, unloading, reloading, waiting time, additional handling and a hole in the inventory plan — all incurred on a consignment that travelled the full distance and delivered nothing.

Sixteen tonnes moved, fuel burned, hours spent, and the delivery not achieved. That is the reason pre-dispatch quality control is not paperwork. It is the cheapest checkpoint in the entire chain, because it is the only one that happens before the money is spent.

Illustrative · truck at 4 km/L

Fuel cost per kilometre, diesel at ₹90/L:
₹22.50 / km

Fuel cost per kilometre, diesel at ₹95/L: ₹23.75 / km

Added cost on a 300 km trip: ₹375 / trip
Across 1,000 trips: ₹3,75,000

Illustrative · ₹30/km operating cost

Saving if backhaul planning removes 100 km:
₹3,000 / trip

Across 1,000 trips: ₹30,00,000

10 Empty kilometres: the most overlooked line in the ledger

Empty running is the cost I find least often measured and most often available. A vehicle that runs 300 km loaded and 300 km back empty has moved 600 kilometres to do 300 kilometres of work — and every one of those return kilometres burns the same diesel, wears the same tyres and consumes the same driver hours as a loaded one.

The actual saving depends on route, vehicle type, mileage and freight structure, and no backhaul plan removes every empty kilometre. But this is the clearest example on the page of logistics planning creating value without anyone sitting across a table and pushing a transporter's rate down. Sovindra Chaudhary is Executive, Agro Supply Chain Management, at Agristo Masa Pvt. Ltd., and has worked for over six years in potato logistics, transportation and agro supply chain management. •

Processing lines:

Three ways to get more from a fry line you already own

Replacing a French fry line is the expensive answer. Three makers argue for fixing the bottleneck instead. Here is what each claims, and how to test it.

By the Food Processing World desk

Most fry plants in India are young, and most of their owners would rather add capacity than rip out a line that is barely paid for. That makes the European argument of the moment worth hearing: upgrade the stage that holds the line back, and judge the result by the cost of each kilogram of saleable product.

Recirculate the water

Heat and Control says a bottleneck at any stage can limit the whole line: more fryer capacity is of little value if upstream equipment cannot keep up the feed. "New technology only creates value if it's right for the process," Greenaway says. "Processors need to understand where it fits, how it will affect the rest of the line and what it will contribute."

Heat and Control's Sam Greenaway, the company's industry manager for French fries, makes the case for targeted upgrades over full replacement. Its Cascade water recirculation system, with a slice-wash module that removes starch and silt, was built for chips and is now used on fry lines. The company says it cuts freshwater use by up to 75%. Its Tek-Dry dryer can run on hot water heated by energy recovered from the fryer exhaust, and its FastBack 4.0 conveyor has, it says, 80% fewer moving parts.

Treat the potato before the knife

Elea's pulsed electric field (PEF) system opens the potato's cell walls before cutting. The company claims up to 50% lower cutting force, up to 50% less breakage, 10% less starch loss, up to 10% less oil absorbed and up to 60% fewer knives, with a payback of 12 to 18 months. In its worked example for a 26 tonne-an-hour line running 7,700 hours a year, yield rises by 957 tonnes a year. The large water and energy savings in that example apply only where PEF replaces a thermal pre-heater.

Stop breakage at the transfers

Dutch TecSource says most breakage in a screw blancher happens where product enters and leaves. Its Blancher 2.0 has redesigned Ferris wheels and discharge, and the company says it is the first screw blancher that can handle curly fries. DTS reports more than 650 blanchers installed, and offers the new design as a retrofit.

How to judge the claim

Before you talk to any maker, measure your own line for a month: throughput, downtime, water, oil and energy per tonne, and saleable yield. Ask for the maker's

figures on your variety and your cut, and for a site you can visit. Then compare the upgrade against its effect on cost per kilogram, not against the price of a new line.

"The most valuable upgrade is not necessarily the one that delivers the biggest increase in output," Greenaway says. "It is the one that improves the performance of the operation and delivers a measurable return."

Company claims as published in Potato Gazette International, September 2026, pp.



*22-23,
28-29,
32-33.*



Photo: Tanvir Khondokar / Pexels

"New technology only creates value if it's right for the process." Sam Greenaway, Heat and Control"

Sample advert reproduced from Potato Processing International for layout demonstration.



The addition of DALSORB® oil purifier can help to reduce oil discard by up to **90%** and lower oil management costs by up to **77%**.

DALSORB® keeps your food wholesome and removes undesirable compounds to keep frying oil clean from:

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Machine focus:

Form-fill-seal: choose the system, not the machine

Photo: cottonbro studio / Pexels

A vertical form-fill-seal machine makes the bag, fills it and seals it in one cycle. What it really costs you depends on the filler, the film and the changeovers.

By the Food Processing World desk, From foodprocessingworld.com

A form-fill-seal machine makes a pack from a flat roll of film, fills it and seals it in one continuous cycle. On a vertical machine the film is pulled over a forming shoulder and wrapped around a hollow tube. A vertical jaw seals the long back seam, a horizontal jaw makes the bottom seal, product drops through the tube, and the same jaw then seals the top of that bag and the bottom of the next one before cutting it free.

The machine sits at the centre of the packaging station. Upstream, a filler portions the product. Downstream, packs usually pass a checkweigher and a metal detector before case packing. So the choice is really about a small system.

Vertical or horizontal?

Vertical machines fill downwards, so gravity does the work. They suit snacks, frozen food, cereals and powders in pillow, gusseted and

block-bottom bags, and they fit a smaller floor area. Horizontal machines carry the film through separate stations, which suits stand-up and shaped pouches with zippers and caps, and products that must be placed rather than dropped.

Match the filler to the product

Chips, nuts and frozen vegetables go to a multihead weigher, which weighs many small hoppers at once and releases the combination closest to the target. Powders go to an auger filler. Liquids and pastes need a flow or pump filler. The filler often limits how fast the whole line runs.

Ask for a tested speed

Intermittent-motion machines stop the film for each seal; continuous-motion machines move the jaws with the film and run faster for long periods. Treat every speed figure as specific to one product. One maker quotes up to 300 bags a minute for

its fastest vertical series and states that actual output depends on product, bag format, film and line. Ask for a speed tested on your product, your film and your bag size.

Seal, gas and hygiene

Good seals come from the right time, temperature and pressure on clean film. Fried snacks and nuts are often nitrogen-flushed: nitrogen displaces oxygen and slows

rancidity, and it cushions the product. Ask how residual oxygen is measured. Check the product zone for ledges where product can collect, and whether parts come off without tools. •



Photo: cottonbro studio / Pexels

Sixteen machines, by the makers' own figures:

Maker	Model	What it packs	Rated speed	Max bag width
Ishida	INSPIRA NS25	Snacks, intermittent motion	10–120 bags/min	–
Ishida	INSPIRA CS25	Snacks, box motion	10–160 bags/min	–
Ishida	INSPIRA CS33	Snacks, box motion, wide	10–150 bags/min	330 mm
Ishida	INSPIRA RD25	Snacks, rotary motion	up to 250 bags/min	250 mm
Ishida	INSPIRA RD33	Snacks, rotary motion	up to 200 bags/min	330 mm
Nichrome	Maxima 200	Powders, servo auger	–	–
Nichrome	Maxima 400	Powders, servo auger	up to 400/min (dry run)	–
Nichrome	Wing 200 E-Line	Chips, namkeen, biscuits	–	–
Sanko	FC80	Powder sticks, 1–2 lanes	–	–
Sanko	FC1000GL	Powder sticks, multi-lane	–	–
Sanko	FC1000GW	Powder sticks, wide multi-lane	–	film 1,020 mm
Pace	P200 Ecoplus	Snacks, namkeen, pellets	–	–
Pace	P250 Ecoplus	Snacks, namkeen, pellets	–	250 mm
Pace	P350 Ecoplus	Snacks, namkeen, pellets	–	125–350 mm
Pakona	PK-70	Pillow, gusset, block-bottom bags	–	–
Pakona	PK-70 Large	Pillow, gusset, block-bottom bags	–	350 mm

– = not published by the maker. Source: makers' brochures and product pages, checked 1 October 2026. Full specifications: foodprocessingworld.com/form-fill-seal-machines

Food safety:

Weigh every pack. Then look for metal.



Photo: Mark Stebnicki / Pexels

Checkweighers and metal detectors sit at the end of almost every packing line. What each does, the rules they help you meet, and eleven checkweighers compared.

A checkweigher is an inline scale that weighs every pack while it moves. An infeed belt spaces the packs and brings them to speed; a weigh belt sits on a load cell, either a strain-gauge cell or an electromagnetic force restoration (EMFR) cell for high-speed, high-precision work; a reject section removes packs outside the limits and the machine records every result.

The rules it helps you meet

A checkweigher does not make a pack legal on its own. In the European Union, packs carrying the E mark follow three packers' rules under Directive 76/211/EEC: the batch average must not be below the declared quantity, only a small share of packs may be short by more than the tolerable negative

error, and no pack may be short by more than twice that error. The tolerable error runs from 9% for packs of 50 g or less to 1.5% for packs of 1 kg or more. In the United States, officials use NIST Handbook 133.

Accuracy against speed

The faster a pack crosses the weigh belt, the fewer readings the machine can take. Vibration, draughts from refrigeration and packs that bounce or tilt all add noise. So no single accuracy figure is worth comparing across makers. Give each maker your packs and line speeds, and ask for the accuracy they will guarantee on your pack, proven in a test.

How a metal detector works

Most food metal detectors use a balanced three-coil design: a

transmitter coil between two receiver coils around the aperture. With no metal present the receiver signals cancel out. A metal fragment upsets the balance, and the signal triggers a reject device.

Sensitivity is stated separately for ferrous, non-ferrous and stainless steel test pieces. Wet or salty products give their own signal, called product effect, so detectors are set up and tested on real product. A standard balanced-coil detector cannot inspect product in aluminium foil: inspect before packing, or use a ferrous-in-foil detector or X-ray. Detectors are often placed after packaging, so nothing can enter the pack after inspection, and are often combined with a checkweigher on one frame. •

How a checkweigher works



1 Infeed

spaces the packs and brings them up to speed



2 Weigh

the belt sits on a load cell; many readings make one weight



3 Reject

packs outside the limits are pushed off; every result is logged

Buyers' table:

Eleven checkweighers, by rated speed

Maker	Model	What it is	Rated speed
WIPOTEC	HC-A	High-speed series, EMFR weigh cells	up to 600 pcs/min
WIPOTEC	HC-M	Medium range, stainless housing	up to 250 pcs/min
WIPOTEC	HC-M-WD	Wash-down, IP69K components	up to 250 pcs/min
WIPOTEC	HC-M-MDi	With integrated metal detector	up to 250 pcs/min
WIPOTEC	EC-E	Entry level, 8-inch touchscreen	up to 150 pcs/min
Minebea Intec	Flexus	Hygienic design, EMFC cell, 1–7 kg	up to 600/min (1 kg)
Minebea Intec	Synus	Modular; can regulate fillers	up to 250/min (1 kg)
Minebea Intec	EWK WS 10/20 kg	Heavy load, up to 20 kg	up to 200 items/min
LOMA	CW3 1500L	Packs to 1,500 g; typical accuracy 0.18 g	–
LOMA	CW3 RUN-WET 1500L	IP69–tested washdown	–
Ishida	DACS-GN-F015	EMFR module, packs to 1.5 kg	up to 480 ppm

Rated speeds are the makers' own; ask for a test on your pack. Source: makers' datasheets, checked 1 October 2026; foodprocessingworld.com/checkweighers

Sample advert reproduced from Potato Processing International for layout demonstration.

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Processing lines:

How a potato chips line works



A potato chips machine is not one machine. It is a line of seven stages — destone and wash, peel, slice, wash and blanch, de-water, fry, then de-oil and season — and each one hands the next a condition it cannot fix later.

By the Indian Potato Team, First published on IndianPotato.com

Photo: icon0 com / Pexels (cut out)

A slicer set half a millimetre wrong cannot be corrected by the fryer. Every chips line runs this sequence, whether it is a small semi-automatic set or a continuous plant. What changes with scale is how much of it runs without a person standing there. Frying is a drying process that happens to use oil. A slice enters at roughly four-fifths water and leaves at a fraction of that, and the oil's job is to carry heat into the slice fast enough to drive the water out before the surface scorches.

Two things therefore matter more than the fryer's headline size: whether the oil holds its temperature when a cold load hits it, and how quickly the whole volume of oil turns over.

Why the fryer decides the chip

Ask any chips maker what goes wrong and the answers cluster in one place. The chips came out dark. The colour was patchy across

the batch. They went soft in the packet inside a fortnight. They tasted heavy. All four are frying faults, and three of them are temperature faults.

When cold, wet slices meet hot oil, they take heat out of it very quickly. If the oil cannot be brought back up fast enough, the slice sits in oil that is too cool, which is exactly the condition that produces a greasy chip: the water leaves slowly, the surface never seals, and oil moves in to fill the space the water left. Chips that feel heavy are usually chips that were fried too cold, not chips that were fried too long.

The opposite fault is local overheating. If oil is heated by a flame or an element directly beneath the pan, the oil touching that surface is hotter than the bulk of it. That oil degrades faster, darkens, and passes its colour to everything that passes through. Patchy colour across a single batch usually means the oil was not one temperature.

What the potato has to be first

No fryer rescues the wrong raw material, and this is where most new chips ventures in India lose money before the machine is ever at fault. Two properties decide whether a tuber can become a chip. Dry matter is everything in the potato that is not water; it is what you are actually selling, and a low-dry-matter potato both yields less and absorbs more oil. Processing grades need at least 20%, with 21–25% the working range. Reducing sugars are the browning fuel described above.

The gap between a processing variety and a table variety is not marginal. Kufri Chipsona-1 sits at around 21% dry matter with reducing sugars of 60–75 mg/100 g. Kufri Jyoti, a fine table potato, runs 18–21% dry matter but 106–275 mg/100 g of reducing sugars — several times the chipping threshold at its upper end. The same fryer, the same settings, and one produces a saleable chip while the other produces a dark one. •



The seven stages, in order (page 27). Stock photos: Dptc India, Mark Stebnicki, Mateusz Feliksik, Polina Tankilevitch, Rabbit Visual, Ron Lach, Srattha Nualsate / Pexels; not one plant.

The line, station by station:

Seven stages, in order

01

Destone and wash

Stones and clods come in with the crop and destroy slicer blades. Washing also takes off field soil, which otherwise ends up in the fryer oil and darkens it.

02

Peel

Abrasive or steam peeling. Over-peeling is a silent yield loss: every extra percentage of skin removed is potato you bought and threw away.

03

Slice to thickness

The single most consequential setting on the line. Thickness decides frying time, oil pickup and texture, and a blunt blade tears the cell wall instead of cutting it.

04

Wash, then blanch

Slicing releases starch, which would glue slices together and burn. Blanching in hot water goes further: it leaches out some of the sugars that turn a chip dark.

05

De-water

Surface water flashes to steam, cools the oil and spits. A de-watering blower before the fryer is not optional at any serious volume.

06

Fry

Where the chip is actually made. Everything above is preparation; everything below is finishing.

07

De-oil, season, pack

A centrifuge or vibrating de-oiler pulls back surface oil before seasoning and nitrogen-flushed packing.

Versatile high-capacity
French fry cutter / potato dicer
featuring the SureCut Unit



Cutting machine featuring the unique concept of the SureCut unit (SCU). The SCU allows the cutting components to be preassembled in one piece and the cut size is preset. Installation of the cutting tools is fast, simple, and error-free, even for operators without technical training.

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Leader profile:

Ritika Bansode

The plant head who counts in kilograms

Ritika Bansode runs a mid-size snack plant in western Maharashtra. Her rule for every decision is the cost of a saleable kilogram. (A sample layout: the person and the company are invented.)

By the Food Processing World desk,
Sample layout

At seven every morning Ritika Bansode walks the line at Suvarna Snackworks before she opens her laptop. She starts at the potato intake and ends at the dispatch bay, and she carries a notebook rather than a phone. "If I read the report first, I see what the report wants me to see," she says. "If I walk first, I see what the line is doing."

Suvarna is the kind of company that makes most of the snacks India eats and almost none of the headlines: a family-owned business with two chips lines, a namkeen line and a small frozen tikki line, selling under its own name in three states and packing for two retail chains. Bansode joined as plant head in 2015 and became chief executive in 2022. She still keeps the plant head's desk.

From the quality lab

She trained as a food technologist and began in a quality laboratory, testing fry colour and moisture on a chips line. It taught her that the potato decides more than the fryer does. "The lab was where the arguments ended up," she says. "Purchase said the lot was fine, production said the lot was bad, and I had the sugar reading. After two years of that I knew I wanted to

fix the argument before it reached the lab."

That is what she did at Suvarna. The company had bought potatoes on the open market from whoever offered the best price in the week. She moved most of its supply to contracts with growers in two districts, with varieties agreed before planting and a sugar test at the gate. The first season was harder, she admits. Growers wanted a price before they wanted



Sample layout: stock photo of a model, standing in for a fictional person. Photo: RDNE Stock project / Pexels

“A new line looks good in a photograph. A saleable kilogram that costs less is better, and nobody photographs it.”

At a glance (fictional)

Name: Ritika Bansode (fictional)

Born: 1979, Nashik (fictional)

Education: B.Tech, food technology; MBA, operations

Career: QA chemist on a chips line; production manager; plant head, Suvarna Snackworks, 2015; chief executive, 2022

Company: Suvarna Snackworks Pvt Ltd (fictional), family-owned, founded 2009

Plant: Kesarwadi, Maharashtra (fictional): two chips lines, one namkeen line, one frozen tikki line

a variety, and the company had to learn to hold stock in a cold store at a temperature that suited chips rather than seed.

The saleable kilogram

Ask her about capacity and she changes the question. Suvarna's board once asked for a third chips line. She asked for a month instead, and spent it measuring the two lines it had: downtime by station, oil and gas by tonne, breakage at each transfer, and the share of every tonne of potatoes that left the plant in a pack. The answer was that the slicer and the de-oiler were holding the line back, not the fryer. The company replaced both and did not build the third line that year.

“A new line looks good in a photograph,” she says. “A saleable kilogram that costs less is better, and nobody photographs it.”

The same habit runs through her buying. Every machine maker who comes to Suvarna is asked for a speed and an accuracy tested on its own product, and for a plant she can visit. She keeps a list of the questions that matter most and gives it to every new engineer.

People on the floor

Bansode is proudest of the shift supervisors, most of whom started as operators. Each one owns a short list of numbers for the shift and explains them at the handover. The plant runs a short training session on the floor every week, on one topic only: a seal check, a metal detector test, how to read a fry-colour card.

“The people who run the line know where it hurts,” she says. “My job is to make sure someone asks them.”

What comes next

The frozen tikki line is her next project. It started as a way to use potatoes too small for chips, and it now sells to restaurants as well as shops. She is cautious about it. A frozen line needs a cold chain, and a cold chain needs buyers who pay on time. She would rather grow it slowly than fill a freezer with stock she cannot move.

She is also cautious about exports, though she reads the trade figures every month. “Everyone sees the tonnes,” she says. “I want to see the buyer, the payment terms and the specification first. Then I will see the tonnes.”

For now the morning walk continues, notebook in hand, intake to dispatch. Bansode says the line has changed more in ten years than she has. Her rule has not changed at all. •



Photo: Gonzalo Ruiz / Pexels

Cold storage:

How to load a potato cold store without bruising

Open a bag months from now and most of what is wrong with it was already inside on the day it went in. The damage does not happen in the store. It happens while you are filling it.

By the Indian Potato Team, First published on IndianPotato.com

A potato that goes in with a bruise or a broken skin does not heal in the cold. It rots. So the job on loading day is simple to say and hard to do: drop the crop as little as possible, get the field heat out, and keep the bad bags away from the good ones.

Why loading matters more than the rest of the season

A potato has one defence: its skin. While the skin is unbroken, the tuber can sit for months. Once it is cut, scuffed or bruised, rot has a door. Cold does not close that door. Cold only slows things down. A bruise you put into the crop while loading is still there when the bag comes out, and by then it has usually turned into something worse. This is why loading decides the season. You can run the store perfectly for the whole season and still open bad bags, because the damage was already inside them before the door closed. We lose about 7.34% of the potato crop at farm level — before it ever reaches a wholesaler or a shop. That is the national figure, and it does not include what goes wrong later in storage.

Your crop is in bags. That changes almost every rule.

Our crop goes into bags, and the bags are stacked in chambers, often over several floors. That one fact decides most of what follows, because of what it does to air. Air moves around a stack. It does not go through it. A fan can cool the room and it can carry heat away from the outside of a bag, but it cannot reach into the middle of one. So a bag that goes in wet stays wet, and a bag that goes in warm gives up its heat slowly, from the outside in. So the drying has to be finished before a bag ever reaches the stack. Whatever you did not do in the field or in the yard will not get done inside the chamber. Once that bag is in the middle of a stack, it is on its own until you take it out.

How fast should you fill the store?

Fill at 4% to 5% of your store's capacity a day. For a full store that comes to about 20 days, and that is the right speed for a bag stack. It is also what our national cold-store standard sets, so nobody can tell you that you are going too slowly.



Photo: EDRIS IBRAHEEM / Pexels

Read that last line again, because it is the whole point. The hotter the crop, the slower you must fill. Hot potatoes give off heat and moisture. Put too many in too fast and the machine cannot keep up. The crop sweats, the bags stay damp, and rot starts in the middle of the stack where you cannot see it.

Where Indian potatoes actually get bruised

Bruising is not one event. It is a total. Every drop adds a little, and the crop arrives at the store with the sum of all of them. How the crop was grown and dug matters



Photo: Mwesigwa Joel / Pexels

as well; that is why two identical-looking potato lots store differently. In a bag system, count the drops:

- Digging. Tubers hitting the harvester web, and hitting each other.
- Collection in the field. Tubers thrown into a basket or a heap.
- Filling the bag. The higher the pour, the harder the landing.
- Loading the truck. Bags thrown up rather than passed up.
- The journey. Bad roads, and bags pressing on the bags underneath.
- Unloading at the store. Bags dropped from the truck bed to the ground.
- Carrying and stacking. Especially the last bags on a high stack.
- The weight of the stack itself. The bottom bags carry everything above them for months.

Not all of these need money to fix. Several need only instruction. Lowering the pour height when filling a bag costs nothing at all, and it is one of the biggest single improvements available to most growers. •

Sample advert reproduced from Potato Processing International for layout demonstration.

We can talk all day about our high quality machines for storage and handling but...

... it's the result that counts



HANDLING



STORAGE

Storage technology:

After CIPC: can ethylene hold sprouts without darkening the fry?

Europe stopped using CIPC in its potato stores in 2019 and turned to ethylene. For chips and fries it is a trade-off: in many varieties the gas also raises the sugars that turn fries dark.

By the Indian Potato Team, Storage desk, First published on IndianPotato.com, 19 October 2026

For decades, stores holding potatoes for chips and fries relied on CIPC, a chemical fogged into the store to stop sprouts. The European Union did not renew its approval in June 2019, ordered products off the market by January 2020 and gave stores until October 2020 at the latest to use up stock. Residues in old stores have proved hard to clean out, so the EU now allows a temporary limit of 0.2 mg of CIPC per kg of potatoes.

That pushed European and British stores towards other tools. Ethylene was one of the cheapest to run: the gas is released into the store, usually from a generator, and kept at a low level for the whole season.

Sprouts down, sugars up

A potato is alive in store. Ethylene keeps the buds asleep, but it also makes the tuber breathe faster, and that can turn some of its starch into glucose and fructose, the reducing sugars. In the fryer those sugars react with amino acids, the browning reaction that also forms acrylamide. More sugar means a darker, often bitter chip or

fry, and a batch can be rejected on colour alone.

British storage advisers have said the risk is probably enough to rule ethylene out for crisping varieties. French fry plants have more room: they can blanch out some sugar before frying.

How the gas is started matters most. A nine-season Canadian study on fry potatoes, including Santana, a variety also grown for fries in India, found that starting early and raising the dose step by step did least harm to fry colour while still holding sprouts. Breaks in supply of 18 hours, or of two days or more, weakened sprout control. Kept on without a break, ethylene held sprouts as well as CIPC, except in stores at 13 °C.

The hidden partner: carbon dioxide

Stored potatoes give off carbon dioxide all season, typically 0.3–0.5% in a store and up to 3% when the crop is breathing hard. British trials show that carbon dioxide on its own did not change fry colour. With even a trace of ethylene in the air, from 0.25 ppm, it did: the more carbon dioxide, the darker the fries. A store using ethylene has to be



Photo: Polina Tankilevitch / Pexels (cut out)

flushed with fresh air often enough to keep carbon dioxide low, without letting the ethylene level swing.

Variety decides the result

In British box-store trials with ethylene at 10 ppm, Fontane, Markies, Ramos and Russet Burbank held sprouts with acceptable fry colour for six months; Maris Piper, Desiree and VR808 for about four; Lady Claire, Innovator and Saturna only for about two. India's main processing varieties, such as Kufri Chipsona-1, Kufri Chipsona-3 and Kufri Fryom, have no published ethylene storage trial that we could find.

What this means in India

India's pesticide register lists chlorpropham as the only sprout suppressant for stored potatoes: fogged at 18 to 20 g of active ingredient per tonne, in cold stores at 10 ± 2 °C and 90 ± 5% humidity, with a 20-day waiting period. The register lists no ethylene, spearmint oil or DMN product for potato storage. Exporters carry an extra check: India's residue limit for CIPC on potatoes is 30 mg per kg, while

the EU's temporary limit is 0.2 mg per kg.

A checklist for the store manager

- Know your variety. Fry a test batch from each lot before storage and every month after, and keep the records.
- Use only registered products, and follow the label.
- Hold processing stock warm enough. Indian research points to about 10 to 12 °C for chip varieties, not the 2 to 4 °C used for seed potatoes.
- Measure carbon dioxide, and keep engines and exhaust out of processing chambers.
- If potatoes must be held cold, warm them before processing and fry-test until the colour is acceptable. •



Photo: Sergei Starostin / Pexels

Your options compared

Option	How it works	Fry colour	On India's register
Ethylene, kept on	Gas held low all season, started gradually	Can darken, by variety	Not listed
Ethylene with 1-MCP	1-MCP blocks the tuber's response first	Prevented sweetening in some trials	1-MCP listed for apples only
Spearment oil	Hot-fogged oil burns back sprouts	No decline reported in trials	Not listed
DMN	Compound found in tubers, fogged	Did not affect fry colour in trials	Not listed
CIPC (chlorpropham)	Fogged chemical suppressant	Held sugars low in Indian trials at about 10 °C	Listed
Temperature only	Cold stops sprouts; sugars rise	Dark if stored too cold	No product needed

Source: Indian Potato Team, IndianPotato.com, 19 October 2026: AHDB trials, Potato Research, EU Regulation 2019/989, India's CIB&RC register.

In numbers:

Three numbers on India's processed potato trade

4×

growth in India's flakes exports, 2019 to 2024

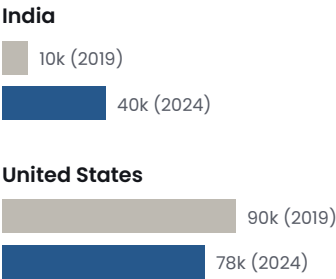
₹18.86

a kilo for India's fresh potato at the border, 2025

49

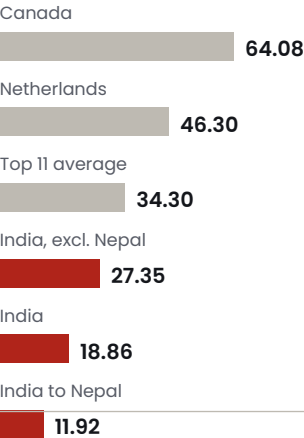
countries bought Indian potato starch in 2023

Potato flakes exports, tonnes, 2019 and 2024 (roughly)



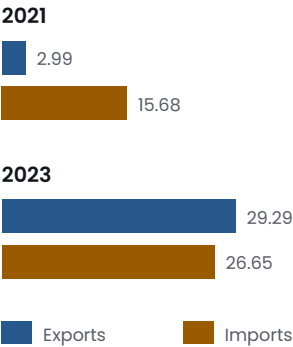
India shipped roughly 40,000 tonnes of potato flakes in 2024, against roughly 10,000 in 2019: fifth place in the world. American exports fell from about 90,000 to about 78,000 tonnes over the same years. World flakes trade grew by 123,000 tonnes, and India supplied close to a quarter of that growth. Flakes travel as a dry good, so India could build this trade without the cold chain frozen fries need.

Fresh potato export price, 2025, ₹ a kilo



India's exported fresh potato fetched ₹18.86 a kilo at the border in 2025. Only Pakistan sold cheaper. Nepal took 55% of India's tonnes, at ₹11.92 a kilo; without Nepal, India's price was ₹27.35. Volume fell from 506,000 tonnes in 2024 to 417,000 in 2025.

Potato starch trade, ₹ crore



In 2021 India imported more than five times as much potato starch as it exported. By 2023 exports had edged ahead, ₹29.29 crore against ₹26.65 crore of imports, and went to 49 countries.

Sources: IndianPotato.com: flakes, 28 August 2026; export price, 25 September 2026 (HS 0701, FOB); starch, 12 July 2026, from World Bank WITS data. Photo: thor15 / Pexels



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Sample advert reproduced from Potato Processing International for layout demonstration.



Photo: Anna Shvets / Pexels



Photo: Abhijeet More / Pexels

Food science:

What the evidence says about five food processes

On 1 October 2026 the food processing ministry and NIFTEM-Kundli ran an advertisement setting traditional and industrial processing side by side. We checked each claim against the evidence.

By the Food Processing World desk, From foodprocessingworld.com

1 Milling

Milling makes grain more versatile and easier to cook with. The ministry's own FAQ also says refining can remove the bran, which is rich in fibre, B vitamins and minerals. A 2023 study in *Nutrients* found zinc, iron, fibre and protein highest in the bran fractions of wheat and lowest in refined flour. The degree of refining decides how much reaches the plate.

2 Pasteurisation

The US FDA states that pasteurisation effectively kills raw milk pathogens without any significant impact on milk's nutritional quality. FSSAI's Schedule 4 requires pasteurised milk to be cooled immediately to 4 °C or lower and stored at no more than 5 °C until it leaves the plant.

3 Heating and drying

In a 1997 human study, tomato paste gave a 2.5-fold higher peak of lycopene in the blood than the same dose from fresh tomatoes. A 2002 study found antioxidant activity rose with heating time, while

vitamin C fell by about 29% after 30 minutes. Heat helps some nutrients and costs others.

4 Fermentation

Taste, texture and keeping quality are long established. The gut-health claim needs care: a 2021 consensus statement says fermented foods and probiotics cannot be used interchangeably, because many fermented foods hold no live microbes by the time they are eaten.

5 Freezing

A 2015 study found the vitamin content of frozen produce comparable to, and occasionally higher than, fresh produce kept in a refrigerator, with one exception: beta-carotene dropped sharply in some frozen vegetables. Blanching before freezing costs some vitamin C and B vitamins.

For the plant

Each line of the advertisement rests on a step a plant has to control and record: validated heat steps, calibrated sensors, cold-chain logs and a specification for the degree of refining. •

Opinion:

Where India's potatoes go

India grows about 586 lakh tonnes of potatoes a year. Most of them end up in the kitchen as a vegetable. A growing share now goes to chips, fries and flakes factories.

By Devendra K Jha, First published on IndianPotato.com, 20 October 2026



Devendra K Jha
Opinion



Raw material is the constraint, not demand.

Potato is India's most-grown vegetable. The 2024-25 crop came to 585.71 lakh tonnes, or about 58.6 million tonnes.

Out of every 100 potatoes India grows

About 70 are eaten fresh as a vegetable, about 10 are processed into chips, fries, flakes and other products, 7-8 are kept as seed, and about 1 is exported. A few more are lost after harvest.

Seven potatoes in ten are bought fresh and cooked: aloo sabzi, dum aloo, parathas, samosas, vada pav, tikki. Most of this trade runs through mandis and cold stores and is sold loose. Some potatoes never reach any of these uses. On the farm, during digging, grading, packing, transport and storage, about 5 in every 100 are lost. About 1 more is lost at the wholesale and retail stage.

7-8% is kept back to plant the next crop. Planting every field with fresh seed at the recommended rate would take more, about 6.7 million tonnes a year. India sold 4.22 lakh tonnes of fresh potatoes abroad in 2025-26, mostly to Nepal. Counting fries and flakes as well, exports take about one potato in a hundred.

How fast processing is growing

In the late 1990s, almost no Indian potatoes went to processing: under 1% of the crop. Chips factories were few, and they made do with table varieties that were not bred for frying. Today about 10% of the crop is processed.

In 2023 Indian factories and kitchens processed 6.0 million tonnes of potatoes, double the 3.0 million tonnes of 2014. Organised factories alone grew from about 1.25 lakh tonnes in 2003 to about 18 lakh tonnes in 2018-19. In 2018-19 they handled about 40% of the potatoes processed in India; the other 60% went through small units and home-scale processing.

Chips built India's processing industry. Frozen French fries are now growing fastest. India made about 35,000 tonnes of fries and other frozen potato products in 2014, mostly for Indian restaurants. By 2023 that had grown to about 3 lakh tonnes, and much of it now goes abroad.

Why only one potato in ten

Most Indian potatoes are grown to be cooked at home, not fried in a factory. A processor cannot take just any potato. It needs:

- Enough dry matter. Above 20% dry matter, so that chips come out crisp and fries are not soggy

and do not drink oil. Most table varieties fall short.

- Low sugar. Reducing sugars below 100 mg per 100 g of fresh potato. Above that, chips and fries turn brown or bitter in the fryer.
- A buyer fixed before planting. Processors arrange most of their supply through contracts with farmers, often supplying seed and advice.
- Supply all year. A factory runs every month, but potatoes are harvested only a few months a year. A fully mature processing crop can be stored for 8-9 months and buyers also spread their buying across regions with different harvest times.

What this means for cold stores and processors

Factories need potatoes all year. Stores that can hold processing potatoes at the right temperature without sugar build-up have a steady customer.

Raw material is the constraint, not demand. Buying from more than one belt and contracting early is how factories keep running through the year.

Devendra K Jha is a Potato Intelligence Expert and co-founder of IndianPotato.com and indianpotato.in, and writes on India's potato economy. Source: Indian Potato Intelligence. 2024-25 crop: final estimate for that year. •



Show report:

Anuga FoodTec India at 20

The 20th edition of India's biggest food-technology fair filled four halls of the Bombay Exhibition Centre from 29 September to 1 October 2026. What was on the floor, what was said, and when it returns.

By the Food Processing World desk



Anuga FoodTec India ran from 29 September to 1 October 2026 at the Bombay Exhibition Centre in Goregaon East, Mumbai, organised by Koelnmesse. It shared the site with the 19th edition of Anuga Select India, a show for finished food and beverage products, under the logo “20 Years: Trust, Technology, Transformation”. In a release dated 18 September, the organiser said the two shows together would bring more than 1,100 exhibitors from over 32 countries and an expected 45,000-plus trade visitors. These are the

organiser’s own figures, published before the doors opened. It named the European Union as Official Partner Region at Anuga Select India and said the edition was supported by the Ministry of Food Processing Industries.

Four halls, one line

The hall plan followed a factory. Halls 2 and 3 held processing and automation; Halls 4 and 5 held packaging and intralogistics; Hall 6 was Anuga Select. Our reading of the printed exhibitor lists found 657 FoodTec entries: 147 in Hall 2, 243 in Hall 3, 166 in Hall 4 and 101 in Hall 5.

Continued on page 40



Continued from page 39

By names alone, roughly half were processing companies and more than a quarter packaging. Italy and China ran country pavilions.

What the conference asked

Three days of panels, with Bluetech Media as conference partner, covered the smart factory, waste to value, food safety beyond

compliance, packaging by design, dairy, the supply chain, future ingredients, beverages, smart packaging and smart snacking. Speakers came from Mondelez, Mars, BRCGS, Rockwell Automation, Mitsubishi Electric, Buhler, Forbes Marshall, Parag Milk Foods, Marico and Diageo India, among others.

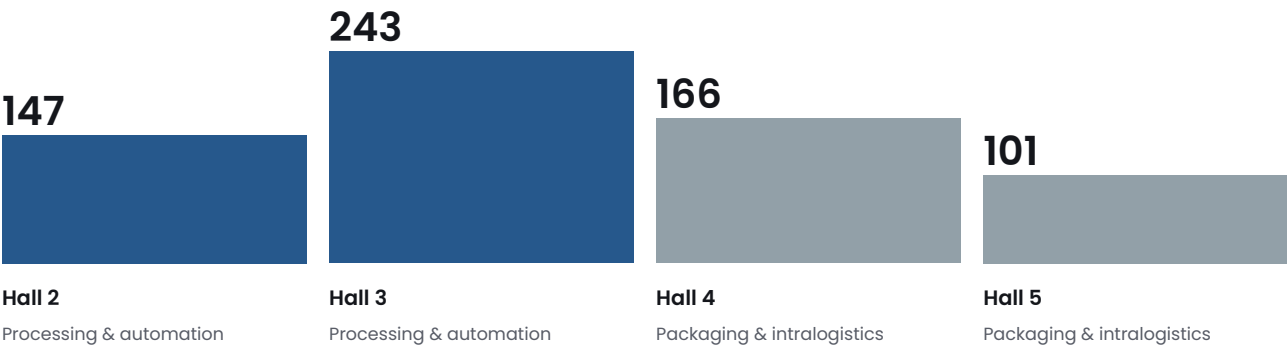
What to take home

If you went to compare packaging and inspection lines, ask every maker for a speed and accuracy tested on your own product. Our guides on pages 22 and 24 list the questions. •



Stock photo, not taken at the show. Photo: Denys Novikov / Pexels

Exhibitor lines in the show guide, by hall



The conference, in eleven sessions

Day	Session
29 Sep	Trust Through Technology: India's future food manufacturing ecosystem
29 Sep	The Smart Factory: AI, robotics and autonomous food manufacturing
29 Sep	From Waste to Value: sustainable factory design
29 Sep	Food Safety 4.0: beyond compliance
29 Sep	Packaging by Design: packs that protect, perform and persuade
30 Sep	Dairy 4.0: smart and sustainable dairy manufacturing
30 Sep	Reimagining India's food supply chain
30 Sep	Future Ingredients: functional ingredients and nutrition
30 Sep	Smart Packaging: sustainable, intelligent and connected
30 Sep	Future-Ready Food Manufacturing: roadmap to 2035
1 Oct	Smart Snacking: processing for consistent quality

Next editions: 28–30 Apr 2027: Anuga FoodTec India Dairy, Bharat Mandapam, New Delhi · 26–28 Nov 2027: Anuga FoodTec India + Anuga Select India, Bombay Exhibition Centre, Mumbai. Source: Anuga FoodTec India 2026 show guide.

ADVERTORIAL

Advertorial. Published in partnership with Fry and Bake Technologies Pvt. Ltd; first published on IndianPotato.com as a sponsored Industry Spotlight, 30 September 2026. Company details, machine count and markets are the company's own.

Industry spotlight:

Fry & Bake at Anuga FoodTec India 2026

Anuga FoodTec India turns 20 this year, and in Hall 3 the flame belongs to Ahmedabad's Fry & Bake Technologies, the award-winning maker of complete potato and snack processing lines.



Stock photo, not the advertiser's line. Photo: Ron Lach / Pexels

250+

machines installed around the world

2012

the year Fry & Bake was founded in Ahmedabad

6

markets: India, Russia, the UAE, Africa, Europe and the USA

Walk into Hall 3 at the Bombay Exhibition Centre this week and it is hard to miss the flame. Fry & Bake's stand at Booth G99 is laid out like a working plant, with a complete processing line on every wall, and its tables were full of visitors from the opening morning. The company has come to Anuga FoodTec India 2026, the 20th edition of South Asia's food and beverage technology fair, with its whole range: lines for potato chips, frozen French fries, potato flakes, namkeen and fryums, right up to complete turnkey plants. The organisers welcomed Fry & Bake to the show by name before it opened, as a builder of turnkey lines for Indian and global food manufacturers. The company is led by its Managing Director and Founder, Krishna Pandit.

A complete line for every snack

- Potato chips lines. Fully automatic lines that peel, slice, wash, fry and season in one continuous flow.

- Frozen French fries lines. Continuous lines for cutting, blanching, frying and freezing fries to export quality.
- Potato flakes lines. Automatic flake lines with blanching and drum drying, built in-house in food-grade stainless steel.
- Namkeen and Kurkure lines. Automatic namkeen fryers, sev and boondi extruders, bhujia breakers and Kurkure frying lines.
- Fryums and extruded snacks. Frying lines for 2D and 3D pellet snacks, from fryer to seasoning.
- Complete turnkey plants. Design, manufacture, installation and support, from the first machine to the last.

In his own words

"Every machine tells a story."
"Success in manufacturing isn't measured by how many machines you build. It's measured by how many businesses grow because of the solutions you create. ... My goal is not just to build machines. It is to build trust, long-term partnerships, and solutions that help our customers grow their businesses."

Fry and Bake Technologies started in Ahmedabad in 2012, and Krishna Pandit puts its aim simply: machinery "that manufacturers could rely on for years, not just until the warranty expired". "The best is yet to come."

A year of milestones

- 2012. Fry & Bake is founded in Ahmedabad.
- January 2026. Wins Continuous Snacks Production Line of the Year at Indusfood Manufacturing 2026, Yashobhoomi, New Delhi.
- 2026. Starts building a new manufacturing campus, now under construction, with dedicated space for R&D and application development.
- 16-17 December 2026. A triple stall, E-1-2-3, at the Global Potato Summit 2026, Mahatma Mandir, Gandhinagar.

Whether you are adding capacity or building your first plant, the Fry & Bake team will walk you through the line that fits your product, your volume and your budget. •

"Every project teaches us something new. Every customer challenge pushes us to innovate. Every successful installation reminds us that engineering is ultimately about creating value for people." Krishna Pandit, Managing Director & Founder, Fry & Bake Technologies. sales@fryandbake.com · fryandbake.com · Ahmedabad, Gujarat

Buyers' guide:

Thirteen suppliers, and five questions to ask them

Each entry is from the maker's own website or literature, read October 2026. Capacities are the makers' figures. A listing is not an endorsement.

Ishida

Japan · Founded 1948 (business from 1893), Kyoto
Multihead weighers, bagmakers, checkweighers, inspection
ishida.com

Nichrome

India · Pune; first milk packaging machine 1977
Integrated packaging systems; 11,000+ installations
nichrome.com

Pakona Engineers

India · Founded 1982; Vadodara plant 1984
Vertical and horizontal FFS, cartoners
pakona.com

Pace Packaging

India · Founded 2002, Ahmedabad
Vertical form-fill-seal machines
pacepackaging.in

Sanko Machinery

Japan · Established 1970
Stick packers, weight checkers, auger fillers
sanko-kikai.co.jp

WIPOTEC

Germany · Kaiserslautern; 1,300+ employees
Checkweighers, X-ray, track and trace
wipotec.com

Minebea Intec

Germany · Part of MinebeaMitsumi; Aachen
Industrial weighing and inspection
minebea-intec.com

LOMA SYSTEMS

UK · Established 1969; part of ITW
Metal detectors, checkweighers, X-ray
loma.com

Fry and Bake Technologies

India · Founded 2012, Ahmedabad
Chips, fries, flakes, namkeen and pellet-snack lines; turnkey plants
fryandbake.com

Vimson India Engineers

India · Since 1996; MIDC Bhosari, Pune
Starch recovery, peeler water reuse, destoners, seasoning kettles, dryers, conveyors
vimson.com

First Technodrives

India · Perumbavoor, Kerala; India representative of Sensitar
Fries lines up to 10 t/h, flakes up to 2 t/h, chips up to 1 t/h (as printed)
firsttechnodrives.com

ULMA Packaging

Spain · ULMA Group, Oñati; India office in Thane
Flow-pack and vertical wrappers, thermoformers, tray sealers, stretch and shrink wrapping
ulmapackaging.com

Shandong Meiying Food Equipment

China · Founded 1996; Zhangqiu, Jinan
Dough mixers, vegetable slicers and peelers, meat machines, proofers and ovens
sdmyfoodequipment.com

Before you sign:

Five questions for every maker

- 1 What speed and accuracy will you guarantee on my product, my film and my pack size? Show me the test.
- 2 Which change parts does my list of pack sizes need, and how long is a changeover?
- 3 How is the machine cleaned, how often, and can product-zone parts come off without tools?
- 4 Who services it in my state, and how fast can a spare reach my plant?
- 5 Which plant running the same product can I visit?

Get listed:

Put your machines where plant buyers compare

Every listing is checked against the maker's own datasheets. Buyers ask for brochures and quotes from several makers in one place, online and in print. House advertisement, sample.

Your logo

Your company here

Country · founded · plant

A buyers' guide listing: logo, 80 words, what you make and how to reach you, in print and on foodprocessingworld.com. This is a sample slot.



Hash browns



Wedges



Aloo tikki



Fries



Chips

Photos: Evan Mahmud Shuvo, Horizon Content, J KREATOR, Polina Tankilevitch, Terrance Barksdale / Pexels (cut out)

Product development:

Beyond fries: what else a frozen potato line can make

Hash browns, aloo tikki, wedges, shaped snacks and samosas are real categories on Indian lines. The customs data cannot tell them apart. The equipment can.

By the Indian Potato Team, First published on IndianPotato.com, 11 July 2026

India reports every frozen prepared potato product under one customs code, HS 200410: fries, hash browns, tikki, wedges, snacks and samosas together. That code grew from \$49.3 million and about 59,150 tonnes of exports in 2021 to \$157.6 million and about 116,080 tonnes in 2023, according to World Bank WITS data. Figures that size the Indian hash-brown or tikki market on their own are private estimates, not customs data. For a processor, the case for a second product is a hedge. A plant running only fries is exposed to one product's price cycle and one set of buyers.

Hash browns

Shredded or diced potato, blanched, formed into a patty or

loose shred pack and frozen, without the par-frying step that defines a fry. The real addition to a fry line is the shredding-and-forming stage; the blanching, freezing and packing backbone overlaps.

Aloo tikki and cutlets

A category India built for its own market and now exports: mashed potato mixed with spices and often peas, onion or paneer, formed into a patty and par-fried, steam-set or breaded before freezing.

Wedges

A skin-on, irregular cut, usually seasoned before freezing. The cutting head is different from the first stage, and a coating step is added.

Shaped snacks

Nuggets, smiles and croquettes are formed in a mould, extruder or cutter, then breaded or battered and par-fried: two stages a plain fry line does not have.

Samosas

Furthest from a fry line: a wheat-flour pastry folded around a potato filling needs dough sheeting, filling and folding equipment that shares almost nothing with a potato cutting line.

What stays the same

An FSSAI licence is required for any of them. The freezing infrastructure funded under the ministry's cold chain scheme serves every shape the potato comes out in. •

Questions from the plant floor

Short answers, each from a source in this issue. Send yours through foodprocessingworld.com.



Photo: Manoz Gowda / Pexels

Is pasteurised milk less nutritious than raw milk?

The US FDA says pasteurisation has no significant impact on milk's nutritional quality while killing the pathogens raw milk can carry.

How fast should I fill a potato cold store?

At 4% to 5% of the store's capacity a day, about 20 days for a full store. The hotter the crop, the slower you must fill.

Does ethylene stop potatoes sprouting in store?

Yes, kept at about 4 to 10 ppm without breaks for the whole season. In Canadian trials it worked as well as CIPC, except in stores at 13 °C.

Why does a checkweigher's accuracy fall at speed?

The faster a pack crosses the weigh belt, the fewer readings the machine can take. Ask for accuracy tested on your pack, at your speed.

Can a metal detector inspect product in foil?

Not a standard balanced-coil detector. Inspect before packing, or use a ferrous-in-foil detector or X-ray.

Why are some chips greasy?

Usually because they were fried too cold. The water leaves slowly, the surface never seals, and oil moves in to fill the space the water left.

Vertical or horizontal form-fill-seal?

Loose product into a pillow or gusseted bag: start with vertical. Stand-up pouches with zippers or caps, liquids, or products that must be placed rather than dropped: look at horizontal as well.

Why are snacks nitrogen-flushed?

Nitrogen displaces oxygen in the pack and slows the rancidity of fried snacks and nuts. It also cushions the product. Ask how residual oxygen is measured.

Is CIPC allowed in India?

Yes. Chlorpropham is the only sprout suppressant on India's register for stored potatoes, with a residue limit of 30 mg per kg.

What does the PMFME scheme pay a potato processor?

35% of the project cost, up to ₹10 lakh, for a single small unit; 35%, up to ₹3 crore, for shared facilities built by FPOs, SHGs and cooperatives in districts where potato is the ODOP.

How much of India's potato crop is processed?

About 10%, up from under 1% in the late 1990s. In 2023 about 6.0 million tonnes were processed, double the 3.0 million tonnes of 2014.

What are empty kilometres?

The distance a truck covers with no load, usually the return leg. A truck that runs 300 km loaded and 300 km back empty has moved 600 km to do 300 km of work. •



Photo: Luis Quintero / Pexels

Events: Shows to plan for, to April 2027

Dates	Show	Where	For
16–18 Nov	interpack Processing & Packaging China	Shanghai, China	Processing and packaging machinery
17–19 Nov	Fi Europe	Frankfurt, Germany	Food ingredients
18–19 Nov	British Potato Industry Confex	Lincoln, UK	Potato industry, first edition
26–27 Nov	India Potato Summit	Lucknow, India	Potato value chain
29 Nov – 1 Dec	INTERPOM	Kortrijk, Belgium	Potato storage, grading, processing
7–10 Dec	Food Africa	Cairo, Egypt	Food, processing, packaging
16–17 Dec	Global Potato Summit	Gandhinagar, India	Potato value chain
5–7 Jan	Potato Expo 2027	Denver, USA	North American potato industry
6–8 Jan	Indusfood Manufacturing	New Delhi, India	Food-processing technology
31 Jan – 3 Feb	ISM	Cologne, Germany	Snacks, sweets, ingredients
23–26 Feb	Anuga FoodTec	Cologne, Germany	Processing, packaging, food safety
24–26 Feb	ProPak Philippines	Manila, Philippines	Processing and packaging
2–4 Mar	Propak East Africa	Nairobi, Kenya	Packaging and processing
2–6 Mar	AAHAR	New Delhi, India	Food, processing, hospitality
3–6 Mar	Sino-Pack	Guangzhou, China	Packaging machinery
9–12 Mar	FOODEX JAPAN	Tokyo, Japan	Food and beverage
15–19 Mar	Gulfood	Dubai, UAE	Food and beverage
28–30 Apr	Anuga FoodTec India Dairy	New Delhi, India	Dairy technology

Dates from the organisers, as listed in our show calendar (October 2026). AAHAR's dates were not yet confirmed by the organiser.

Feature planning 2027

Six issues, and where each one goes

Issue 03, January–February 2027

- Optical sorting for fry yield
- Pulsed electric field (PEF) for fries, explained
- Show preview: Anuga FoodTec, Cologne

Bonus distribution: Indusfood Manufacturing 2027, New Delhi, 6–8 January
Bonus distribution: Anuga FoodTec 2027, Cologne, 23–26 February

Issue 04, March–April 2027

- Testing fries for moisture and fat in minutes
- Cutting machines for fries, dices and specialty cuts
- Trade data: frozen potato exports to the Gulf

Bonus distribution: Gulfood 2027, Dubai, 15–19 March

Issue 05, May–June 2027

- Inspection on potato lines
- Screw blanchers: where breakage happens
- Storage technology: sprout control after CIPC

Issue 06, July–August 2027

- Flakes and granules
- Upgrading a fry line without replacing it
- Food safety: checkweighers and metal detectors

Issue 07, September–October 2027

- Automated potato packing plants
- Machine focus: form-fill-seal
- Buyers' guide: packaging and end of line

Issue 08, November–December 2027

- Ultra-low-volume treatment on conveyors
- Beyond fries: new frozen potato products
- Trade data: the year in exports

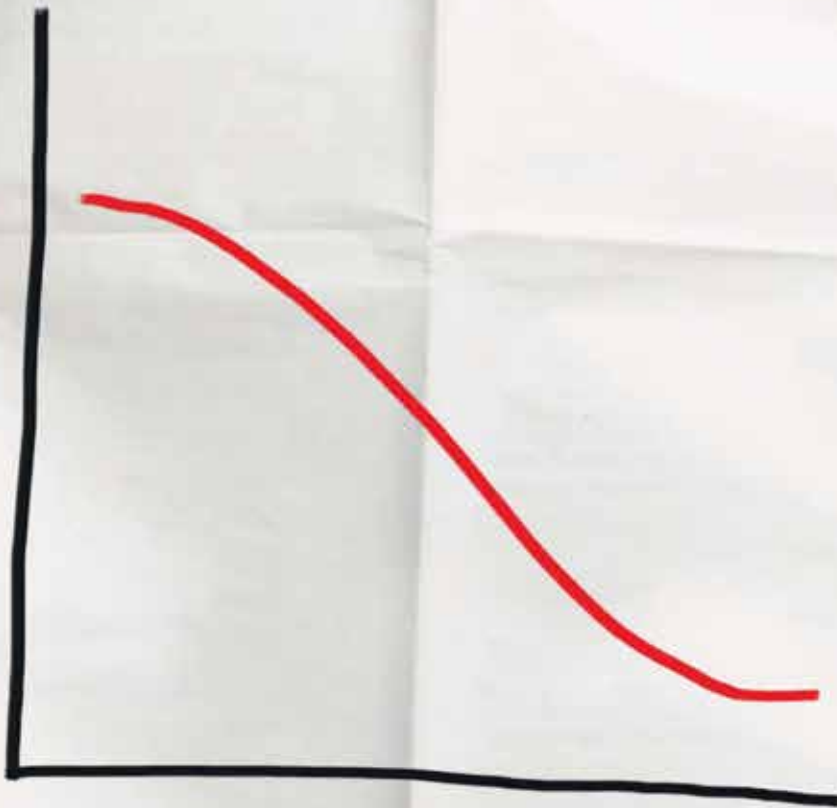
Booking and copy dates: on request. Shows are listed only where the organiser has confirmed the dates.

Put your machine in front of the people who buy lines

	Full page Bleed or trim size, facing editorial		Half page, horizontal Across the foot of a story page		Half page, vertical Beside a story on its own subject		Junior page Two columns by half the page, inside a story
	Third page, vertical One column, full height		Strip Across the foot of a news or data page		Inside front cover Opposite the contents		Outside back cover The last page of the issue

Rates, sizes and dates: foodprocessingworld.com/advertise Read every issue free: the digital edition is at foodprocessingworld.com.

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