



Voices of Innovation

 **Tetra Pak®**
PROTECTS WHAT'S GOOD

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“There is no better time to be working as a journalist in the Food & Beverage industry than right now. We are starting to see a massive shift in gender equality but things were a lot different when I started my career 25 years ago. When we were going through the dot com technology crash in 2000 and global financial crisis of 2007-2008 women entrepreneurs were the exception not the norm. These significant events in the world economy altered the status of women in the workforce and the percentage of female entrepreneurs has increased in the last 20 years and now, I interview more female leaders than ever before.”



Jenny Eagle,
Food & Beverage Industry Journalist

Female voices in innovation are driving the change we need

Here at Tetra Pak, we have more women leading innovative projects in Development and Engineering than we do men. But this is not the case throughout the industry, where Science, Technology, Engineering and Maths (STEM) are still seen as a predominantly 'male' subjects. We recognise that more diversity leads to new ideas, fresh perspectives and better innovation. The women at Tetra Pak are shaping our future, working across a diverse range of innovative fields to improve access to safe food and drive sustainability throughout the value chain.

Following on from the first chapter of our Voices of Innovation campaign, in which we spoke to colleagues and partners innovating to address sustainability challenges in packaging, we're now celebrating women working at the forefront of food science and technology. Through the voices of 13 women from all over the world, at various stages in their career and working in a multitude of different roles from varying academic backgrounds, they will explain how they're using innovation to create a responsible, accessible and sustainable food supply chain.

There are three main areas which are critical to future-proofing the food and beverage (F&B) industry: food safety, availability and sustainability. Each of

these women plays a vital role in at least one of these areas. Whether it's making a ground-breaking discovery in the filtration of milk proteins or digitising food packaging to better connect consumers and brands, they are coming up with new solutions to tackle industry-wide problems every day.

Our recent research study, the Tetra Pak Index¹, revealed that more than 50% of consumers believe that improving food safety is the number-one issue that companies need to tackle now and in the future. The pandemic has reaffirmed the importance of food protection – to keep consumers safe, as well as to support the continuous delivery of food supplies during these most difficult of times. These women have worked tirelessly over the past year and will continue to help food manufacturers innovate and scale to meet many of the demands being placed on them, whilst retaining the utmost level of food safety.

But it's not just about changing consumer demands – the global population itself is changing. According to the UN, by 2050 the global population is predicted to reach 9.7 billion people and the FAO says food production will need to be increased by 70% to accommodate this². Innovation will be key in helping us increase food production to feed these extra mouths. And it's not

just about innovating in the factory to ramp up production. Many of our female technologists are also looking into areas such as alternative protein sources to ensure we can deliver safe and nutritious food to everyone on a global scale.

Despite these increasing demands, we understand our responsibility as a major player in the F&B industry to create sustainable operations. The global food supply chain represents more than a quarter of greenhouse gas emissions³. That's why one of our main areas of focus for innovation is centred around sustainability, from lowering usage and wastage of resources during the manufacturing process to designing recyclable packaging that contributes to a circular economy. Sustainability is woven into every role within Tetra Pak, and nowhere is this more pronounced than in innovation. When asked, some of these women said it's our environmental commitment that attracted them to the company in the first place, and it's our ongoing work to support the sustainable future of our planet that gets them up every morning.

The world is going to look very different in 20 or 30 years' time. Consumer behaviours and F&B trends are constantly evolving, and climate change is already having a major impact on food safety and availability. That's why we want to give a platform to our Voices of Innovation – who are not only helping provide safe access to food for all, but also helping shape the future of our planet for generations to come.



Laurence Mott,
Executive VP & Development
and Engineering, Tetra Pak

¹ <https://www.tetrapak.com/en-gb/insights/tetra-pak-index>

² <http://www.fao.org/news/story/en/item/35571/icode/>

³ <https://science.sciencemag.org/content/360/6392/987>





Food Safety Innovation

The global landscape for food safety is changing all the time, the consumer wants more transparency in terms of what's going into their food. Is it organic, GM free or plant-based, how is it labelled, what's the 'Farm to Fork' journey, with endless reports on food waste and eco-friendly packaging. For the manufacturer, there are three pillars of concern: Food Safety, Nutrition and Food Security. Despite best efforts, food can potentially become contaminated at any point during production and distribution and unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes an estimated 600 million (almost one in 10 people) to fall ill, with approximately 420 000 deaths a year⁴.

The recent research study Tetra Pak Index⁵ highlighted the significance of food safety issues for our society. More than 50% of consumers not only believe that improving food safety is the responsibility of manufacturers, but they also see it as the number one issue that companies need to tackle now, and in the future. Concern for the environment remained high, alongside the threat of COVID-19, and the question we need to ask now is how can we best overcome these challenges together?

Looking ahead, the European Commission adopted Commission Regulation (EU) 2021/382, amending an existing food safety regulation on the hygiene of foodstuffs this year driving safe practices with regards to food allergen management, redistribution of food and food safety culture. In addition, International Food Safety Authorities Network (INFOSAN) is organising virtual food safety emergency response plan workshops in Africa in association with the Food and Agriculture Organisation (FAO) of the United Nations (UN).

The biggest challenge by far is that the UN predicts there will be 9.8 billion people on Earth by 2050⁶, which means the overall demand for food will increase by 50% and animal-based foods by nearly 70%⁷. This means that without a skilled workforce making strides in technology and using science-based analysis to secure our food systems, the next generation face an uncertain future.

At Tetra Pak, our brand promise has remained consistent: 'PROTECTS WHAT'S GOOD'. The foundation of our packaging is centred around food protection; to create a product in the most efficient way and maximise its availability to populations around the globe.

⁴ <https://www.who.int/activities/estimating-the-burden-of-foodborne-diseases>, ⁵ <https://www.tetrapak.com/en-gb/insights/tetra-pak-index>, ⁶ <https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>, ⁷ <https://research.wri.org/wrr-food/executive-summary-synthesis>

Anitha Rasmussen, Senior Filtration Technologist



Throughout my career, I have always had a very clear sense of direction. I studied Dairy Science and Technology at university, before going straight on to join Arla Foods and eventually Tetra Pak. As a Senior Application Technologist, I'm responsible for testing new products and finding ways to improve and expand the current limits of filtration equipment for our customers. It's a role with innovation at its core.

I recently finished a two-year research project with a colleague on the fractionation of milk into casein and whey proteins. This normally happens during cheesemaking, but filtration is advantageous as the process allows us to keep the proteins intact. They can then be used in a range of products, from infant formula to protein drinks, desserts, and flour mixes for bakeries.

This was a landmark project within Tetra Pak, and has given us a huge amount of knowledge, which is commercially valuable to the business and our customers.

One of the reasons I love working in innovation is the opportunity it affords to drive progress towards a more sustainable future. Historically, whey would have been thrown away or fed to animals, now it's probably the most popular protein powder in the world. I anticipate a future where we will transform other 'waste' products into high quality, nutrition rich food-products – and look forward to the role I will play in it.





Abigail Dagadu, Food Science Lead



As Tetra Pak America's Center of Expertise Food Scientist, my main focus is ensuring food safety is maintained across the value chain, while researching new ways to improve the taste or nutritional value of products.

My favourite thing about working in innovation and technology is being able to use my creativity to develop and improve existing products. Take some of the key challenges facing food scientists today: food insecurity, famine, skyrocketing costs and metabolic diseases, like obesity and diabetes. Despite the complexity and scale of these challenges, we've worked with our customers, to formulate products that are healthier, tastier, safer, more sustainable and conveniently available everywhere.

Day-to-day, I help customers select the right ingredients through rigorous supplier vetting processes, to ensure they are meeting requirements for both local and international food regulations while keeping costs low and the taste consistent. I also help to improve food texture, flavour, colour, chemical composition and nutritional value – all through the lens of improving food safety, availability and driving a more sustainable food supply chain.

This is where innovation comes in. I help introduce our customers to cutting edge technology and systems that address current and future needs, both for consumers and the planet as a whole. Looking ahead, I'm excited for the industry to move away from traditional processes and commit to viewing the science of food as a more holistic, interwoven system.

Lexie Li, Food Technologist



Greater China

After completing my Master's degree in Food Science and Technology, I won a place on Tetra Pak's Future Talent program. Since then, I've gained experience across multiple teams that make up the Tetra Pak family. This includes spending time in the Shanghai Product Development Center, on the Pre-Project team, and with Marketing Services. Despite the different groups, there have been a few constants, which I now understand are part of the Tetra Pak fabric, namely: strong communication, teamwork, purpose and innovation.

Perhaps the most innovative and exciting project I've worked on was one to deliver high protein milk. This directly responded to consumer demand in the Chinese market, where a protein-rich diet is seen as a symbol of good health. To deliver this, we needed to find the right balance in the sterilisation process, which called for plenty of desk research and lab experiments, as well as collaboration with Tetra Pak experts in Sweden. In this instance, we identified

the impact of a specific enzyme within milk and discovered that milk with higher protein content is more unstable during shelf life.

Another key learning for me has been the importance of Tetra Pak's mission to "protect what's good". This makes sustainability a foundational principle of each project. One area we've been focusing on is the recovery of water from food processing and reusing it through cooling equipment or in plant cleaning. This ties directly into our customers' main concern – cost. If we can help them recover water and reduce electricity use, it will help cut overall operational costs and in the long run, lower their carbon footprint.





Sridevi Marisetty, Digital Solutions Engineer



At Tetra Pak, I deploy digital solutions which enable our customers to connect with their suppliers and consumers – and provide all parties a more holistic view of the product life cycle. It's a role which places me at the forefront of innovation in the business and connects me with the brand promise – to protect what's good.

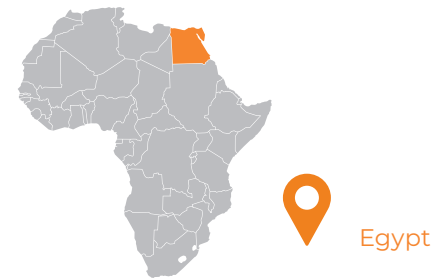
A key part of my role is leading Tetra Pak's connected packaging solutions. In essence, this involves adding a digital layer to packaging, enabling it to fulfil an additional function. While specifics will depend on the customer, solutions broadly fall into two categories: consumer engagement and track and trace.

Track and trace solutions help producers and suppliers to track items through the supply chain, enabling them to monitor when products have expired and mitigate any food safety risk. Consumer engagement solutions are all about

creating a greater connection with the end consumer. To this end, connected packaging can be used to provide more information on the provenance of ingredients or the manufacturing process, or enable loyalty schemes and competitions.

For Tetra Pak, connected packaging has huge potential to communicate how we're making our operations and packages as sustainable as possible. For example, consumers could scan a QR code on their juice carton and learn more about the journey of that package – from tree to table. We can also use connected packaging to reduce our environmental impact. By using the package to share information on where and how consumers can recycle it, we can transform the package into part of the solution – helping people recycle better.

Mona Hassan, Field Service Engineer



As one of Tetra Pak's Field Service Engineers, I'm tasked with preparing customer sites for equipment installation. I work on-site, ensuring our equipment runs smoothly during its lifecycle and provide the wider Tetra Pak team with updates on any issues that could be affecting our customers.

This constant relaying of information about customers and equipment to our colleagues is key to innovation; it's what keeps the factories running smoothly. As well as being out in the field, I must also keep abreast of industry trends. This ensures our customers are up to date with the latest industry developments and maximising the productivity of the equipment they already have.

Finding these new opportunities to innovate for our customers is critical as the level of competition within the food and beverage industry keeps climbing. It requires constant creativity and problem solving in order to stay ahead. Food businesses that survive and grow do so because they are laser focused on

consumer needs and are able to adapt, flex and change to meet them.

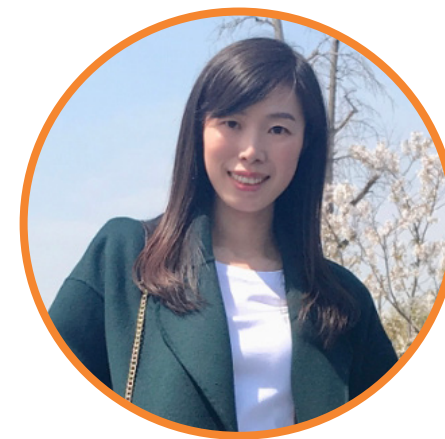
As engineers, safety is always a priority given we work so closely with machinery – this focus also translates to Tetra Pak's products. Food safety principles are core to our practice as we are in direct contact with all our customers' product lines. Thus, our commitment to hygiene and safety directly contributes to the safe and nutritious food that we eat every day.

Being a female engineer hasn't always been easy though. It's a very male-dominated world. Before joining Tetra Pak, my capabilities were often doubted and job opportunities were severely limited, simply because I am a woman! Yet, since joining Tetra Pak, I've worked with people from all different kinds of backgrounds, and I've learnt that diversity is a strength. Women bring a different perspective to engineering and that should be celebrated. Being an engineer is more than a job, it's a passion and no-one should be excluded from this profession.





Carey Liu, Mechanical Design Engineer



As one of the central cogs in the Quality and Technical Support Department, I handle technical issues, coordination and aftersales for Tetra Pak customers in Greater China. It's a fast-paced role, with more than 20,000 customer issues and requests per year in APAC, so we work with enhanced data analysis tools to map the most critical issues which aids prioritisation.

The role requires overall engineering knowledge and a detailed understanding of the end-to-end processing line, which fortunately my Master's degree in Mechanical Design helps me with. No two days are the same; we're managing a wide range of complications – from spare parts and equipment issues to package and spoilage problems – all of which can have a big impact on food safety.

Innovation – whether it be through product life cycle analysis software or setting up an automated chat to respond to customers promptly – seeps

through the entire issues management process at Tetra Pak. Our role is not only to troubleshoot issues quickly and with minimal customer input, but also start to predict issues before they arise. For example, if we're seeing the same issue for several customers, we must find the root cause of the problem to prevent it repeating itself in the future. It's a tricky balance as we've got to be both proactive and reactive at the same time.

Currently, I'm managing a critical strategy project called Reboot together with the central team, which is being chaired by our CEO directly. We're looking to solve all the long-standing pain points that our customers have, deploying quick fixes plus providing the timeline of a long term resolution within 100 days. My role is to mobilise the different teams and collate everyone's ideas and innovations to come up with the ideal solution to each individual issue. It's a big undertaking but I get huge satisfaction from solving major challenges for our customers, so I'm excited to see the results.



Innovating for Sustainability

Environmental activist, Greta Thunberg's 2018 speech at the UN Climate Change Conference of the Parties (COP24), in which she made a call to action on climate change, highlighted what needs to be done to reduce global Greenhouse Gas (GHG) emissions. Now all eyes are on the Paris Agreement, to see what different countries are doing to reduce their carbon footprint.

The Paris Agreement is a landmark international accord that was adopted by nearly every nation at COP21 in 2015 to address climate change and its negative impacts.

With this in mind, the EU says it wants to be carbon neutral by 2050 and has launched The European Green Deal to make the EU's economy sustainable, turning climate and environmental challenges into opportunities. Targets include asking manufacturers and consumers to invest in environmentally-friendly technologies, supporting industries to innovate and working with international partners to improve global environmental standards.

The FAO states: 'If food and agricultural systems remain on their current path,

the evidence points to a future characterised by persistent food insecurity and unsustainable economic growth. Many countries and regions are already committed to increasing the sustainability of their food and agriculture systems. However, fully meeting Sustainable Development Goals (SDGs) targets, as envisaged by the 2030 Agenda for Sustainable Development, will require additional efforts to address growing inequalities and gender imbalances, sustain peace, reduce GHG emissions, avoid resource depleting farming systems, manage the demand for resource-intensive animal food products, and reduce food loss and waste, among other challenges⁸.'

At the heart of Tetra Pak's ambition is to deliver the world's most sustainable food package, made solely of responsibly sourced renewable or recycled materials, fully recyclable and carbon-neutral. It's 'PROTECTS WHAT'S GOOD' strategy focuses on the SDGs to prioritise three sustainability areas; working with its customers and partners to make food safe and available everywhere; safeguarding its employees and supporting communities where it operates and protecting the long-term future of our planet and long-term success of its customers.

⁸ <http://www.fao.org/3/CA1553EN/ca1553en.pdf>



Marie Sandin, VP Engineering & Plant Automation



After starting as an Engineer at Tetra Pak two decades ago, I have progressed through various leadership roles to oversee three connected areas. I oversee Tetra Pak's global customer projects portfolio, I have responsibility for project management and engineering capabilities worldwide, and I lead major transformation projects to improve how Tetra Pak operates in the order fulfilment of capital equipment to our customers.

Tetra Pak is built on innovation – and everyone is encouraged and supported to push boundaries right from day one. Very early on in my career I was selected to project manage Tetra Pak's first re-closable opening – a significant milestone for the company. Following this, I continued to be given the opportunity to work on big, transformational projects, including Tetra Pak A1 – a completely new platform with three packaging solutions.



This focus on innovation has remained consistent throughout my career at Tetra Pak. Now my role – and that of my team – is very much about supporting our customers' needs and ambitions through our portfolio and engineering solutions. I also need to anticipate how evolving customer requirements will impact our engineering needs. We have over 2,000 engineers, working in over 2000 customer projects – all of whom need to be equipped with the right tools and training to deliver increasingly advanced, integrated and connected customer plant solutions.

With oversight of many different areas, initiatives and projects a year, it would be easy for me to immerse myself in the detail. However, to do my role well, I need to always look forward. For me, this means working towards a vision and a desired future state, such as a fully circular food system with zero food waste, zero losses and zero water consumption. These are important areas for our customers, and areas where our innovation can drive real progress.

Elsebeth Baungaard, Food Category Engineer



Denmark

As Portfolio Manager at Tetra Pak, I oversee a large range of extruded, moulded and filled ice cream products. I am a conduit between our customers (ice cream companies) and Tetra Pak's internal innovation teams, making sure that innovation is strategic and meets real customer needs.

Our customers look to us for an understanding of where the market is headed in the short term, but also what consumers will want in 2030. We need to make sure that the factory roadmap enables it to evolve and deliver on shifting requirements for years to come.

Currently I'm driving innovation in extruded ice cream products. Over recent years we've identified a growing trend towards more personified products; ice creams made with two colours for example so that they look like objects,

animals, people etc. Historically, it has been very difficult to run two types of ice cream simultaneously and achieve a consistent result, creating a lot of waste.

Working alongside an external 3D printing partner, we have developed a new multi-section extrusion nozzle for creating shaped ice cream products. This enables our customers to adjust the flow of different product sections, and create clearer, more consistent designs with less waste.

Waste reduction is an incredibly important part of my role – and one which connects me to Tetra Pak's continued drive to operate evermore sustainably. New digital technologies are paving the way here. We want our customers to have a fact-based route cause analysis system, that enables their line to be as efficient as possible.





Sara De Simoni, VP D&E Prog Mngmt & MD Packaging Solutions



I joined Tetra Pak over 20 years ago and am reminded daily why I stay with the business. Tetra Pak's focus on innovation mirrors my own. It is also a multi-faceted, inclusive and environmentally committed business, where I can continuously learn and develop.

My current roles as VP Programme Management (D&E) and MD of Packaging Solutions centre around helping customers discover new solutions and streamlining product delivery. On the packaging solutions side specifically, I focus on addressing customer pain points and finding the most eco-friendly materials for packaging. This is what motivated the development of the Tetra Prisma Aseptic carton.

Innovation is at the core of what we do in development and engineering (D&E). This covers several streams, including packaging equipment and materials, additional supplies (like straws) and digital solutions for customers' processing and packaging functions. Whenever an idea is had, it's up to our team to turn it into innovation, either in the shape of a product or a solution that fits our customers' needs.

Both within the D&E team and the wider company, we're constantly collaborating and tapping into the expertise of other stakeholders. This is key to developing new innovations and making the most of those already in existence – something critical to Tetra Pak's 2030 strategy goal to "enhance sustainability across the value chain". This is an incredibly important objective, and one I'm proud to play a role in achieving.

Sandra Ilofuan, Mechanical Engineer, Services Director



As Services Director for Tetra Pak West Africa, I am responsible for all technical sales and support within the 21 markets we cover in the region. I have a background in Mechanical Engineering and over 15 years' experience in sales, customer management and service delivery.

My role is all about finding new ways to help our customers reach their growth and business objectives by implementing our solutions. As such, it's heavily linked to innovation. I need to stay abreast of fast-changing consumer needs and help our customers evolve their operations to meet these. For example, we're seeing increasing consumer concern regarding the origin of products.

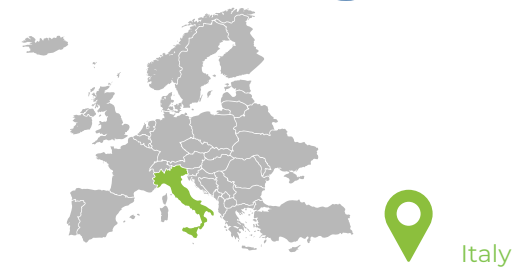
This is likely to manifest in greater demand from our customers for technologies that can be integrated into their factories to enable full traceability.

Another issue scaling consumer and customer agendas globally is sustainability. Customers are exploring ways to become more sustainable throughout the entire value chain. Consumers are looking at ways to avoid single-use plastic and embrace more recyclable packaging. This is feeding into a trend towards 'planet friendly' aisles. While this is more pronounced in developed markets, I'm keeping a close eye on it – and already considering how it could manifest in the emerging markets in my region.





Elena Moruzzi, VP D&E Automation & Digital



I joined Tetra Pak in 2010 as a Project Manager following a role of Project and then Program Manager at Ericsson for over nine years. Since then, I have progressed through the business and took my current position as Vice President Automation & Digital, Development and Engineering (D&E) in 2018. Today, I'm working in the heart of development, focused on securing and mastering the latest technologies to provide customers with the best possible solutions.

My role and that of my team is to translate concepts into tangible solutions, both in terms of equipment and packaging. Artificial intelligence (AI) is playing an increasing role in this. Using the technology, we're able to harvest vast

amounts of data, which has given us greater understanding and control over our processes. This, in turn, has helped us to meet the needs of our customers, and ultimately deliver better quality packages to consumers.

Working in D&E, curiosity and collaboration are key. We have to venture outside the business and connect with cutting edge expertise from around the world to understand the latest technologies and how they can support our ambitions. We also need to incorporate these new technologies internally. This means working closely with our colleagues across the D&E program and with wider Tetra Pak departments. Through doing so, we can ensure the technology we develop supports the end-to-end system we deliver, and addresses any challenges our customers have presented us with.

Hanne Fjeldsted, Food Technologist



My role as Application Technologist at Tetra Pak is heavily focused on research and development. I am a specialist in a separation process for dairy products called membrane technology. I've only been at Tetra Pak for two years but following my Master's degree in Food Science and Technology and a long stint in the innovation department at Arla Foods Ingredients, my whole career has been dedicated to membrane filtration and I love that there's still so many aspects to discover in this niche, but exciting area of the food industry.

Membrane filtration is the X-factor in the processing line for dairy products – whether that's traditional milk, infant formulas or even milk for cheese production. Over the years, membrane technology has developed so much that we can now start extracting similar levels of the immune-supporting protein, lactoferrin from cow's milk, so that infant formula is as nutritious as breast milk. More recently, we've been working out how to design and run a membrane plant for goat's milk, which has additional nutritional value over cow's milk. This was a breakthrough for the industry, and we want to continue

developing innovations like these for our customers.

A key challenge in my line of work is ensuring we deliver the best products for our customers, whilst also looking to streamline resources and costs, reduce waste and improve production yields. This is where the sustainability drive comes in. We've been able to lower operating costs for customers by removing the volume of water in milk, meaning products are lighter and therefore fewer trucks are needed to transport them. What's more, we're working on a ground-breaking pre-engineered concept, which will use known technologies in a new way to bring benefits such as shorter delivery time and lower cost.

Looking to the future, I'm excited about what lies ahead for innovation in this sector. Automation technologies are going to revolutionise the factory and give our customers the tools they need to monitor, iterate and improve production processes in real-time.





Debora Parreira, Packaging Equipment Manager



In my role as Sales & Distribution Solutions Manager, I am responsible for overseeing the process of distributing our packages until the point they reach consumers' homes. This involves managing secondary packaging and handling downstream equipment.

Offering technical and commercial advice to customers is a constant, and in fact, my favourite part of the role. By doing so, we are proactively helping to secure food safety and avoid (or at least reduce) food waste throughout the distribution chain. This aligns with Tetra Pak's sustainable promise too. As we are focused on paper as a key material for primary packaging, we must also promote a secondary package that is environmentally friendly – our eyes and future goals are on creating a package that is 100% renewable and recyclable.

Our key challenge is introducing new sustainability and food safety approaches into our processes whilst keeping costs low for customers. That said, we are now piloting an eCommerce solution with a significant customer in the USA that balances these factors and is also easily automated in our equipment.

Upskilling in data and technology has been key to my career progression, especially as my background is not in engineering. To fight imposter syndrome and limit self-doubt, I seek coaches and mentors within Tetra Pak that will support my learning and give me the confidence boost I need to view challenges from a different perspective.

