INNOVATING AGRI-FOOD

How Ireland’s agri-food sector is evolving for tomorrow
The pace of change in the global agri-food industry has never been greater. Shifting consumer food trends, growing obesity levels in developed economies and the need to lower carbon emissions from agriculture in the face of an escalating climate change crisis are all contributing to unprecedented change in the global agri-food sector.

In Ireland, our export-focused agri-food sector must continue to focus on R&D and new technology development to meet these unprecedented changes.

The Irish Farmers Journal is delighted to partner with Enterprise Ireland in producing this publication, which aims to highlight the world-class agri-food sector that has developed in Ireland.

In this report, we profile a range of Irish companies that are developing cutting-edge agri-technology and new food solutions to meet the needs of a changing world.

It is important to acknowledge the important work that Enterprise Ireland, the state agency charged with supporting Irish businesses in manufacturing and international trade, is doing to support these companies.

Whether it’s through R&D grants, funding for high potential startups, capital expansion, innovation partnerships or funding for lean projects, Enterprise Ireland plays a critical role in supporting Ireland’s agri-food sector. In the face of the risks posed by Brexit to Ireland’s agri-food sector, this support is more important than ever.

Ireland’s agri-food sector represents our largest indigenous industry with companies achieving global success. Vital to the development of our rural communities and regions, this sector plays a critical role in the modern Irish economy.

With advances in technology, a strong and competitive food industry in Ireland is underpinned by the support of a vibrant agri-tech sector. Enterprise Ireland has encouraged food and agri-tech clients across Ireland to focus on innovation to ensure Ireland continues to provide products and services addressing evolving market needs and thereby achieving continued growth. Innovation, in my view, is the key driver of such success and needs to continue to be a major focus.

Enterprise Ireland has been working with players across both the food and agri-tech sectors over many years providing a wide range of supports. We look forward to continuing this engagement to maximise the global success of this critical sector.

We are delighted to partner with the Irish Farmers Journal on this report celebrating the best of Ireland’s agri-food and technology sectors. This report profiles a selection of inspiring agri-businesses with global ambition that Enterprise Ireland has worked closely with and we applaud the achievements of these exemplars.
In 2017, the global food security index ranked Ireland as the world’s most food-secure nation. In awarding Ireland the top spot, the global food security index noted Ireland’s spend on public research and development on food and agriculture, while food affordability, availability, quality and safety had all improved.

Despite this impressive global ranking, the importance of the agri-food sector to Ireland’s overall economy is often overlooked. According to Kevin Buckley, Europe manager for food (foreign direct investment – FDI) at Enterprise Ireland, the annual payroll spend by the Irish agri-food sector is €2.1bn, which is more than any other manufacturing sector.

Ireland’s agri-food sector employs 150,000 people (60,000 directly and 90,000 indirectly), while almost three-quarters (70%) of these jobs are located outside Dublin and Cork. The sector spends more than €11bn annually on materials, with over 70% of these materials sourced in Ireland.

“Enterprise Ireland’s role is to work with the Irish food industry in a bid to foster innovation,” says Buckley. “We work with food companies of all sizes, from high potential food startups to global players like Kerry Group, to help them grow their businesses through innovation. We recognise that innovation is a path to growth for companies so we’re trying to facilitate that innovation process,” he adds.

In the five-year period between 2013 and 2018, Enterprise Ireland invested €247m in its clients across the Irish food industry. This investment by the state agency has leveraged €1.5bn of investment from the industry in expansion, job creation, R&D projects, new product development and new innovations.

According to Buckley, Enterprise Ireland also facilitates innovation within the food industry through the development of R&D infrastructure. This includes the €8m Meat Technology Centre at Teagasc Ashtown, the €25m Dairy Processing Technology Centre (DPTC) in Limerick, the €50m Food for Health Ireland centre at UCD, as well as the recent €10m expansion of the food research centre at Teagasc Moorepark.

NEXT WAVE
Alongside this, Enterprise Ireland has played a key role in nurturing Ireland’s burgeoning agri-tech sector. According to James Maloney, senior regional development executive at Enterprise Ireland, Ireland has rapidly gained a reputation around the world as an “agri-tech island”.

“Globally, agriculture is the least digitised across all sectors,” says Maloney. “But this is changing rapidly. Last year, agri-tech attracted the second largest amount of venture capital funding of any sector with over $2bn invested,” he adds.

Emerging technologies such as sensors, artificial intelligence (AI), facial recognition, automation and data analytics are now being adopted in the latest innovations from agri-tech companies.

According to Maloney, these new technologies will allow the farmer to have more time and to make more informed decisions, with many Irish agri-tech companies leading this change.

“The innovation arena run by Enterprise Ireland at the National Ploughing Championships every year acts like a funnel for the latest agri-tech innovations,” says Maloney.

With the world needing to feed 10bn by 2050, there will always be a need for innovation in the food industry.

In Ireland, the established agri-food industry continues to grow with exports rising 22% since 2013 to reach €13.6bn last year. Alongside this, Ireland has fostered an agri-tech ecosystem that is complementing our established agri-food industry by developing new technologies and digital applications in food and farming.

When taken together, Ireland’s established agri-food industry and emerging agri-tech sector are well positioned to capitalise on the world’s growing need for food.
By international standards, the annual spend on innovation and R&D by Ireland’s agri-food industry is comparatively low. Given the enormous changes taking place in the global food industry, Irish agri-food companies need to continuously invest in innovation and new product development to stay ahead of the competition.
KERRY GROUP: FROM DAIRY CO-OP TO TECHNOLOGY
In October 2015, Kerry Group officially opened the doors on its state-of-the-art new global technology and innovation centre in Naas, Co Kildare. This new facility required a €100m investment to build, making it the single largest investment in food innovation ever by a company in Ireland.

Supported by the Department of Jobs, Enterprise and Innovation through Enterprise Ireland, Kerry Group’s global technology and innovation centre in Naas is the company’s flagship innovation hub and an upgraded replica on a similar facility in Beloit, Wisconsin in the US.

The facility allows customers of Kerry Group to come to Naas and interact with its global suite of flavours and ingredient technologies. The Naas facility is almost like a playground for those in the food industry equipped with sensory kitchens, a culinary suite, a nutrition centre, as well as a discovery centre, which allows customers to collaborate in the kitchen with Kerry’s team of chefs, baristas and food technologists.

Today, the Naas facility employs over 900 people (with almost 40 different nationalities represented) across roles in R&D, sales, marketing, sensory analysis, regulatory compliance, commercial finance and customer care.

HUB AND SPOKE

Kerry operates what it calls a “hub-and-spoke” model. The facilities at Naas and Beloit act as its innovation centres, where it centralises all of its knowledge and technology. These are the central hubs for Kerry’s two more important regions: EMEA and the Americas.

The company also operates a technology and innovation centre in Singapore, which is smaller than Naas and Beloit but allows for similar collaboration with customers in the Asia-Pacific, Middle East and Africa region.

These central innovation hubs are directly connected to the spokes of the Kerry machine, which is its entire network of production facilities, sales offices and regional application centres spread throughout the world. This hub-and-spoke model allows Kerry to be both global and local at the same time.

Kerry’s new global technology centre at Naas is very much the fulcrum of how it engages with customers and is the key cog in its business development strategy for Europe and further afield. A €100m investment like this has very much become par for the course for the Kerry Group we know today.

However, it must be remembered that it is less than 50 years since Kerry Group commissioned its very first manufacturing plant in Listowel, Co Kerry. Since those early days in a muddy field by the banks of the River Feale, Kerry Group has grown – both organically and through acquisition – into a world leader in the taste and nutrition sector of the food industry.

Today, the company operates almost 150 production facilities right across the world, has sales in over 140 markets, employs more than 25,000 people and has a market valuation of close to €20bn. In its simplest form, Kerry’s meteoric growth and evolution as a business is down to its relentless focus on food innovation, R&D and its partnership approach to meeting customer needs.
DIVERSIFICATION

According to Albert McQuaid, global chief technology officer at Kerry Group, a lot of the diversification of Kerry’s business model from its dairy processing roots into what it is today has come through acquisitions over the years.

“Kerry has evolved from a standardised dairy processing company into what we are today. We’re now manufacturing products such as highly functional ingredients for infant formula, protein extracts as well as whey isolates and whey fractionates. A lot of this diversification has come through acquisition but we’ve also developed much of our own technology too,” says McQuaid.

Much of the work that Kerry Group does around food R&D and new product development is customer-led innovation where a large customer might come to Kerry looking for them to solve a problem with a new recipe or develop a new ingredient.

“What we’re trying to do is get into the innovation process of our customers as early as possible and work with them from the start,” says McQuaid.

“We’re trying to discover that next product with the customer. It can take weeks, months or sometimes years to develop new products or innovations for customers. It’s always a journey with customers to develop what they need, which allows us to develop a stickiness with our customers,” he adds.

The success of this partnership approach is clear. Kerry has been working with some of its customers for the past 40 years. McQuaid first joined Kerry Group in the early 1990s having completed a PhD in biochemistry and immediately headed to the US to cut his teeth in the growing ingredients business Kerry Group was building in North America.

The acquisition of Beatreme Food Ingredients for €130m in 1988 was transformative for Kerry and made it one of the largest food ingredients companies in the US. The €370m acquisition of Dalgety in 1998 and the €400m acquisition of Quest Food Ingredients in 2004 further cemented Kerry’s position as a global leader in the food ingredients space.

TECHNOLOGY

However, Kerry was not simply buying up these businesses to consolidate its position in the ingredients sector. The company was also buying new technology, which the wider group would benefit from.

“This focus on acquiring new technology has stood to Kerry over the years, allowing it to move and adapt with the changes in the global food industry. Today, the food industry is changing faster than ever in response to rapidly shifting consumer trends. For Kerry, this disruption brings new opportunities.

“The consumer has a lot more information than ever before and this has translated into a very fast moving food market. The pace of change is unprecedented,” says McQuaid. “This is both a challenge and an opportunity for Kerry. Some products that we manufactured are now obsolete but, historically, change in the food industry has been good for Kerry,” he says. The company’s business model allows it to absorb change, while its continued focus on acquiring/developing new technology allows Kerry to remain at the vanguard of evolving consumer trends.

“In the last five years, the level of consumer demand and sales growth in the plant-based food space has really accelerated. Yet, we’ve been in plant-based foods for 20 years or more,” says McQuaid.

According to McQuaid, it’s still early days in the development of the plant-based segment and the global food industry is trying to position itself to meet the rising demand.

“A lot of the traditional plant-based products were poor in taste and never encouraged consumers to repeat the purchase,” he says.

“But today’s consumer is demanding plant-based alternatives to be just as good in terms of taste and nutrition as the product they’re substituting them for. What we’re now seeing is that our customers are looking to us to help them develop a holistic consumer product that meets the needs of today’s changing consumer.”
Anyone with a keen eye will have noticed that much of Kerry Group’s acquisition activity in recent years has been building its expertise and technology pillar in “free-from” and “clean-label” food manufacture.

In early 2018, Kerry entered into a joint venture with Ojah, a Dutch company that manufactures plant protein products. By the end of 2018, Kerry rounded out the year with another significant acquisition – a €178m deal to buy Ariake USA, which is the North American division of Japanese natural seasonings maker Ariake Japan. The company manufactures clean-label taste solutions derived from poultry, pork and vegetables at its facility in Virginia.

These two deals in particular further enhance Kerry Group’s portfolio of clean-label and plant-based technology.

According to McQuaid, the Dutch company Ojah created a plant protein product that overcame the traditional taste and texture barriers that this category has, which first attracted Kerry to the business. However, the big win from investing in the business is that it allows Kerry to take massive learnings from Ojah’s technology platform and share this across its entire business. The strategy is the same for the Ariake USA investment.

What Kerry Group has learned very quickly is the sheer breadth of applications it can use its plant-based or free-from technology for. The plant-based trend is not just a phenomenon faced by the global meat sector.

Rather, plant-based proteins are finding their way into a whole spectrum of end-use markets. There are now plant-based alternatives for everything from ice cream to yoghurts to meat and to milk. While these food segments are separate, Kerry understands that the technology used to develop them is adaptable across a whole range of applications.

According to McQuaid, Kerry Group watches the food sector very closely for emerging startup companies that are bringing new technology to market. Many of these food-tech startups, such as California-based plant-based company Impossible Foods, is growing at incredibly fast rates right now because the plant-based market is so fragmented.

However, while demand is coming thick and fast for these companies because they have developed a good technology, many of them have no idea of the scale needed to service that level of demand or of the supply chain complexity that comes with real scale. And that’s where Kerry comes in.

“We’re looking to tap into the fast growth of startup food-tech companies. Because of the market fragmentation, there’s huge potential for consolidation,” says McQuaid.

Not only does Kerry serve its customers by developing new ingredient solutions or food innovations but it also shows its customers how to scale a new innovation or food solution in its business in terms of developing a new supply chain or tweaking its manufacturing process.
In 2013, Pat Rigney was on the hunt for investors. A former senior director at Baileys and a co-founder of the Boru vodka brand, Rigney had developed a business plan to start a new distillery in the west of Ireland that would make premium gin, whiskey and vodka targeted at the high-end of the consumer drinks market.

Despite a proven track record in the drinks sector developing brands such as Sheridan’s cream liqueur, Rigney was repeatedly given a flat no by banks, venture capital funds and state agencies when looking for startup funding to get his new distillery off the ground.

Convinced he was on the right track, the Dublin native persevered and finally caught a break when Enterprise Ireland agreed to support his new business.

Under the state agency’s high potential startup (HPSU) fund, Rigney was able to draw down €275,000 in seed funding. This investment funding from Enterprise Ireland went a long way in helping to establish Rigney’s new distillery, which required a total investment of €1m to build.

On top of this, the new startup company could also draw on the significant marketing resources in Bord Bia to develop its new range of whiskey, gin and vodka brands.

Known as The Shed Distillery and located in Drumshanbo, Co Leitrim, Rigney’s business today employs 35 people, has export sales to 40 international markets and will open a €2m visitor experience centre next summer.

“When we went about establishing this venture, Ireland was still at the end of the crash. I went to the banks and all the funding houses, many of whom are supported in some shape or form by state agencies, and they all said no. And I have a good track record,” says Rigney.

“The only people who stepped up to the plate were Enterprise Ireland and Bord Bia, who helped us with our brand creation. If they hadn’t supported me, those 35 people in Drumshanbo wouldn’t have jobs today,” he adds.

The success of The Shed Distillery is all the more heartening given that it is located in Co Leitrim, an area of Ireland that has traditionally been starved of inward investment. According to Rigney, the decision to locate his new distillery in Drumshanbo was an easy one.

“Firstly, my parents first met in Drumshanbo. My mother worked in the Arigna mine outside the town and my dad was a bookkeeper just next door. So that was a nice connection to the area. But the real reason I chose Leitrim was the community here,” says Rigney.

“I met Leitrim County Council and the local community here in Drumshanbo in December 2013, which was probably the darkest time after the crash. And I just connected with the people. They couldn’t have been more helpful, more constructive or more positive. And I made the decision to base the new distillery here within 24 hours of that meeting,” he adds.

Aside from the head distiller who came from the US, all the employees at The Shed Distillery are locals who have been trained into the business, says Rigney.

“We work very closely with the community. We’re located at the Food Hub in Drumshanbo, which is a community project. We lease our space in the Food Hub from the community and we’re very focused on building jobs in the area,” he adds.

Right now, the company is in the midst of a €2m capital investment to build a new visitor experience centre alongside the modern distillery, which will be open to tourists in 2020.
While the establishment of The Shed Distillery has brought inward investment and created local jobs for Co Leitrim, it has also put the small town of Drumshanbo on the map like never before. The company’s flagship brand, Drumshanbo Gunpowder Irish Gin, has been a major success, both here in Ireland and internationally. Last year, the business sold its 100,000th case of Drumshanbo Gunpowder Irish Gin with export sales to markets such as the US, Hong Kong, Russia, the UK and all throughout mainland Europe.

Alongside this, The Shed Distillery has a unique vodka brand known as Sausage Tree Pure Irish Vodka, which stands out thanks to the bright red bottle it comes in.

These are what Rigney describes as “remarkable brands”, which he says are built by remarkable people from a remarkable community.

In 2020, The Shed Distillery will bring its first whiskey brand to the market. According to Rigney, this new brand of Irish whiskey will be a five-year-old whiskey marketed at the higher end of the $58bn (£52bn) global whiskey market.

Leaning on his past experience working for Baileys and building the Boru vodka brand, Rigney is building a new range of global drinks brands from a very rural part of Ireland. Importantly, the brands Rigney is building are steeped in the story and people of Drumshanbo, Co Leitrim.

The success of The Shed Distillery only goes to prove that rural Ireland has many attractive qualities for startup businesses to leverage. You only need to embrace these qualities and you too can build a remarkable business.
It’s interesting how a business opportunity can suddenly present itself. Take for example brothers Tom and Padraig Hennessy, who ran a business laying water pipes on Irish farms. In the course of their work, the Hennessy brothers noticed how Irish dairy farmers were repeatedly asking them if they had a way to accurately measure mineral rates in water.

“Enough farmers were asking us how could they measure mineral rates in their water systems that we could see there was clearly a market for this type of technology,” says Padraig Hennessy. “We looked around in New Zealand and Australia to see if there was a product we could import and distribute here in Ireland. But we didn’t see anything that was good enough so we decided to develop our own system,” he adds.

Seeing this gap in the market, and more importantly the market in the gap, the Hennessy brothers developed their own system to regulate and accurately measure the dosage of minerals that goes into a water system for animals on a farm, be that pig, poultry or cattle farms.

The system, which is plug and play, allows the farmer to accurately regulate the dosage of impor-
tant minerals such as magnesium, to animals via the existing water system on the farm. And, so, Terra the Nutritech mineral system was born.

Since it was first established in 2012, Terra Nutritech has gone from strength to strength and is now one of the brightest stars of Ireland’s burgeoning agri-tech sector.

“Since we first started in 2012, we’ve doubled the size of the business every year. We really bootstrapped along the way but we’re now self-funding our expansion. In the last number of years, we’ve invested over €2m in new offices and a manufacturing site,” says Padraig Hennessy, who is chief executive at the company. His brother Tom is the chief operations officer for the business.

Export Growth

Having established its name and its technology in Ireland over recent years, Terra is now targeting growth from export markets. Earlier this year, the company was given the opportunity to present at the One conference in Kentucky, which is organised every year by Alltech.

We were exhibiting at the Eurotier trade show this year and roughly two-thirds of the enquiries we got were potential customers asking if our system could be used in pig and poultry systems.

“The One conference in Kentucky gave us huge international exposure. We will open two new export markets by the end of this year on the back of it,” says Hennessy.

While Terra developed its business selling mineral systems to dairy farmers, the company sees future growth potential installing its technology on pig and poultry farms.

“We were exhibiting at the Eurotier trade show this year and roughly two-thirds of the enquiries we got were potential customers asking if our system could be used in pig and poultry systems,” says Hennessy.

“The focus on antimicrobial resistance (AMR) is huge right now and farmers have to be way more targeted in their antibiotic usage. Farming is becoming all about precision, which is creating opportunities for our technology in these sectors,” he adds.

To reduce antibiotic usage in poultry and pig production, farmers are using acidifiers to improve gut health in animals. However, the farmer still needs to be able to administer these acidifier products at the right dosage, which is where Terra’s technology comes in to play.

Technology

Alongside the growth in new markets, Terra has continued to evolve its mineral dosage systems with new controllers and upgrades. Last year, the company launched its new mineral dosing system called the Opis Controller at the 2018 Ploughing Championships.

The rollout of this new system has underpinned continued growth in the home market, with Hennessy forecasting the business will achieve 40% to 50% growth in Ireland this year.

Terra also entered its Opis Controller system at the Innovation Arena at last year’s ploughing championships. The company has since become a client of Enterprise Ireland’s and has worked closely with the state agency over the last nine months.

“We’re a relatively new client of Enterprise Ireland’s but in that time we’ve done a lot of work around sales and strategy training, which I’ve found to be really good,” says Hennessy.

Terra has recently hired a university graduate to join its IT team with Enterprise Ireland funding 50% of the new employee’s wages over the next two years through its GradStart initiative. On top of this, says Hennessy, the company has been able to access Enterprise Ireland’s network of international offices and dedicated market research, particularly for markets such as New Zealand where Terra is eyeing new sales opportunities.

“Enterprise Ireland also paired us with a business mentor from the agribusiness sector here in Ireland. Our mentor is someone with past experience of growing a company in international markets and is able to give us some really useful and practical insights into how we can take Terra to the next level,” he adds.

Future

Almost seven years in business, Terra has invested over €2m in a new head office and manufacturing site in Co Kildare and employs 20 people today. In that time, the company has established itself in the Irish market with a brand and product that is well-known to farmers.

However, Terra is now starting to intensify its focus on building export sales, particularly as precision agriculture becomes increasingly important. The company is taking the next steps and looking to larger markets such as France, the US, South Africa and New Zealand and looks set for another wave of growth to take it to the next level.
Larry Murrin, CEO of Dawn Farm Foods, says: "Great ingredients make great food and great ingredients come from outstanding food innovation."

Murrin believes that one of the essential building blocks of Dawn Farm Foods has been food innovation. He says developing new products to meet changing consumer tastes has been at the heart of the growth of Dawn Farm Foods for over 33 years. Today, Dawn Farm Foods supplies a fast-moving market that is constantly evolving. Such is the scale of product churn, it doesn't make a single product the same today as it was making 10 years ago.

GLOBAL FOOD PRINT
The company supplies world-leading food brands across more than 44 markets, such as Subway and Pizza Hut. Chances are if you have eaten a pizza or a sandwich in Europe with cooked meat, it came from Dawn Farm Foods' factory in Naas, Co Kildare. Its products are available in more than 20,000 retail and food service outlets across the UK, Europe and the Middle East every day.

But it wasn’t always this way. It is less than 35 years old, having been established in 1985. "We were a 12-person startup with a 4,000 square foot warehouse and a small cooked meat plant, from which we intended to sell deli cooked meats to Irish supermarkets,” explains Murrin.

Within five years, the business was turning over €5m, and even though it had garnered a fair share of the Irish market, Murrin and his team knew there was more potential. He explains: "The Irish market wasn’t really that big and rather quickly we soon realised if we wanted to grow, we needed to export."

But consumer habits around food were beginning to change and a variety of foods started appearing on supermarket shelves. "We could see an opportunity if that trend was to continue. Brands were going to need companies to deal with the challenge of customising ingredients that made manufacturing of their products easier," says Murrin.

This allowed the big food brands outsource aspects of their manufacturing processes in order to focus their efforts on assembly, creativity and marketing. He says they used their capabilities in meat to craft customised solutions for brand holders that they could incorporate into ready meals, recipe dishes, sandwiches, pizza and snacks.

One of the really big breakthroughs came in 1988 when Pizza Hut UK chose Dawn Farm Foods as one of its suppliers of pizza toppings. Within two years, it was its sole supplier of pizza toppings in the UK and, two years later, it was its sole supplier of pizza toppings throughout Europe. Employing 700 people in Naas and a further 400 on its Northampton site in the UK, Dawn Farm Foods is now the largest cooked meat ingredients company in the world outside of North America.

It is estimated that up to 50m people per week eat a product that has an ingredient from Dawn Farm Foods. It produces 500 different products every week and more than 90% of everything is exported, with just under one-third going to the UK. The majority of meat is sourced locally.

INNOVATION
New food trends emerge all the time and staying ahead of the competition requires constant innovation, according to Murrin. "We are constantly researching global and local food markets to identify such trends," he adds.

Food innovation is an essential element of the
business and every facility offers a best-in-class science and innovation centre. Every recipe they develop begins with the best “better for you” ingredients. Dawn Farm Foods has a team of highly experienced chefs who work with food scientists to create innovative ingredients. All its products are 100% free from artificial colours, hydrogenated and trans-fats, non-sustainable palm oil, nuts and MSG and have complete farm-to-fork traceability.

It is one thing having an idea, but the key is bringing it to market. The business has a novel approach to how it converts ideas into successful products quickly and efficiently. It uses a robust stage-gate process system it calls NECTAR (Need, Explore, Create, Test, Act, Review).

Dawn Farm Foods supplies products across more than 44 markets, such as Subway and Pizza Hut.

Its R&D centre in Naas employs 30 people. It is currently halfway through investing a further €25m in research over a five-year period which will see the creation of 150 jobs. This significant investment will enhance the company’s capacity to research consumer trends, develop new products and develop new production technologies. The investment was supported by the Department of Jobs, Enterprise and Innovation through Enterprise Ireland.

Dawn Farm Foods is seeing consumers’ tastes continue to evolve and the business closely monitors these trends. Murrin says they are seeing more demand for home-style authentic meats, new flavours and new snacking options, as well as ongoing interest in health and wellness across the range of cooked meats.

According to John McGrath, head of business development, among the key challenges that Dawn Farm Foods has had to overcome is developing an intimate knowledge of each of the export markets that it services.

“That involves developing the right product for the market that fits with local consumers’ needs, tastes and price expectations, while also fulfilling any regulatory obligations and requirements in that market,” says McGrath.

BUILDING RELATIONSHIPS

Through years of experience, the company has developed a partnership approach that has resulted in an ongoing pipeline of new and profitable products for its customers. Murrin believes working together can unlock value-added opportunities for both Dawn Farm Foods and its customers, while it also gives customers a competitive edge.

He believes an emphasis on developing long-term relationships with customers has been key to the company’s continued success.

This partnership approach at Dawn Farm Foods is best illustrated in its relationship with Subway, the global sandwich chain. In 2017, Dawn Farm Foods announced that it had signed a seven year deal with Subway to supply over 4000 Subway restaurants in over 30 countries across Europe. The deal is worth €850m to Dawn Farm Foods over the seven year period.

More impressively, by the time this deal expires, Dawn and Subway will have been working together for more than 30 years, with the relationship first starting in 1993. You can expect this partnership to continue for many years ahead.
By their very nature, consumer trends evolve and shift all the time. For the food industry, differentiating between a short-term fad and a long-term mega-trend can be the difference between success and failure.

One area that almost certainly is a mega-trend in food is the rapid growth we’re seeing in plant-based food consumption. With concerns about health, animal welfare and climate change, consumers in developed markets such as Europe and the US are increasingly trying to cut down meat consumption and are looking to plant-based alternatives instead.

A recent study carried out by YouGov, the UK-based market research and data analytics firm, found that more than a quarter (26%) of UK meat eaters said they plan to reduce their level of meat consumption in the next year with health concerns the primary reason provided. Over 40% of respondents also identified animal welfare concerns as a reason for reducing meat intake.

The YouGov study paints a picture where the flexitarian diet is becoming increasingly prevalent among UK consumers who are looking to cut down on the amount of meat they eat due to health concerns.

**OPPORTUNITY**

While this trend presents enormous challenges for traditional meat processors and livestock farmers, it also creates opportunities for early adapters and new startups. One Irish food company seizing on the opportunities presented by fast-changing consumer food trends is The Happy Pear.

Founded in 2004, The Happy Pear is a family-run business owned by the four Flynn brothers – Darragh, David, Mark and Stephen. Twins David and Stephen Flynn are the high-profile faces of the brand, while Darragh and Stephen are also directors in the company.

What started out as a small vegetable shop in Greystones, Co Wicklow, The Happy Pear has evolved...
into a small chain of café outlets as well as a considerable food export business. The Flynn brothers now operate three Happy Pear cafes – two in Greystones and one in Clondalkin, Dublin. The brothers also plan to open a café in Dublin Airport by the end of this year.

However, the real driver of growth for The Happy Pear has been the company’s range of prepared meals, soups, breakfast granola as well as its pesto and hummus spreads. The Flynn brothers have developed The Happy Pear as a vibrant and attractive consumer brand that is winning the company a lot of business with retailers in Ireland and the UK.

In 2016, the business raised €1.5m in funding, which included a capital grant from Enterprise Ireland, to build a new 14,000sq ft production facility in Kilcoole, Co Wicklow. The Flynns christened this new facility “Pearville” and it is used to manufacture some of the company’s range of plant-based products.

On the back of this investment, the Happy Pear went on to launch its branded range of plant-based products with Irish retailers SuperValu and Centra, as well as other independent foodie outlets. This listing with SuperValu and Centra saw sales in the company jump from €4m in 2015 to €6.5m in 2017.

However, in the last 18 months, the company has begun to achieve accelerated sales growth after moving into the UK market for the first time. Since 2016, twins David and Stephen have worked with Waitrose, the high-end supermarket chain in the UK, creating videos to explain vegan recipes as well as appearing at customer events.

The brothers built on this existing relationship, which led to The Happy Pear signing a deal in 2018 to supply six of its branded vegan products to Waitrose’s nationwide chain of stores in the UK.

This deal immediately accelerated sales growth for The Happy Pear as Waitrose is the UK’s eighth largest supermarket with a 5% share of the £200bn UK grocery market. The company’s turnover increased substantially last year, close to €10m, on the back of strong growth in export sales to the UK market.

GROWTH

The growing prevalence of plant-based foods and diets in developed markets means there is huge opportunity for The Happy Pear business to continue its double-digit expansion over the coming years.

The company is now focused on extending its product range to meet consumer needs from breakfast to dinner. In August, The Happy Pear launched two plant-based burgers. The first was a quarter pounder-style product made from mushrooms, sweet potato and beetroot, while the second was a falafel burger. On top of this, the company is also planning to launch a range of plant-based sausages by the end of 2019.

Importantly, the Flynn brothers have developed a colourful and strong brand, which will allow them to develop their business with retailers hungry for sales growth by partnering with upstart brands such as The Happy Pear.

LEAN

The rapid sales growth experience by The Happy Pear has been matched by employee numbers in the business. Since 2015, the number of employees in the business has almost doubled from 63 to 120 this year.

Such rapid expansion of the company has seen The Happy Pear become a client of Enterprise Ireland to keep its manufacturing operations efficient. Under Enterprise Ireland’s range of lean business initiative, the Happy Pear undertook a Lean Plus strategy across the business.

The aim of the company’s Lean Plus strategy was to upscale its manufacturing processes to meet the growing demand from customers such as Waitrose and SuperValu, while maintaining manufacturing efficiency at all times.

Implementing Lean Plus saw the company increase output by more than 40%, while saving more than €30,000 on direct labour costs at the same time.
The pace of change in the global food industry has never been so great. Food companies around the world are increasingly having to react to fast-changing consumer trends and disruptive new technologies.

Yet, at the heart of most trends in the food sector is a desire from the consumer for improved nutrition and healthier food without any compromise on taste. While this has presented headaches for many of the world’s largest food multinationals, it has also created opportunities for new entrants and startup companies.

Ireland has produced its fair share of these startup companies bringing new technologies to the global food industry. One such example is AnaBio Technologies, a Cork-based startup that is making waves in the precision nutrition space, thanks to its innovative encapsulation technologies.

Dr Sinéad Bleiel, founder and CEO of AnaBio, first established the company in 2011 on the back of her PhD research at Teagasc Moorepark and University College Cork (UCC), where she began using whey proteins derived from milk to encapsulate and protect probiotic bacteria.

In simple terms, Dr Bleiel developed a platform of different technologies that encapsulate nutrients, minerals, probiotics and other important ingredients and can then protect them from high heat during food processing, degradation in storage and also from acids in the stomach or intestine after consumption.

“In essence, we take different protein sources, including milk, whey and veg sources, and use them as a protective coating for probiotics, amino acids and other nutrients. Think of it like the coated shell around Smarties sweets or the multiple layers of an onion,” says Dr Bleiel.

According to Dr Bleiel, the major selling point of AnaBio’s encapsulating technology is the functionality and stability it offers food manufacturers looking to add new ingredients to recipes, which can cause problems.

Coating an ingredient with AnaBio’s encapsulating technology can stabilise the ingredient and make it more functional during processing. It can also help to stabilise the shelf life of a product, as well as allowing the nutrient or probiotic in the food pass through the human digestive system and be delivered to the gut. The company has also adapted its technology to be used in animal nutrition.

STANDING START

From a standing start, the company has built up an international customer base and has not looked back.

“We started exporting to international customers from the start. It was only after we established ourselves with these customers that several of the key players in the Irish food industry came on board,” says Dr Bleiel.

“Our largest export market is the US followed by sales in the EU and the Gulf region. Our next largest export market is Australia,” she adds.

In 2016, AnaBio carried out a small round of fundraising where it received support from Enterprise Ireland’s high potential startup (HPSU) fund.

“If your company shows potential to employ more people and that it is set for export growth then Enter-
prise Ireland will show great support,” says Dr Bleiel. “Since becoming a client of Enterprise Ireland, we have received supports for marketing, introductions to potential new customers, new market development and of course some funding under their HPSU fund,” she adds.

AnaBio now employs more than 30 people and has recently completed a significant investment to retrofit a production facility in Carrigtwohill, Co Cork, to meet growing demand. Retrofitting the Carrigtwohill facility meant the construction of three new laboratories for the company’s team of researchers and the installation of custom-fitted production lines for its manufacturing process.

“We commissioned the Carrigtwohill facility last year and it’s going really well,” says Bleiel. “This was a sizeable investment for a company our size but we needed to make it to make sure we could meet growing demand for our products.”

Last year, the company appointed Dan McSweeney, the former CEO of Irish dairy company Carbery Group and current chair of Bord Bia, as chair of AnaBio.

SCIENCE
Despite a growing customer base and expansion in international markets, Dr Bleiel is adamant that the company has to remain focused on its core business – science.

“What we’re selling here is science. We research the science, we validate the science and then we sell the science,” she says.

“When I look at our sales markets, I don’t want to sell to every company in the market. Instead, I’d rather work with a small number of companies that understand the value of AnaBio’s science and are prepared to pay for it to make better products.

“We seek to work with a customer who understands our science and can sell our science to their customers in turn,” she adds.

Right now, the company has 13 global patents on its encapsulating technologies that have been designed in-house by the company’s R&D team.

“Our focus has to remain clear. AnaBio is a research-driven company and it must be focused on practical innovations at all times,” says Dr Bleiel.

AnaBio’s encapsulation technology has allowed it to eke out a niche position for itself in the global precision nutrition market. However, as consumer trends in the food industry accelerate demand for precision nutrition is only going to increase. The company looks well-positioned to capitalise on this growth.
Adapt or die?

Fast-changing consumer tastes are forcing Irish food businesses to be more agile than ever before, writes Lorcan Allen. Drover Foods in Wexford is a company relishing the challenge.
On the outskirts of Wexford town, you will find Drover Foods, a family-run business that’s been making pork sausages since the early 1980s. Yet despite its long heritage in the pork sector, Drover Foods is a business that finds itself moving further and further away from meat processing as it responds to rapidly changing consumer trends.

Right now, the biggest driver of sales growth in Drover’s business are its new lines of vegetarian products such as falafels, fritters and Indian pakoras. According to Anne Smyth, managing director of Drover Foods, the company is simply adapting its business to meet changing consumer trends in the food industry. However, the root of the company’s decision to start making veggie products was Brexit.

“In 2016, when the Brexit vote happened, all we made at Drover were cooked sausages and stuffing with 83% of our sales coming from the UK market,” says Smyth. “Straight away, I knew we needed to get into new markets in mainland Europe but I had no way of getting into those markets with the products we were making. We were going to have to diversify our product range” she adds.

At the same time, Smyth was taking part in Enterprise Ireland’s Leadership 4 Growth programme, which is Enterprise Ireland’s flagship programme for managing directors and CEOs looking to develop their business.

As part of the course, Irish executives from all business sectors receive training at the IESE business school in Barcelona, which has been ranked first in the world for customised executive education by the Financial Times for the last number of years.

“We were having a discussion group one week on the course and I was asked to outline to executives from the other companies a problem that my business was facing. So I explained that I needed to diversify my business,” says Smyth.

“And I was asked a very simple question in response. What does Drover Foods actually do? I replied that we make cooked sausages for the B2B market in the UK but the more I thought about it, the more I realised I didn’t know exactly what the company did. When you peel back the layers of the onion what do we really do?”, she adds.

That evening, Smyth sent an email to the senior management team at Drover Foods asking for a one-line answer to the same question. What does Drover Foods do?

“The answers I got back were all the same as what I had originally said. I knew we needed to be clearer on what this business is really about,” she says.

After some further thought, Smyth and her team finally got to the core of what Drover Foods was about. She describes her family company as a food business that makes pre-portioned, fully cooked, food ingredients that are sold B2B to food companies.

“Everything we make ends up as an ingredient in sandwiches and ready meals sold by supermarkets. We supply the ingredients for the own-label sandwiches you get in Tesco, Waitrose, Asda, Costa, Boots and others places,” says Smyth.

Greencore, the UK-listed convenience foods manufacturer, is Drover’s largest customer, while the company’s second largest customer is Samworth
Brothers, which is a privately owned company with 15 factories in the UK making private-label convenience foods. Domino’s Pizza is also a large customer with Drover supplying sausage toppings for its meat pizzas.

**CLARITY**

Viewing her family business as a supplier of pre-portioned and cooked food ingredients allowed Smyth and her management team to see the business in a new light. They could now see the company’s position within the food supply chain was not simply confined to pork.

“I was flying out of East Midlands Airport in the UK one week and I saw this fried food ingredient,” says Smyth. “I asked a colleague what the product was and she told me it was a falafel, which is made from minced chickpeas. I’d never heard of a falafel before but I instantly knew we could make it with the equipment we had in the plant.”

None of us knew the recipes or flavours that went into making a falafel so we employed a Lebanese chef from Dublin and within six weeks we were making falafels. And we didn’t have to spend any money because we already had all the necessary equipment in the factory,” she adds.

While she had some awareness at the time of the growth in plant-based foods and flexitarian diets, Smyth says it was never intentional to move into making falafels. And now we’re moving into veggie products,“ she adds.

Importantly, the transition to making falafels and other vegetarian food ingredients has opened up new possibilities for Drover Foods as regards finding new business and markets away from the UK.

“Thirty years ago, this factory only made raw sausages. Twenty years ago, we started cooking sausages and, 10 years ago, we started making pork-based stuffing. And now we’re moving into veggie products,“ she adds.

Demand for the new range of veggie food ingredients has grown rapidly. If you buy a hummus and falafel wrap in Tesco supermarket anywhere in the UK today, the falafel ingredient will have been made by Drover.

“Right now, all of our sales growth is coming from our veggie products. There was a 4% decline in sausage consumption in the UK last year, which is a huge number when you think of how big sausage consumption is in the UK,“ says Smyth.

“Today, most of our growth is in our veggie range of products and we see this continuing into the future.

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Importantly, the transition to making falafels and other vegetarian food ingredients has opened up new possibilities for Drover Foods as regards finding new business and markets away from the UK.

“We went to Internorga to see how our products would be received. It was purely exploratory but we got a really good reception for our falafels,” says Smyth.

“All our data and marketing information tells us that ready-to-eat falafels, fritters and pakoras will sell better in northern Europe. This is because there is huge cultural diversity in markets such as Germany where Middle Eastern cuisine has a big influence,” she adds.

Drover is very much on the start of its journey to diversify its sales into export markets and it will take time to build customer relationships in markets such as Germany.

With the support of Enterprise Ireland, the company has just completed a €4m investment in its Wexford facility that will add capacity and allow Drover to produce oven-baked products. On top of this, Drover has recently employed a European business development manager to try to grow sales into Germany and other northern European markets.

However, the company is not prepared to give up on the UK market either, no matter what Brexit may bring.

Drover has long established deep relationships with customers such as Greencore and Samworth Brothers, and the reality is the UK market will always have a reliance on food imports.

“I suppose Brexit has brought some good things in that it has forced us outside our comfort zone in the UK. But that’s not to say the UK has not become a bad market overnight,” says Smyth.

**COMPANY PROFILE**

**Company:** Drover Foods.

**Location:** Wexford town, Co Wexford.

**Turnover:** €13m.

**Employees:** 57.

**Managing director:** Anne Smyth.

This is especially true when you consider a recent YouGov study, which found that almost 15% of the UK population identify themselves as having flexitarian diets. The study also found that more than one-quarter (26%) of UK meat eaters said they plan to reduce their level of meat consumption in the next year, with health concerns the primary reason provided.

As such, it will be interesting to see where the next 10 years takes the Drover Foods business. Anne Smyth and her senior management team have redefined the business as a supplier of fully cooked and pre-portioned food ingredients, which means the company has the adaptability and agility to follow consumer trends long into the future.
In order to compete successfully in global markets, Irish agri-food companies must be highly efficient as they operate in a high cost economy. Through lean business principles, investment in automation and manufacturing efficiencies, many Irish companies in the agri-food sector are finding the edge they need to compete successfully in global markets.
n Friday 24 June 2016, the world awoke to the news that the UK had narrowly voted to leave the EU. As the dust began to settle on this seismic decision in the days and weeks after, Ireland’s agri-food industry immediately began drawing up contingency plans.

In all the analysis leading up to the Brexit vote, Ireland’s agri-food sector was repeatedly highlighted as the sector that had the most to lose from the UK leaving the EU. Within the overall agri-food industry, some sectors were more exposed to the UK than others.

In the meat sector, over half of Irish beef and pork was sold to UK buyers every year, while almost 100% of Irish mushroom exports ended up in UK supermarkets and foodservice outlets. On the dairy side, the UK is an enormously important market for Irish butter, right up there with Germany and the US.

However, it was Ireland’s cheddar cheese industry that found itself most exposed to the UK. At the time of the Brexit vote, the UK accounted for 115,000t, or almost two-thirds (65%), of Irish cheese exports. In the intervening period, Ireland’s cheese industry has done a remarkable job of lowering its exposure to the UK market.

While the UK still takes 115,000t of Irish cheese today, Irish dairy co-ops are now shipping around 117,000t of cheese to non-UK markets. This means the Irish dairy industry has found a new home in international markets for an additional 75,000t of cheese.

Despite this impressive progress, the UK still accounted for 50% of all cheese exports in 2018, meaning that significant risks remain for Ireland’s dairy sector should a no-deal Brexit go ahead. As such, Irish dairy companies have continued to invest in new cheese processing capabilities that will allow them to target emerging export markets in Asia and
Diversify

Carbery Group, the west Cork dairy processor, is a perfect example of this diversification. In 2016, Carbery found itself particularly exposed to Brexit as it produced around 50,000t of cheddar annually from its Ballineen factory, accounting for 25% of Ireland’s total cheese output. Much of this cheddar was destined for the UK market.

To lower its exposure to a single market, Carbery announced a significant product and market diversification project, with the co-op investing €78m to diversify cheese production at its Ballineen processing facility. This major investment will allow Carbery to move into processing pasta filata-type cheese offerings, primarily mozzarella, which will be targeted at emerging markets in Asia.

As part of the investment, Carbery worked closely with Enterprise Ireland to scope out what grant aid funding was possible under state aid rules. Enterprise Ireland approached the European Commission on behalf of Carbery and was able to help the dairy co-op secure approval for the European Commission for the Irish Government to provide €5.57m in state aid funding to build the new facility.

According to Colm Leen, chief financial officer at Carbery, construction of the new mozzarella facility is well under way at Ballineen and should be ready for commissioning in March or April next year ahead of the peak milking season.

“The €78m investment at Ballineen is the core part of our diversification plan,” says Leen. “We’re going to be targeting rapidly growing cheese markets in Asia like China, Japan and Indonesia with our mozzarella range. Global foodservice chains and rising pizza consumption in these markets are driving demand for cheese,” he adds.

In July, Carbery opened its first office in Jakarta, the capital of Indonesia. This footprint on the ground in a market of 264m people, will allow the company to better service new customers in the region for its flavours and dairy nutrition offerings.

R&D Investment

Alongside this diversification into new markets and cheese types, Carbery continues to invest in research and development (R&D) as part of its overall business strategy.

“A key component of Carbery’s strategic plan is continued investment in R&D. Effectively, this means driving innovation in our products and processes to create value for our customers,” says Leen.

“This R&D work is executed under our three strategic growth pillars of dairy, nutrition and taste. Over the years, Enterprise Ireland has supported Carbery in some of our innovation initiatives as we pursue our strategic growth plans. That support has come by way of funding and occasionally resource assistance in developing our entry to new market geographies,” he added.

According to Leen, this support from Enterprise Ireland has been received under the three broad categories; research, technology and innovation (RTI), business transformation (Lean) and training support.

Long-term Health

While Ireland’s dairy sector initially found itself exposed to Brexit through our reliance on the UK market for cheddar exports, the industry has taken decisive action to diversify into new markets while at the same time investing in new cheese production facilities that offer alternatives to traditional cheddar.

In the long run, the significant investments being made by Carbery and other Irish dairy co-ops will stand to the industry and drive exports to faster growing markets around the world.

However, the demand in these markets is not for cheddar, which has traditionally been the backbone of Ireland’s cheese industry. As a result, Irish dairy co-ops have invested in new processing facilities that will allow them to produce other varieties of cheese.
In a relatively short period, Oakpark Foods has diversified its product range in order to win new business in Europe. Lorcan Allen reports.

Last year, Ireland shipped roughly 150,000t of pork to the UK, which was valued at €373m. This was more than half (56%) of all Irish pork exports last year, underlining the pork sector’s reliance on the UK as an export market but also its exposure to Brexit.

Oakpark Foods, one of Ireland’s largest pork processors based in Cahir, Co Tipperary, has been exporting to the UK for more than a decade thanks to nationwide contracts with supermarkets Lidl UK, Morrison’s and Iceland. Of Oakpark’s €35m in turnover last year, almost 40% was generated from export sales with the majority of export sales coming from the UK.

In a bid to de-risk from the UK market, Oakpark managing director David Brett has been steadily steering the company in a new direction and is starting to build sales with new customers in mainland Europe.

However, developing new customers in Europe for a traditional Irish pork business is not straightforward. According to Brett, the company has had to adapt its product range to the tastes of European consumers as rashers and bacon joints are not widely consumed products in Europe.

INVESTMENT

Instead, Oakpark has started producing new product lines of streaky bacon and lardons on a much larger scale to win over more European customers. The company is midway through a €1m investment in R&D and new product development spread over three years, which has been supported by Enterprise Ireland.

At the same time, Oakpark has recently completed a major capital investment in a second processing facility located in Clonmel.

Having acquired the facility in late 2017, Oakpark spent the next six months retrofitting and renovating the plant to bring it up to the BRC global food standard.

“We’ve developed the Clonmel facility to produce a completely new product for the company which
is turkey bacon,” says Brett. “The market for turkey bacon is small in Europe but it’s growing rapidly because it’s a low-fat, high-protein product that appeals to the health-conscious consumer,” he adds.

Turkey bacon, which is effectively strips of turkey cut in the style of a rasher, is hugely popular in the US. As part of his research into the product, Brett spent time in the US studying the turkey bacon market and found that turkey bacon accounts for between 35% and 40% of total bacon sales in the entire US market.

The popularity of the product in the US, coupled with its attractiveness to health-conscious shoppers, convinced Brett turkey bacon could work in Europe. Since the start of this year, Oakpark has been producing turkey bacon from its Clonmel facility and has won customers in Ireland, the UK and the Netherlands.

**VOLUMES**

“We’ve only dipped our toe in the water with turkey bacon but it’s so far so good. The volumes aren’t huge to start out with but the early feedback from consumers has been encouraging,” says Brett.

The biggest part of the capital investment into the new facility was buying the processing technology required to make turkey bacon.

“The equipment required to produce turkey bacon had to be sourced from the US and Canada. It required a significant investment but Enterprise Ireland really supported our plans and was able to assist us with capital grants on the new equipment,” he adds.

The biggest advantage of the investment at Clonmel is that it leaves Oakpark with the option to look at producing other white meat and turkey products down the line as opportunities present themselves.

While bacon and rashers are still the core business for Oakpark, it’s remarkable how much the business has been able to diversify its product range in a very short period.

Since the Brexit vote in 2016, the company has expanded into streaky bacon and lardons aimed at customers in Germany, the Netherlands and Belgium, while at the same time it has taken its first steps into the white meat category with its turkey bacon offering.

It just goes to prove, there are always opportunities to be found in challenging times.
By 2013, husband-and-wife team Jimmy and Rosie McLoughlin could see that their business had a problem. Growth was slowing. After more than 15 years of sales growth, it became apparent that their family-owned business, Rosie & Jim, had reached a point where winning new customers was proving difficult. “We had reached a level where the business was starting to plateau,” says Jimmy McLoughlin, chief executive of Rosie & Jim. “Since we started out in 1997, the business had experienced growth every year. But we could see that growth was slowing and finding new customers was becoming a challenge,” he adds.

Run by McLoughlin and his wife Rosie, Rosie & Jim produces breaded chicken products such as goujons, strips and kievs for supply to restaurants and butcher shops all across Ireland. “Our business was mainly supplying butcher shops with our range of breaded chicken products. But there are only so many butchers in the country and we were in practically all of them,” says McLoughlin.

“It’s very hard to get into foodservice because those companies mainly use breaded chicken from Thailand and Brazil. And getting supermarket listings for your products was also very difficult because of a perception that we didn’t have enough point of difference from any other breaded chicken product,” he adds.

GROWTH

To reset the business on a growth trajectory once more, the McLoughlins took a bold step which carried significant risks for the business that they had built together. Rosie & Jim would transition to a manufacturer of gluten-free chicken products. “We had enough customers enquiring if we could make a gluten-free version of our chicken products that we sensed a worthwhile gap in the market. Gluten-free meant huge changes for our business. It created a lot of challenges swapping the component ingredients of our breaded coatings for non-wheat ingredients,” says McLoughlin.

“Gluten acts as the glue. When you take it away, flours are much dustier and batter thins out much more quickly. The ability to bind carbohydrates to protein becomes far more complex and additionally coating equipment suddenly began to act up in ways it never did before,” he explains.

“But with 15 years of manufacturing experience under our belt and a highly skilled and experienced team behind us, we were able to overcome these challenges which justified our very significant capital investment. Our priority was that the taste and texture of our product could not suffer in this transition,” he adds.

On top of this, non-wheat ingredients are three times more expensive than standard wheat flours and batters. However, the McLoughlins were confident the move to gluten-free would propel the company’s sales to a new level.

As a client of Enterprise Ireland, Rosie & Jim was able to lean on the state agency for support during the transition to gluten-free. The company availed of a €200,000 R&D grant to help fund the project and has since drawn down €250,000 in capital funding for the extension of the production facility in Dublin 12.

The transition to 100% gluten-free took almost two years and created many challenges for the business but it is starting to yield results. Suddenly, Rosie & Jim is in high demand from both supermarkets and foodservice in Ireland and further afield because gluten-free has given the product range a real point of difference in these sectors.

“The move to gluten-free has opened a lot of doors for us. Supermarkets who never would have dealt with us are now very interested in our product because it’s got a real point of difference,” says McLoughlin.
Right now, the company’s range of gluten-free chicken products has listings with Dunnes Stores and SuperValu here in Ireland. The strategy is to build the Rosie & Jim brand of gluten-free chicken over time.

**EXPORTS**

At the same time, the company has also started building its export business. “Exports now account for 8% of the business and we’re very focused on building export sales,” says McLoughlin. “We’re doing quite a bit in the UK market at the moment but we could be doing so much more. With Brexit hanging over everyone, there’s a lot of nervousness among UK retailers and foodservice operators to take on new Irish suppliers,” he adds.

Outside of the UK market, McLoughlin says the company has well advanced export plans for Scandinavia, Germany, the Netherlands and Belgium. “The Scandinavian market should be a really good market for us. Gluten-free is a very popular consumer trend in those countries because they have a higher instance of coeliac disease,” says McLoughlin.

“Right now, we’re working on our supermarket packaging designs for the Scandinavian market. It will be an ideal first market outside of the UK. But we’re also working with an agent who has had big successes in Europe and we’re targeting winning new export business in Germany, the Netherlands and Belgium,” he says.

In time, McLoughlin believes export sales will grow to account for 50% of the business. Rosie & Jim is now producing 50t of breaded chicken products each week and has invested in the necessary extra capacity needed for future growth. Amidst all the change and expansion over recent years, the company has remained disciplined and closely monitors production costs. Since 2014, Rosie & Jim has been implementing lean principles across the business.

Working with Enterprise Ireland, the company achieved savings of almost €0.5m from 2014 to 2017 through the Lean Start and Lean Plus programmes. In 2018, Rosie & Jim started Lean Transform, which is Enterprise Ireland’s most advanced level of lean. Lean Transform is a large-scale and extensive transformation programme for the business but is significantly funded by Enterprise Ireland.
In May 2016, Abbey Machinery officially opened the doors on a brand new purpose-built manufacturing facility that would set the company up for continued expansion over the coming years. Situated on a 30ac site outside Toomevara, Co Tipperary, the 100,000 square foot facility represented a significant investment to the area, which is a remarkable achievement for a family-run business that is manufacturing agricultural machinery in Tipperary for more than 70 years.

Today, the company is led by Clodagh Kavanagh, who is the fifth generation of the Kavanagh family to work in the agricultural machinery space. The Kavanagh family’s links to making agricultural machinery can be traced as far back as the 19th century.

Abbey’s investment in the new manufacturing facility provided it with several new production lines but it was also fitted with class-leading manufacturing equipment such as enhanced laser and plasma-cutting facilities, semi-automated robotic welding and a state-of-the-art sand blasting and paint plant. It provided an extra 35% in warehouse capacity for Abbey’s Q Parts business, enabling increased levels of service to its global customer base.

The company’s product range is aimed to cater for the total cow, starting at the front of the cow, with Abbey manufacturing precision diet feeders, grass-toppers and fertiliser spreaders.

For the back-end of the cow, the company also produces a range of environmentally focused slurry spreading systems including tankers, muck spreaders and slurry agitators.

**LEAN**

Building a new manufacturing facility allowed Abbey to intensify its focus on lean manufacturing. According to Michael O’Grady, business development manager at Abbey, lean manufacturing techniques allows the company’s senior management team to critically analyse all areas of the business.

“Lean is at the core of what we do in Abbey. It is a continuous process of incremental improvements that allows us to improve process flow, manufacturing time, production costs and overall manufacturing efficiencies in the business,” says O’Grady. “It’s an ongoing process and there’s room for further improvement. If it’s not being measured it cannot be managed,” he adds.

The longevity of Abbey Machinery is testament to its ability to remain relevant to its farmer customers but also its continued investment in developing new technologies for the farmer. Every year, the company sinks up to €0.5m into research

Lorcan Allen speaks to Michael O’Grady, business development manager at Abbey Machinery, about how the Tipperary business invests in R&D
and development (R&D) work in order to have a continuous pipeline of new products. Earlier this year at the FTMTA Farm Machinery Show, Abbey showcased its new “Plus” range of diet feeders, which are aimed at larger-scale dairy and beef farmers, and have a capacity range of 24m³ to 30m³.

In 2017, the company launched a new door-mounted band spreader, which can be retrofitted to existing slurry tankers. This new band spreader places the slurry directly on to the soil, which the company says reduces ammonia emissions, improves nitrogen retention and reduces odours during the application process.

Market Discovery

With almost 60% of sales coming from export markets, maintaining competitiveness in the international market place is essential for Abbey. The company first began exporting machinery to Northern Ireland and the UK over 30 years ago but has since developed export markets in Scandinavia, central Europe, the Middle East, Australia, New Zealand, Asia and South Africa.

When exploring opportunities in new markets, Abbey works closely with Enterprise Ireland to carry out market research, understand threats early on, evaluate opportunities and help to develop market entry strategies with the right local partners.

“A key focus of growing the business is building sales into our existing export markets but also to new markets. We try to build strong relationships with the key players in these markets by looking at local needs and establishing a footprint on the ground,” says O’Grady.

In its established markets, the company says it is seeing increased demand from farmers for precision feeding technology and low-emission slurry applicators because of ever increasing environmental regulations and a drive to lower carbon emissions from farming.

“Our feeding systems can help reduce ammonia and methane emissions from the cow by mixing and chopping feed mixes in a way that allows the animal to absorb the maximum amount of nutrients from the feed, which minimises negative emissions,” says O’Grady.

“In the slurry side, our low-emission slurry applicators can place the slurry on or in the soil and significantly reduce ammonia emissions. Recent trial work carried out earlier this year by Teagasc in Johnstown Castle highlighted a near 80% higher growth rate in grass from our vertical trailing shoe tanker versus a splash plate. This highlights a win-win for both the farmer and the environment,” he adds.

At a time when climate change is leading to major changes for farming in Europe, Abbey’s investment in developing its range of low-emission slurry applicators and diet feeders is almost certain to pay dividends for the company in the years ahead as agricultural compliance rules and regulations evolve.
If you get in a car today and drive through Ireland’s dairy heartlands – be it Cork, Kilkenny or Tipperary – you will see herds of content dairy cows striding through lush green fields with their heads bowed as they graze on the country’s protein-rich grasslands.

It’s a familiar and natural sight, and one that has allowed Ireland’s dairy industry to build the iconic Kerrygold brand on the back of it. Consumers the world over, but particularly in Germany and the US, love the idea of Ireland’s grass-based dairy system and the natural butter we produce from that milk.

The process of dairy cows turning inedible cellulose such as grass into nutrient-dense proteins which humans can eat such as milk, butter and cheese is one that has stood the test of time because it is incredibly natural and straightforward.

Yet, for all its simplicity, the technology available to dairy farmers has never been more advanced. If you look closer at those fields of dairy cows in Cork, Kilkenny or Tipperary, you may see the odd herd wearing collars or some other type of electronic equipment.

**ESTABLISHED**

HerdInsights is an agri-tech company that designs such smart devices for cows. Founded in 2010, the company has developed a “smart collar” technology for dairy cows that improves heat detection in cows and reduces healthcare costs through early illness detection.

HerdInsights cloud-based smart collars detect oestrus (heat) in cows by monitoring the cows’ activity such as mounting and chin-resting behaviours, and also monitors cow health status by recording rumination, feeding and lying behaviour.

Like an Apple watch or any smart watch for humans, these collars are designed to collect data from the animal that can help the farmer make better management decisions for their herd of cows.

According to Brian Mulcahy, chief executive of HerdInsights, there are 270m dairy cows in the world today with roughly 80m of these cows wearing some form of electronic collar, whether that’s a simple product to activate feed systems in the milking parlour or a pedometer for the cow.

However, up to five million cows around the world wear collars that can detect heat and monitor health.

“The adoption rate of smart collars on dairy farms varies hugely, depending on the country you’re looking at,” says Mulcahy.

“In Germany, for instance, roughly 80% of all the dairy cows in the country are wearing some form of a smart collar. In New Zealand where there are 4m dairy cows and Australia where there are 1.6m dairy cows, between 20% and 30% of cows wear some form of a smart collar. In the US, you will see smart collars on dairy cows in one out of every 10 herds,” he adds.

In comparison, adoption rates of smart collar technology are very low.

“In Ireland, there are 1.4m dairy cows, but less than 100,000 cows are wearing smart collars. The adoption rate is still in single-digit figures here despite the benefits the technology can provide to farmers,” says Mulcahy.

One of the biggest reasons adoption rates of smart collars are so low in Ireland is simply competition
for capital on farms. The continued expansion of Ireland’s dairy sector, since the end of milk quotas in 2015, has forced farmers to invest significantly inside the farm gate in larger bulk tanks, new milk parlour systems, increased wintering and slurry capacity as well as greater feed storage.

According to Mulcahy, these are all “must-have” investments for the expanding dairy farmer whereas smart collars are seen as a “nice to have” technology.

TESTING GROUND
Despite the low adoption rates, Ireland has fine-tuned an excellent testing ground for HerdInsights to develop its technology, says Padraig Lynch, the company’s director of product and business development.

“We purposely finetuned our technology in Ireland as heat and illness detection is a lot harder on a grass-based system than it is in a confined system. You’ve got so many variables such as weather, distance and climate in a grass-based system, so we knew if we could crack the technology on the pasture system we could take it all over the world,” says Lynch.

In 2017, HerdInsight invested in its management team along with other resources. It began its international sales programme and has been quick to develop its target export markets. At present, HerdInsights smart collars are installed on dairy farms in 10 countries around the world, including the UK, the US, South Africa, Australia and New Zealand. A number of large-scale dairy farms in South America have also installed the technology, mainly to monitor herd health.

The company has also partnered with Waikato Milking Systems, the New Zealand milking parlour manufacturer with operations all over the world, to make white-label (own-label) smart collars for them. This partnership has largely driven the company’s growth in the US market but Lynch believes opportunities are there to target their branded smart collar system at smaller-scale family farms in certain parts of America. However, the US dairy industry is going through a very difficult period right now, with farmgate milk prices rooted to the floor. In parts of the Midwest, hundreds of farmers have left dairying behind them in the last year.

Business is tough in the US dairy sector but HerdInsights is making headway in other parts of the world. In the last year, the company has installed its smart collar systems on 10 dairy
farms in Germany, which is the largest dairy-producing member of the EU, pumping out over 31bn litres last year. According to Brian Mulcahy, Germany is a hugely competitive market but the company now has a toehold in the market it can build on.

COMPETITIVE

“With 80% of all the cows in Germany wearing some form of an electronic collar, it is obviously a very competitive marketplace,” says Mulcahy. “However, the response so far from German farmers has been very positive. They love the simplicity and ease of use of HerdInsights technology. Our system is very icon-rich so it’s easier to overcome language barriers,” he adds.

Since it launched its first commercial product, the HerdInsights team has worked closely with Enterprise Ireland to grow the business. Through Enterprise Ireland’s pathfinder programme, the company was able to carry out targeted market research for the German market, while also working with the state agency’s German office to develop routes to market in Germany.

“Enterprise Ireland has been with us every step of the way,” says Mulcahy. “Agri-tech is a really interesting and growing sector right now. Last year, we attended the Eurotier trade show in Germany as part of Enterprise Ireland’s stand. Eurotier is the single largest agricultural trade show in Europe and it allowed us to get in front of German customers,” he adds.

HerdInsights has since employed a full-time sales development manager in Germany to try to further develop the market. It will take time but the company has built its bridgehead into an enormous dairy sector where technology adoption on farms is world-leading. Could the Germans develop a love for Irish agri-tech similar to their love of Kerrygold? Time will tell.

HOW MANY COWS WEAR SMART COLLARS?

80%: GERMANY

UP TO 30%: NEW ZEALAND

10%: US

In Ireland, there are 1.4m dairy cows, but less than 100,000 cows are wearing smart collars.
Faced with the threat of Brexit, Ireland’s agri-food industry has been forced to diversify into new markets in a bid to lower the sector’s exposure to the UK market. Many companies have pivoted into new markets in Europe and further afield. While full diversification will be slow and take years, many Irish agri-food companies are finding exciting new opportunities in these markets.
On the surface, the rural village of Causeway in Co Kerry may seem like an out-of-the-way place to build a global engineering business. Yet it’s no surprise that Dairymaster, the family-owned milking technology company, has developed and thrived in this part of Ireland.

North Kerry is a dairy powerhouse. Just over 20km up the road is Listowel, the town where the global taste and nutrition giant Kerry Group established its first milk processing plant – a facility still going strong today.

Situated in this dairy farmer stronghold, Dairymaster has grown into a business exporting milking machines, bulk tanks, automated feeding systems and manure scrapers, as well as cutting-edge herd health monitoring devices to dairy farms all over the world.

Almost three-quarters of the group’s sales are generated in export markets, including the US, Japan, Russia and the UK. In Germany, Dairymaster has grown to account for 25% of the milking machine market.

With more than 4.3m dairy cows and 60,000 dairy farms, Germany is the largest milk-producing member state in the EU and has become the single most important market for Dairymaster in mainland Europe.

At the heart of the company’s success is a relenting focus on R&D and using new technology.

“Technology is at the heart of what we do,” says Edmond Harty, chief executive of Dairymaster.

“The question we ask ourselves continuously here is, what does technology allow us to do? I like to describe it as trying to build a better cake. We can take new ingredients such as machine learning, artificial intelligence (AI), connectivity and internet of things (IoT) to make our products more attractive to our customers,” he adds.

While connectivity means more real-time data is being collected from Irish farms than ever before, Harty says it’s no good unless your technology can run an analysis of that data and deliver useful...
management insights to the farmer that will allow for better decision-making.

**HERD MONITOR**

Dairymaster’s answer to this is the MooMonitor+, a herd health and fertility monitoring system which the cow wears around its neck.

“Our MooMonitor is taking about three million readings on each animal every day,” says Harty. “So that’s the level of data collection possible. However, our technology is then able to analyse all of that data, send it up to the cloud and send about 210,000 analysed readings for each animal every year. So connectivity is important but real-time data analytics is crucial to helping the farmer make the right management decisions for the herd,” he adds.

Testament to the group’s reputation for innovation, Dairymaster hosted a visit from Dr Juergen Voegele, head of agriculture at the World Bank, in 2014.

With a PhD in agriculture engineering from the University of Hohenheim in Germany, Dr Voegele was keen to learn first-hand about the innovation and R&D work at the Kerry-based company.

Dairymaster underlined its commitment to on-farm research in 2016 when it joined the €2.3m partnership at UCD Lyons dairy education and research farm. The company was one of seven Irish agribusinesses that backed the Lyons farm, which was established to investigate innovative models of milk production and educate young dairy farmers.

The Lyons dairy research farm was also supported to the tune of €1m from the Enterprise Ireland Innovation Partnership Project. All 200 cows on the Lyons Farm wear Dairymaster’s MooMonitor+ monitoring system, while the milking parlour is fitted with the company’s Swiftfilo Commander technology.

**INVESTMENT**

More recently, Dairymaster signed a €2m R&D partnership with the Institute of Technology Tralee, the Irish Software Research Centre, LERO, and Science Foundation Ireland. As part of this partnership, a team of researchers will be hired to work with LERO and Dairymaster R&D teams. These will include PhD students, scientists and engineers with backgrounds in embedded electronics, sensor technology, software development and data analytics. As part of the R&D programme, LERO and Dairymaster will look to develop autonomous systems to ease the workload on the dairy farm.

“The challenge of attracting people to work in farming is only getting harder,” says Harty. “It’s becoming increasingly difficult to find people who have the skills and the interests to work in agriculture. That’s why developing labour-saving technology is so essential for the future of farming,” he adds.

**AGRI-TECH ECOSYSTEM**

The presence of a global player in agri-technology and agri-engineering, such as Dairymaster in Co Kerry, is having a mushroom effect with an agri-tech ecosystem beginning to develop in the county.

In 2017, a new collaboration was announced between Dairymaster, McHale Engineering, Abbey Machinery, Kerry County Council and the Institute of Technology Tralee to develop an agri-tech centre of excellence, known as ACE, at the Institute of Technology Tralee.

This new centre of excellence for agri-tech R&D and training, which was co-funded by Enterprise Ireland under the regional development fund, will position Kerry as the national leader in agri-tech R&D, as well as enhancing the county’s reputation for agri-tech internationally.

Collaborations such as this are win-win for a company like Dairymaster. The company gets to work closely with research institutes to develop and trial new and emerging technologies, while it also provides an excellent pipeline of talent for the company into the future.

When viewed from a distance, an ecosystem of agri-tech innovation is emerging around Dairymaster and its global success story. It’s just another success story in the Kingdom.
In 2014, the Chinese government published a new report on the health of the country’s soils. The numbers were frightening. The report showed that almost one-fifth (19.4%) of China’s farmland was contaminated by organic and inorganic chemical pollutants, as well as heavy metals such as cadmium and arsenic.

For context, 20% of China’s farmland equates to just under 62m acres, which is an area three times the size of the island of Ireland. Any crops such as rice grown on this contaminated farmland will be poisoned and not fit for human consumption. Given that China is trying to feed one-fifth of the world’s population, its highly contaminated soils are a major concern.

However, new technology is emerging that could have a key role to play in solving this crisis and allow Chinese farmers to grow safe, high-yielding crops. Microgen Biotech, a startup company based out of the Institute of Technology Carlow and co-founded by Dr Xuemei Germaine, has developed a new biotechnology that can protect crops from heavy metals in soils.

According to Dr Germaine, who is the company CEO, Microgen Biotech has developed a range of plant growth promoting bacteria, or PGPB for short, which are tolerant to heavy metals and can protect plants against metal toxicity while at the same time
increase root length, improve nutrient uptake and boost yields by up to 10%.

Right now, Microgen has over 80 field trials ongoing in China where it is trialling its PGPR technology on rice crops growing in heavy metal-contaminated soil. So far, the company is finding its microbial products are resulting in a 30% to 40% reduction in Cadmium, which is a significant impact.

While China is the core market being targeted by Microgen, the company’s new microbial biotechnology has far reaching applications that will be of interest to farmers all over the world. After all, soils that are high in heavy metals is not just a Chinese problem but, rather, a global one.

In South America, cocoa farming is significant in countries such as Brazil, Ecuador, Peru and Colombia where a significant dark chocolate industry exists. However, in many of these countries, soils contaminated with cadmium is a major problem for farmers. The problem escalated significantly for South American cocoa farmers earlier this year when the European Union, which is a major importer of dark chocolate, announced very strict limits on the amount of cadmium in cocoa products.

Since January 2019, a 100g bar of dark chocolate containing more than 50% cocoa solids must not have more than 0.08mg of cadmium. Microgen has seized on this dilemma for South American farmers and is now trialling its technology in cocoa plants to help safeguard the crop from cadmium contamination.

FOUNDED
Microgen Biotech was founded in 2012 by Dr Germaine and a spin-out of IT Carlow. Prior to starting the company, Dr Germaine had completed a PhD in Environmental Biotechnology before joining Pfizer for a number of years.

In 2014, the company became a client of Enterprise Ireland’s after it received €50,000 in seed funding from the state agency’s startup fund in exchange for 10% of the equity in the business. Dr Germaine admits she had no business experience when starting the company but was able to avail of Enterprise Ireland’s new frontiers programme, which provided her with six months of business training.

A year later, in 2015, Microgen Biotech carried out its first significant funding round when it raised over €800,000 from private and public investors, including €250,000 in matched funding from Enterprise Ireland’s high potential startup (HPSU) fund.

Microgen Biotech is still a young company but its technology is enormously promising and has applications all over the world. With the world headed to 10bn people and more food needed than ever before, Microgen’s range of biotechnology products looks like an important development.

Right now, the company is seeking to raise a substantial $7m (€6.3m) in new capital from investors. However, given the exciting results already provided by the company’s range of biotechnology products, this latest funding round is sure to attract plenty of interest from agri-tech funds and investors in Dublin, Israel and the US.

While Microgen’s core focus is developing crop protection products through its biotechnology, it has also developed a range of products that can clean up polluted soils using microorganisms that degrade toxic substances. This process is known as environmental bioremediation.

The company was previously engaged by Greencore to carry out a commercial trial of this technology at the old sugar factory in Carlow town, where parts of the land have been contaminated following the decommissioning of the sugar plant. The trial at Greencore’s old sugar plant was successful with the soil decontaminated and the pH restored to a healthy level once more. Microgen has since signed another agreement with Greencore to carry out a second commercial trial at the Carlow site after another part of the old sugar factory was found to be contaminated.
If you ever find yourself in Texas in the springtime and are driving west along Interstate 10, chances are you might notice something strange. Every year, without fail, a great migration takes place along this road as convoys of trucks carry an unusual passenger west.

The destination for these trucks is the central valley of California. Their cargo are bees. Millions of bees. In total, more than 30bn bees are migrated to California every year from all over the US, but mostly from southern states such as Louisiana, Texas, Florida and Georgia.

The arrival of the bees in California is timed for the start of spring when millions of acres of almonds begin to flower. Without the bees pollinating the almond trees every year, the world would have no almonds as California accounts for 80% to 90% of global almond production.

Beekeepers all over the US rent their beehives to Californian almond growers every year for prices ranging from $200 to $250 per hive. With some beekeepers owning as many as 60,000 hives, you can see why they would be prepared to drive their bees 4,000km across the US every spring.

**Pollination**

And it’s not just Californian almonds that US beekeepers play a crucial role in pollinating. They also transport their beehives all across the US to wherever farmers need them, whether it’s to pollinate apples in Michigan, cranberries in Wisconsin or blueberries in Washington State.

The migration of bees around the US to pollinate fruit and nut crops has created a $1bn (€905m) industry. A study by Cornell University in 2012 estimated that pollinator bees contribute almost $20bn (€18bn) to US farm incomes because of all the crops they pollinate.

A Cork-based startup company has become a rising star after developing a new sensor technology to monitor the health of bees. **Lorcan Allen** speaks to Apis Protect CEO, Fiona Edwards Murphy.
It’s an amazing statistic that shows just how reliant farmers will always be on nature despite the ever greater advances in technology.

Interestingly, an Irish agri-tech startup company based in Cork is looking to tap into the global pollinator bee industry with a new technology that will allow beekeepers to monitor the health and activity of their bees like never before.

Founded in 2017, Apis Protect uses sensor technology to collect data from inside the bee hive for a number of readings, including temperature, humidity, CO2 levels, sound and movement.

Dr Fiona Edwards Murphy, CEO at Apis Protect and one of the company’s co-founders, says the technology is providing beekeepers with a level of data they never had before, which in turn lets them make more informed management decisions.

“What we’re doing with this technology is trying to understand all of the conditions inside the hive,” says Edwards Murphy.

“Our technology is collecting all of these readings from inside the hive and is then using machine learning to analyse the data and compare it with other hives. The technology can then inform the beekeeper if they need to feed the hive, replace the queen bee, apply a treatment to the hive for pests or even split the hive in two if it’s grown too large,” she adds.

SENSOR TECHNOLOGY

As chief executive of the company, Edwards Murphy now finds herself immersed in the global bee pollination industry. However, her background is firmly in engineering, where she first developed a love for sensor technology.

“My background is in engineering, which I studied in University College Cork (UCC),” says Edwards Murphy. “I fell in love with sensor technology and all the different applications it had. The sensors could be applied to almost every sector,” she says.

As she explored options about a possible PhD in sensor applications, her supervisor in UCC suggested a study of the uses of sensor applications in beehives.

“My supervisor got the idea of using sensors in beehives because his dad was a beekeeper. I grew up in rural Kanturk, Co Cork, so I understood farming but beekeeping was new to me at the time,” says Edwards Murphy.

Since I started my PhD I’ve learned a huge amount about pollinator bees and the beekeeping industry, especially how important bees are to the global food system,” she adds.

After completing her PhD, Edward Murphy co-founded Apis Protect along with Dr Padraig Whelan of UCC and Andrew Wood, who previously worked for Accenture and Ernst & Young.

“Between the three of us we bring skills in engineering, science and business to the table of this company. It’s a really good mix,” says Edwards Murphy.

It’s still early days for the company but Apis Protect is monitoring the health of some 10m honey bees, having partnered with 20 host beekeepers in Europe and North America to trial the technology.

As the company installs its technology on more beehives around the world its data sets will continue to grow, which will in turn fuel the power of its machine-learning technology and improve its understanding of what’s actually happening inside the hive.

“We’re finding that large-scale beekeepers are very excited about our technology because it can help them identify problem hives with great accuracy. It can also tell the farmer when things are going wrong in the hive, which allows for informed decision-making in real time,” says Edwards Murphy.

INVESTMENT

In 2018, Apis Protect raised €1.5m in series A seed funding to help it develop to the next level. This series A funding round was led by Finistere, the US venture capital firm which has its European headquarters based in Ireland.

Dublin-based investment fund Atlantic Bridge also took part in the funding round, along with Yield Lab Europe and Radical Growth, an investment firm based out of California.

Enterprise Ireland invested €250,000 during this seed funding round through its Innovative HPSU fund, which targets matched funding at companies it believes are high potential start-ups (HPSU’s). These are typically companies which have the capacity to reach €1m in turnover and employ at least 10 employees over time. In addition, Enterprise Ireland’s overseas offices have helped Apis to develop new markets.

The next step for the Apis Protect is to commercially launch the business in spring 2020 ahead of the summer pollinator season. The company has set a target of instrumenting its technology inside 800,000 beehives around the world over the next five years.

It’s an ambitious target but the company has set its sights on cracking new markets around the world that are major producers of soft fruit and nuts. These markets include the US, Australia, New Zealand, South Africa, as well as countries in Mediterranean Europe. With the demand for food growing rapidly as the global population heads for 10bn by 2050, the pollinator bee will become more important than ever.
In the early 1950s, as Japan began to emerge from the devastation of World War II, Kiichiro Toyoda, the owner of the Toyota Motor Corporation, travelled to the US to see firsthand America’s model of mass production for automobiles.

Returning to Japan, Toyoda was determined his family company could grow to rival Henry Ford and the other US automotive giants.

However, he realised he could never replicate the mass production model of US car-makers as the supply of raw materials was very inconsistent in post-war Japan.

To overcome this challenge, Toyoda, along with a company engineer called Taiichi Ohno, developed a new system called the Toyota Production System (TPS). This new system was based on a “just in time” approach to manufacturing, where parts for assembly would arrive at the assembly line as they were needed.

The system also took inspiration from how US supermarkets handled inventory. Just like in a supermarket, Toyota workers would withdraw parts from a dedicated parts store in the car factory, which would be restocked as needed. In this way, the Toyota factory only manufactured car parts and inventory as the factory needed them and cut out excess waste in the manufacturing process.

The Toyota production system took more than a decade to implement but it would go on to have a wide ranging impact on global manufacturing such was its success.

Today, the system is more generally known as lean manufacturing and has been implemented across almost every industry in the world. Lean has even been implemented on dairy farms as a means of increasing efficiency in the milking parlour.

**LEAN MANUFACTURING**

For Aengus Lacey, marketing director at Carlow-based machinery manufacturer Tanco Autowrap, lean manufacturing has been a key part of his family’s company for many years now.

**Manufacturing the TOYOTA WAY**

Lorcan Allen sits down with Aengus Lacey from Tanco Autowrap to hear how the company has modelled its manufacturing system on that of global auto giant Toyota.
“We’ve been working on lean manufacturing in Tanco for many years now. About 12 years ago, we first started working with Richard Keegan and Enterprise Ireland around introducing lean principles into our manufacturing process,” says Lacey.

The lean programme that Enterprise Ireland offers to Irish businesses has three stages. The first stage is Lean Start, the second is Lean Plus and the most advanced stage is known as Lean Transform.

Tanco first engaged with Enterprise Ireland and started on its Lean Start programme. This early collaboration gave Lacey the opportunity to travel to Tokyo and visit a Toyota factory where he could see firsthand how their manufacturing process works.

“It was an incredibly interesting trip to actually visit a Toyota factory in Japan and learn directly from the company how its production process works,” says Lacey.

As a follow on from this, Lacey then travelled over to Toyota’s car assembly factory in north Wales for a more advanced introduction to lean. This involved a two-day workshop on everything from quality control of components to the distances that employees have to travel in between jobs in a manufacturing facility.

“We were there to try to learn from Toyota to see how could we reduce our batch sizes and improve our efficiency in terms of where people were moving in the factory,” says Lacey. “We were also looking to reduce manual handling and organise our inventory stores a lot better. It’s a basic system but it works very well,” he added.

**ROOT CAUSE**

More than anything, lean manufacturing boils down to identifying the root cause of a problem, according to Lacey.

“Lean is all about getting to the ‘why’ of what you are doing or the ‘why’ of a problem. It’s about identifying the root cause of a problem. If something fails or breaks down, you need to ask yourself what is the real cause of this problem. Too often, people just identify the obvious symptom but not the root cause,” says Lacey.

To illustrate how to properly identify root cause, the story of the Titanic is often used. When asked why the Titanic sank, most people would say because it hit an iceberg. But why did it hit the iceberg? Because it was travelling too fast. And why was it travelling too fast?

If you continue in this fashion and continue to ask why for each connected problem, you will eventually get to the root cause of why the Titanic sank, which was a decision that was made in the manufacturing process that the bulkhead needed to be lighter so the ship could travel faster.

“Instead of slowing down all the cruise liners on the oceans, ship manufacturers could simply increase the strength of a ships bulkhead,” says Lacey.

“Once you’ve identified the root cause of a problem you can take effective action to address it and not put a short-term plaster on the problem,” he adds.

“And that happens a huge amount in manufacturing where you see a symptom like a ram failure or if a seal has blown on a machine. People just ask the first why and are not getting to the real problem. I would say that root cause analysis has been the ultimate learning for me from lean principles,” says Lacey.

Exporting to many markets around the world, including North and South America, Australia, New Zealand and mainland Europe, Tanco needs to be as efficient a manufacturer as it possibly can be to compete successfully.

In important markets such as France, Germany, Austria and the UK, Tanco sells direct to dealers, which allows the company to receive direct feedback on any issues with its machines.

“This direct relationship allows us to ask those root cause questions of our customers when they have a problem with our machines. And that’s why Tanco machines are as reliable as they are,” says Lacey.
When you talk of bundles or a bundle offering, the first thing that springs to mind for most people is a sports and entertainment package with Sky TV or the latest deal from a phone and internet provider. However, for one Irish machinery company, the bundled sale has always been at the core of how it does business with farmer customers.

According to Matt Higgins, general manager of Carlow-based machinery manufacturer Keenan, the company has never just sold a steel machine to farmers. Instead, the company has sought to bundle services and nutrition advice with each sale.

"Keenan has always been a concept sale. This goes right back to the 1980s when we developed the first Easi-Feeder machine, which was the first of its kind in Europe," says Higgins. "We began offering nutrition support and advice to farmers alongside this machine. So it was very much a bundled product from the very early days and this has continued right through to our InTouch technology today," he adds.

EVOLUTION

In April 2016, the Keenan business was purchased by Alltech, the animal nutrition company privately owned by the Lyons family. Alltech’s acquisition of the business made sense as it brought a new level to the bundled offering that Keenan could sell to its customers.

According to Robbie Walker, chief executive of Keenan, there are four stages to the evolution of the Keenan business model.

"The first stage for Keenan was during the 1980s when the company sold an extremely well-engineered machine that farmers could rely on. The
second stage for the company came in the 1990s when Keenan began selling good nutritional advice alongside the machines,” says Walker.

“The third stage was combining the machine and the nutritional advice with digital technology. This gave the business much more control and improved our ability to offer advice to the farmer. Finally, the fourth stage for Keenan has been the acquisition by Alltech, which allowed us to combine the machine, the nutritional advice and the digital technology with actual nutrition from Alltech,” he adds.

Looking at the wider industry, Walker says you can already see that Irish manufacturers are having to evolve their business model to offer customers a bundle of services alongside the physical machine.

“True innovation in a company is also about innovating your business model, which for Keenan is about combining the machine to digital and nutrition. That’s where I believe the future of Irish manufacturing is going. Irish manufacturers are going to need to bundle services along with their product in the future,” says Walker.

R&D
Unsurprisingly, R&D and new product development are an important investment for Keenan. In 2017, Keenan announced it was appointing Michael Carbery as the company’s new head of innovation to focus on developing its R&D pipeline.

The company looks at its innovation pipeline from two sides: engineering and digital.

“On the engineering side, it is vital we continue to innovate because any engineering company will not survive without innovation,” says Walker. “Farmers in technologically advanced countries such as Germany and Denmark, where we have very strong sales, are already starting to adopt robotics and technologically advanced ways of feeding. As a result, we’re having to imagine what the robotic future would look like,” he adds.

While Ireland is at the forefront of digital innovation, thanks to the many US tech giants here in Ireland such as Microsoft and Google, the country is a bit behind when it comes to the latest robotic technology.

“The latest robotics technology is not here in Ireland so we’re looking to collaborate with companies outside of Ireland that have developed the technology we need and fast-track any new product development,” says Higgins.

“For example, the self-propelled feeder we launched in 2017 was a result of a collaboration with Storti, an Italian company. That collaboration allowed us to bring a proven-product to market very, very quickly,” he adds.

On the digital side, it’s all about data or, more precisely, the analysis of data collected on farms. Keenan’s feed management platform, InTouch, was first launched in 2015 and the company is now looking at the next stage for the software programme.

InTouch recently went through the Alltech Pearse Lyons accelerator programme this year and that produced two new ideas for InTouch,” says Walker. “This first is a second-generation platform called InTouch 2.0, which is really just a software and hardware update for the InTouch system. The second idea is a new concept called InTouch Go, which will be an evolution of the current system. It’s early days but Alltech has entered this new concept at the Innovation Arena run by Enterprise Ireland at this year’s Ploughing,” he adds.

LEAN
Since acquiring the Keenan business in 2016, Alltech was quick to reaffirm its commitment to continuing manufacturing Keenan diet feeders in Borris, Co Carlow, where the company employs around 110 people.

While Ireland is undoubtedly a high-cost economy for manufacturing, the company works with Enterprise Ireland to implement lean manufacturing principles across the business in order to improve efficiencies in the plant and eliminate waste.

“Lean is something that needs to be consistently worked on in a business. It’s about standardising what people are doing, reducing inventory levels and eliminating waste in your business,” says Higgins.

Interestingly, Keenan has now begun to evolve its interpretation of lean principles to how it interacts with customers.

“Lean made a big impact on the Keenan business but it was initially done on just the manufacturing process. Right now, we’re looking at the customer journey and the inputs to the factory,” says Walker.

“That’s basically how we receive our orders from customers, how this information is then passed through to the factory and how we place orders for parts to meet the specifications of each machine. We’re evolving lean from the engineering process to also include the customer experience,” he adds.

FUTURE
The growing focus on the carbon emissions produced from animal agriculture presents opportunities for companies such as Keenan that are focused on precision agriculture, or getting more from less. The company was recently carbon accredited by the Carbon Trust in the UK.

“The Keenan diet feeder and controller is now seen as a technology that can reduce carbon emissions on farms,” says Walker.

Keenan machines are now seen as a technology that can reduce carbon emissions on farms. We’re taking a mechanical, digital and nutritional approach to reducing carbon emissions,” he adds.
JFC Agri has built a reputation of continuous innovation. Lorcan Allen profiles the company’s latest innovations to help farmers reduce their workload around calving.
nutrition group, was an early customer for JFC Agri when it placed a large-scale order for 4,500 buckets. This was a major deal for JFC Agri at the time and Concannon still has the order docket from the sale, such was its significance.

Fast-forward to today and JFC Agri has targeted sales to reach €100m by 2020 with the company selling products into 65 international markets. The group has manufacturing facilities in Ireland, the UK, the Netherlands and Poland, and employs more than 350 people.

INNOVATION
Right from the beginning, JFC Agri has been synonymous with innovation. The company spends anywhere in the region of €700,000 to €1m every year on research and development of new products.

JFC Agri has targeted sales to reach €100m by 2020 with the company selling products into 40 international markets.

However, since the Brexit vote in 2016, the company has increased its R&D spend significantly in a bid to develop new products with a worldwide appeal. At the 2018 National Ploughing Championships in Tullamore, JFC Agri entered an important new product at the Innovation Arena run by Enterprise Ireland – an automated calf feeder.

Following three years of work by the group’s dedicated R&D team and intensive on-farm trials, JFC Agri launched the Evolution automatic calf feeder last year, which can be programmed by one person to feed 140 calves.

Finding people with the necessary skills and interests in agriculture is becoming an increasing challenge on farms all over the world. To counteract this and solve a major problem for many dairy farmers all over the world, JFC Agri’s automated calf feeder uses micro-chip technology in the calf’s ear tag to ensure each calf gets the correct amount of milk every day. The system will recognise individual calves and alert the farmer if the calf is not feeding and may be sick or need further attention.

During the three-year R&D phase it took to develop its Evolution automatic calf feeder, JFC Agri worked closely with Enterprise Ireland, receiving R&D grants and supports from the state agency to develop the new technology.

The company believes this new system will be a game-changer for its agri division. In the past year, JFC Agri has expanded its 100,000sq ft manufacturing site at Tuam to create a new and dedicated facility to manufacturing the Evolution automatic calf feeder. “This is a major technological leap for an Irish firm to be manufacturing an automated calf feeder as sophisticated, yet as easy for one person to operate, as this one,” said Concannon.

DIVERSIFICATION
While JFC Agri started out in agriculture, the company has since diversified into multiple sectors. Today, JFC Agri manufactures plastics solutions that are used in a wide range of sectors including construction, civil engineering, material handling and even the marine sector.

However, agriculture still remains a core part of this family-owned business and the sector will continue to drive growth for JFC Agri. The company’s ability to continuously innovate and marry new technologies with plastic solutions is keeping JFC Agri firmly on the growth trajectory.
Enterprise Ireland’s food innovation supports helped BFree to research an alternative to gluten in bread, allowing them to break into new product categories and markets.

Right now, we have a new range of supports and programmes to help companies in the food sector respond to challenges like Brexit and develop new market opportunities.

For details of our full range of food innovation supports, visit globalambition.ie/innovation

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