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43/ 2022

MEATING POINT magazine

SUSTAINABLE TECHNOLOGY, PROCESSING & PACKAGING

MEAT THE INNOVATIONS

IFFA

14. – 19.5.2022
Frankfurt am Main

THE BARLEY PROTEIN BREWING STORY

ALTERNATIVE PROTEINS - DEVELOPMENT AND AVAILABILITY

ROBOTS SHARPEN THE BUTCHER'S KNIFE


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Dear reader,


Jenny Smart

From May 14 to 19, 2022, IFFA, the Leading International Trade Fair - Technology for Meat and Alternative Proteins, will open its doors in Frankfurt am Main. Internationally renown companies will present their latest technologies and provide information on the most important trends and developments in the meat and protein processing industry.

One of the major topics at IFFA is sustainability: the European Green Deal, with the primary goal of becoming climate neutral by 2050, places high demands on the meat processing and packaging industry in terms of sustainability. A key question is how can energy and resource efficiency be increased? Machine manufacturers are presenting current solutions and best practices as well as efficient technologies to demonstrate their achievements in their sustainability goals. It's all about enabling new solutions and business models that are balanced with economic concerns while striving for the highest standards of social and environmental performance.

In terms of packaging, the reduction of packaging and the use of recyclable or biodegradable materials play an important role in waste management. In addition to the issue of recyclability, research is focusing on renewable raw materials. Algae-based plastics and transparent films, made from hemp or cardboard made from grass, bio-based packing provides an alternative to plastic made from fossil raw materials.

Eating habits as a whole are also changing: the demand for alternative proteins obtained from plants, insects, or cultured meat is increasing worldwide. Plant-based and clean meat ease food's impacts on land use and climate change and eliminate the spread of pollution and disease from concentrated animal wastes. At least 200 of the around 900 exhibitors will present products for this sector.

Along with the sustainability focus of IFFA 2022 automation, digitalization, food safety, food trends, and individualization are also among the top themes. Find out what sustainability practices are in place in the industry and some of the show highlights in our IFFA review section.

Enjoy your read!

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- Skin and Whole Muscle Packaging Trends

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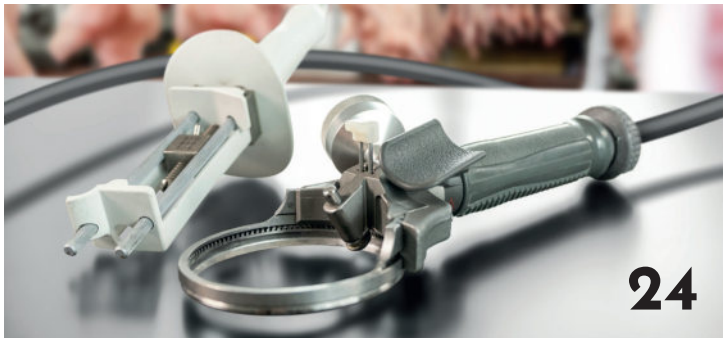

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IFFA – THE SECTOR HIGHLIGHT FOR INNOVATIONS, TRENDS AND ENCOUNTERS

The sector is set to meet at IFFA in Frankfurt am Main from 14 to 19 May. Around 900 exhibitors from more than 40 countries will be showing their latest products and solutions for processing, packaging and selling meat and alternative sources of protein. The companies are looking forward to personal encounters with their customers and to presenting the complete spectrum of their innovations from the last three years.

The expectations of the global meat and protein industry on their leading international trade fair – IFFA, Technology for Meat and Alternative Proteins – are high. From 14 to 19 May, the who's who of the sector will meet in Frankfurt am Main to present the latest innovations, to gather information and to network. Around 900 exhibitors from over 40 countries have registered to show their developments from the last three years including technology for processing and packaging meat and alternative protein products, ingredients and additives for modern foodstuffs, as well as new sales products. Everything and everyone of note will be spread over some 116,000 square metres of exhibition space (gross) in Halls 8, 9, 11 and 12 of Frankfurt Fair and Exhibition Centre. The traditionally high level of internationality of IFFA is also guaranteed this year with over 60 percent of registered companies coming from outside Germany, especially Italy, Spain, the Netherlands, Austria, Switzerland and Poland.

Trade visitors are also looking forward to this year's IFFA in Frankfurt. They come from the food industry, the butchers' trade, the retail trade, the hospitality industry and suppliers, and hold the fair in high regard as the best source of information for the latest innovations and trends. Wolfgang Marzin, President and Chief Executive Officer of Messe Frankfurt, says, "We are ready to welcome important players from the German and international meat and protein industry to IFFA 2022. Around 900 companies, including the market leaders, will be there and show the latest innovations on their impressive exhibition stands. The breadth and depth of the products and services to be seen is unrivalled and, this year, will once again generate a multitude of innovative impulses. With the new theme of alternative sources of protein, IFFA, the world's leading trade fair for the industry, not only sets the trend but also reflects current consumer behaviour."

The sector Banking on Personal Encounters

Preliminary data indicates that the production of food and packaging machinery in Germany increased in 2021 and sector sales almost reached the pre-crisis level of 2019. This positive background will also impact on the coming IFFA with the exhibitors looking forward to personal encounters with their national and international customers. Richard Clemens, Managing Director of the VDMA Food Processing and Packaging

Machinery Association, says, "Leading international trade fairs in Germany represent a home match and are very important for the mechanical-engineering sector. As we have seen clearly over the last two years, nothing can replace trade fairs as platforms for innovations, the exchange of ideas and information and progress. Our member companies are looking forward to this opportunity to present their solutions in the fields of automation, digitalisation and sustainability, as well as, naturally, to personal encounters, conversations and discussions with experts from all over the world". The butchers' trade, one of the most important groups of visitors to IFFA is also looking forward to the fair with great anticipation. A poll of members of the German Butchers' Association (DFV) revealed that slightly more than 50 percent of artisanal butchers are planning above-average investments for 2022, particularly in production, sales and energy efficiency. DFV president Herbert Dohrmann says, "All in all, our polls indicate that the sector has come through the crisis very well and, as the figures clearly show, butchers are currently distinguished by a high propensity to invest. We are a personnel-intensive business and are hoping that IFFA will generate a host of important impulses, especially in the fields of automation and digitalisation."

For the first time in its history of over 70 years, IFFA has expanded its product nomenclature and now includes technologies and solutions for vegetable-based meat substitutes and alternative proteins. At least 200 IFFA exhibitors offer products for the production of meat alternatives. They are spread across the whole fair and can be found via the IFFA Contactor, the fair's exhibitor and product search engine. Additionally, the complementary programme of events will provide further information about this future-oriented subject. New IFFA partners, such as the German Association for Alternative Sources of Protein (BALPro), the Good Food Institute Europe and the ProVeg nutritional organisation, will also be contributing their expertise and their networks.

The Programme of Events: Inspiration, Product Information, Expert Knowledge and Insights

The IFFA programme of events will give participants the opportunity to see and experience innovations, to take part in lectures and discussions and to gain inspiration for new products and solutions. Throughout the fair, the IFFA Forum will be the setting for expert talks and product presentations. Every day, the spotlight will be on a different top theme, i.e., automation, digitalisation, food safety, sustainability, food trends and individualisation in artisanal businesses. New and also live daily, vegan and meat-based bratwurst will be produced on the genuine production line of the IFFA Factory while experts explain the production methods and provide information about recipes, ingredients and processes. Also new are the guided tours to selected exhibitors. Each of these Discovery Tours will focus on a specific theme. The choice ranges from packaging trends and process innovations to meat substitutes (presented by the Good Food Institute Europe), ingredients and 'Trends in the Butchers' Trade (presented by the DFV). Great product inspiration will once again be offered by the international product competitions and competitions for young members of the German Butchers' Association. The National Butchers' Trade Team will also be represented and there will be exciting insights to be gleaned from the 'Artisanal Art' special show.

The VDMA is joining forces with the Fraunhofer Institute for Process Engineering and Packaging to present future-oriented themes and solutions on its exhibition stand. Visitors will be able to see a virtual cleaning assistant for safe and efficient manual cleaning with the aid of augmented reality technology. The second main theme revolves around alternative proteins and focuses on processes for the fully automatic production of insect protein and plant-based protein.

New: IFFA Digital Extension

For the first time, IFFA will be held with a digital extension and thus open up new dimensions for visitors to make their trade-fair experience even more individual or to participate when it is impossible to travel to Frankfurt. The new digital platform includes a variety of exciting options before, during and after the fair. For example, visitors can make contact with potential business partners and arrange mutually convenient appointments in advance via the matchmaking system. Detailed product information and corporate profiles of the exhibitors in word, photos and video offer a good impression of the product ranges while chat functions and video calls mean making direct contact is easy.

www.iffa.messefrankfurt.com

GEA FOCUSES ON DIGITALIZATION, SUSTAINABILITY AND APPLICATION EXCELLENCE

GEA, a global player in the food industry, will showcase its most recent food processing, freezing and packaging innovations, which bring important benefits in sustainability, digitalization, product quality and productivity. Outstanding application excellence in the fields of poultry, other meat and plant-based foods will also be key topics. GEA is dedicated to offering comprehensive technological solutions that equip its customers today for the challenges of tomorrow.

GEA will showcase digital excellence at IFFA - including a fully automated slicing and packaging line for calibrated products that uses recyclable mono-material film. The line comes up with numerous innovations.

Digital Empowerment

To showcase its strong technological offering at IFFA, GEA will exhibit a complete, fully automated, slicing and packaging line for calibrated products that uses recyclable mono-material film. This 24-meter-long line includes the GEA OptiSlicer 6000, a newly integrated robot loading function, the PowerPak PLUS thermoformer with new and unique heating, evacuation and gas injection systems, the new TiroLabel PLUS labeling equipment and a new, end-of-line converger system developed by GEA.

Critical equipment is digitally enhanced by the new GEA SmartControl HMI (Human-Machine-Interface) platform, which offers easy operation based on user roles, increased process safety through version control and logs, access to historic data, and open interface integration with other line equipment. The slice-pack line at the exhibit will also demonstrate GEA LineControl, a digital management platform which can automatically orchestrate the process across the entire line based on pre-programmed scenarios. This feature increases safety while reducing downtime, rework and waste of energy and resources, ultimately enabling food processors to work more efficiently and deliver better quality products.

The innovative, digital GEA SmartControl HMI (Human-Machine Interface) platform is also new. It offers easy operation through different operator profiles and increases process reliability.

Condition Monitoring System Predicts the Future

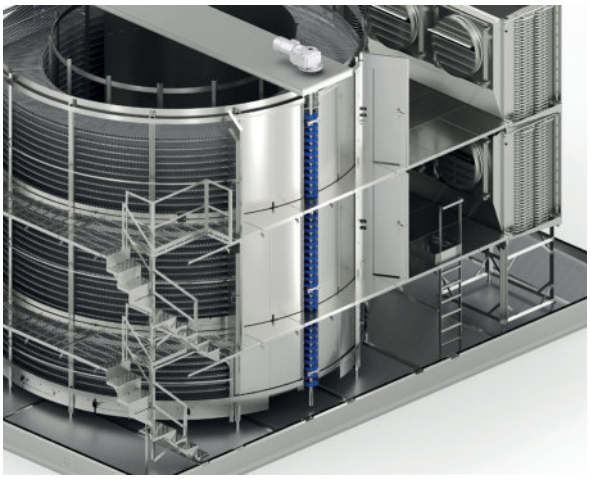
At IFFA, the slicing and packaging line will be connected to a condition monitoring system, part of the GEA PerformancePLUS service program, continuously tracking in real time the performance and condition of the line in general and each machine in detail. This digital solution prompts the user when the equipment needs maintenance, service or repair, and provides real-data insights on how to improve daily operations

to prolong the system's lifespan and productivity. In addition, this condition monitoring system will also be available on the newest, third generation bowl cutter – the GEA CutMaster GEN 3, debuting at the IFFA. The new bowl cutter features various technical improvements related to hygiene, productivity, ease of use and line integration, enabling reliable and versatile production of plant and meat-based applications.

Third generation bowl cutter – the GEA CutMaster GEN 3, debuting at the IFFA, features various technical improvements related to hygiene, productivity, ease of use and line integration, enabling reliable and versatile production of plant and meat-based applications.

Sustainability by Design

GEA is presenting various technological improvements driven by concern for the environment. The new ProEdge Drive spiral freezer system embraces the "less is more" drum-free design. It boasts 12 percent greater freezing capacity within the same footprint while using less stainless steel. In vertical packaging, the acclaimed GEA SmartPacker CX400 with hygienic design will be equipped with an innovative Smart Sealing system featuring recyclable sealing strips with a substantially longer lifespan than any other technology currently on the market. In addition to mono-PE materials, the GEA Smart Sealing System is ideal for a wide variety of laminates, including many recyclable materials such as paper laminates. In particular, the GEA PowerPak PLUS with its latest innovations, such as the new evacuation and gas injection system and the revolutionary new film heating systems, offers the ideal conditions for the use of extremely thin packaging materials or the use of mono-materials as well as paper-based packaging materials.



The new GEA ProEdge Drive spiral freezer system embraces the "less is more" drum-free design. It boasts 12 percent greater freezing capacity within the same footprint while using less stainless steel.

Smart Cooking Technology

As demand grows for more efficient and sustainable food production methods, the latest industrial cooking technology in the GEA CookStar GEN 3 spiral ovens has the potential to transform the mass production of roasted, breaded and smoked products. These new high-performance ovens are extremely accurate and offer more creative cooking options while giving the food industry what it wants: increased yields, improved sustainability and high-quality products.

Application Excellence for Plant-Based and Meat-Based Foods

As a global leader in food processing technology, GEA offers full application expertise that empowers food producers to turn their ideas into reality. Success depends not only on having the right equipment, but also on having the expertise to innovate, scale up, and safeguard product quality and yield. At IFFA, GEA will present solutions for plant-based nuggets, burgers and fillets as well as complete line solutions for ham, innovative in-line smoking lines for bacon and poultry, and much more.

www.gea.com

IFFA Hall 8 Stand G20

ROBOTS SHARPEN THE BUTCHER'S KNIFE

In the future, all cutting processes in slaughterhouses may be taken over by robots. Danish Meat Research Institute (DMRI) at Danish Technological Institute has designed and developed a robot cell that can handle six different cuts of pig.

Haiyan Wu, Section Leader, Danish Technological Institute, works with the development of artificial intelligence for controlling slaughterhouse robots based on vision images, as seen on the screen.

In 10 years, slaughterhouses can be close to fully automated - in a scenario where robots have taken over the slaughterhouse workers' manual cutting and slicing of the meat.

"If we leave out the economic aspect, which of course you cannot do in the real world, then I estimate that in 10 years there will be technologies available that can make the slaughterhouses almost fully automatic. This assessment is based, among other things, on the progress we have made in our recent projects with the development of robot cells, which can now carry out six different cuts of pigs. When it comes to AI - based on neural networks and pattern recognition - we must conclude that our progress has gone much further than we had expected in advance," says Niels-Henrik Grothe, Head of automation at DMRI, that is part of Danish Technological Institute.

But the automation of slaughter processes began back in the 1960s.

"At the time, the mechanization and automation of the slaughterhouses was connected to an attempt to remain competitive. The Danish slaughterhouses and our predecessor Slagteriernes Forskningsinstitut initiated a systematic investment in automation, and during the 1990s they had come a long way. The entire first part of the process at the slaughterhouses was almost fully automated. But we also had to acknowledge that our development projects at the time were often so prolonged that they were overtaken by reality. We experienced spending several years developing fairly advanced deboning solutions, but when they were ready, the slaughterhouses chose instead to send the pigs for deboning in Eastern Europe due to lower wages. Therefore, we had to change strategy, and today we are aiming at significantly shorter development processes, so we do not run the same risk of being overtaken," says Niels-Henrik Grothe.

Now, Danish Technological Institute is developing early automation prototypes and then getting system developers and integrators on board.

"We try to align expectations with the commercial players by examining whether the integrator has an interest in product maturation of our solutions, and whether the slaughterhouse industry believes that they can work with the integrator in question. We know from experience that the commercial partners always modify our solutions to their own concepts, so we must not try to develop completely finished solutions, but simply demonstrate that a given technology and prototype works in practice," says Niels-Henrik Grothe.

Globally Leading Suppliers

Over time, the development projects at Danish Technological Institute have helped to create a breeding ground for an undergrowth of companies and suppliers of technological solutions for slaughterhouses and the food industry.

"Several companies have built their business on technology developed by DMRI, so we want to take some of the credit for Danish companies today being among the

global leaders when it comes to automation solutions for the food industry," says Niels-Henrik Grothe.

As part of the ACMP project - Augmented Cellular Meat Production - Danish Technological Institute has now developed a robot cell that can carry out six different work processes with a split pig carcass. A split pig carcass is a half pig from which the intestines and leaf fat are removed.

"As early as the 1990s, we automated the slaughter process itself, and we developed a primal cutting machine that cuts the pig into pieces and removes excess bones. The automation also includes cutting the middle back and carving out the roast pork and spare ribs. But since then, it has been difficult to move forward due to cost competition from the Eastern European countries. But now, with the results from the ACMP project, we may be able to move forward towards increased automation of more cutting and slicing processes," says Niels-Henrik Grothe.

The "Family Silver" Remelted

With the ACMP project, Danish Technological Institute has tried to think outside the box.

"Danish slaughterhouses are already very efficient, so we have to go "far up the tree" to chase margins that can bring costs down. Initially in the project, we did a 1-year workshop with all the key players in the industry and could then describe some scenarios for the development of meat producers and slaughterhouses," Niels-Henrik Grothe continues.
In the workshop, there were some future trends that emerged: Demands for a larger product mix with many customized products, which in turn will require high flexibility at meat producers and slaughterhouses - with demands for a high level of uptime and operational efficiency.

"We looked at the metal and car industries, which began to leave in-line production and switch to cell-based production more than 30 years ago. Historically, slaughterhouses have been 100 percent in-line-built. In fact, Ford carved out its concept for assembly line production of cars from slaughterhouses in its day. Leaving the in-line at slaughterhouses is equivalent to "melting the family silver," says Niels-Henrik Grothe.

In-line production is vulnerable and time consuming: If a link in the line fails, all production on that line stops. In addition, time is spent moving the item through the processes on the line.

"The car industry has invested billions and billions in cell-based production, and there is, of course, a reason for that. Now we are trying to use their experiences to rethink and automate the processes of the slaughterhouses. With cell-based processes, you achieve a number of advantages: You can carry out several simultaneous processes on your item, you save time because the item does not have to be moved along the line, and you reduce grip and release functions," says Niels-Henrik Grothe.

Eventually, robots may also be able to increase the time and resources that the slaughterhouses are available for actual production. Presently, six to eight hours are spent every day cleaning and drying out the slaughterhouses. "If the primary cleaning takes place inside a closed robot cell, you do not necessarily have to clean the entire slaughterhouse once a day, but can simply clean the robot cell itself, while other cells continue to run in the meantime," says Niels-Henrik Grothe.

The development team monitors experiments with robot-based tripartition of a pig.

98 Percent Accuracy

The newly developed robot cell consists of three robots and nine cameras,

and the cell is capable of performing six types of cutting of a split pig.

"We now have a prototype that can cut off ears, head, hind toes and stick wounds, remove the tenderloin and slice it into three pieces. Among other things, the robot has learned to identify the front toes and cut in the middle of a joint. There are nine cameras looking at the pig, and the robot can cut with 98 percent accuracy, which is better than a human operator. The robot can work simultaneously at both ends of the pig. A large robot takes the tenderloin out, while two small robots cut toes, ears, and slice off the head. The big question now is, how hard can we push the robot? How many pigs can it handle when we go to automatic feeding," says Niels-Henrik Grothe.

In the future, the technological development of slaughterhouses will most likely be determined by the best algorithms.

"In the ACMP project, we have seen how powerful AI can be. Initially, we had laid out a plan B where the pig was to lie in a fixture, but it did not become necessary at all, as the pig's own weight is enough for it to remain lying still during the robot cutting. No matter how the pig lies on the table, the robots have achieved millimeter precision during cutting. This is done by the algorithm having trained on the pig's anatomy by image recognition. The result is that we can just put the pig on the table, and then the robots start cutting," says Niels-Henrik Grothe.

Proficient Algorithms

Another positive achievement is the training of the algorithm that has happened with a very small number of images.

"Everyone can do AI with enough data, but the goal is to achieve sufficient recognition with as little image material as possible, so you do not have to use 10,000 images to reach a sufficient level. As a result, we have come all the way down to 50-100 images to get a running algorithm. It has been a great positive surprise and gives hope to the future AI solutions for the slaughterhouses," says Niels-Henrik Grothe.

On a regular basis, he has met with union members whose workplaces will be affected by the increased automation.

"So far, the slaughterhouse workers are positive partners. They want to be a future part of their profession. No one can say how many jobs will be left at the slaughterhouses when automation takes full effect. There will still be a need for employees at some level, but in the future job functions you will have the role of a robot operator. So, you should be keen to work with robot technology," says Niels-Henrik Grothe.

The new robot cell technology for slaughterhouses was patented in 2020, and Danish Crown is considering whether to acquire the technology and develop it to an industrial scale.

"Now, it is up to the industry whether they want to move forward with our prototype. It will require a major investment to get it ready for real production. We can run about 50 pigs through the robot cell a day, but to get up to full scale, it must be able to handle a daily load of hundreds of pigs with automatic feeding. Danish Crown has publicly announced that they want to invest in increased automation, so we are excited to see if our new robot cell will stand the test at a slaughterhouse," says Niels-Henrik Grothe.

He points out that the slaughterhouse industry already is a technologically advanced environment.

"Make no mistake, the slaughterhouse industry is becoming high-tech. Danish slaughterhouses are already world leaders, and now the technological level is becoming even higher. There are not many industries where you are allowed to work with this degree of the newest technologies," says Niels-Henrik Grothe.

www.dti.dk

IFFA Hall 9.1 Stand E40

Sustainable packaging solutions for the Meat & Poultry industry

Sustainability | Hygiene | Performance | Easiness

At IFFA, IMA Ilapak, the leader in vertical and horizontal packaging machines for flexible films, will introduce new solutions that enable fresh and frozen meat and poultry producers to package their products more sustainably without compromising on line speed, presentation or shelf-life. As well as demonstrating how processors can down-gauge material usage by 30-50% by switching from thermoforming to flow wrapping, IMA Ilapak will present its capabilities in running fully recyclable paper-based and mono-polymer films.

The VFFS line for IQF meat on display at IFFA

Visit us at IFFA

14-19 May 2022 | Hall 11 – Stand B59 | Frankfurt, Germany

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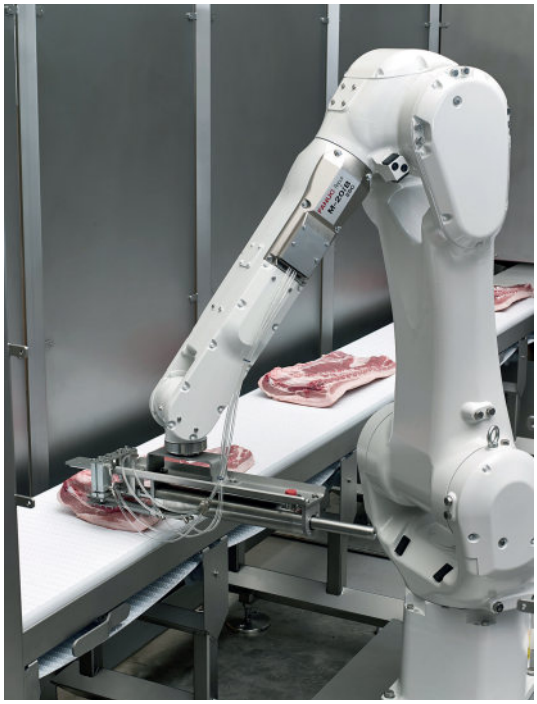
IMA ILAPAK

FRONTMATEC TO FOCUS ON DIGITIZATION, AUTOMATION AND INTEGRATION



Frontmatec offer, with locations in Europe, America, and Asia, complete concepts and turnkey solutions for the international food industry and is especially well known for its high-quality systems for the entire value chain of the meat industry – from carcass grading, slaughter lines, cutting and deboning lines, hygiene systems and control systems to logistics and packaging, all unique solutions, that create considerable value for customers.

Visitors to the Frontmatec booth will be presented with the latest equipment and solutions from the Frontmatec group. On display will be our latest innovations, including a range of robots for both dressing line and cutting & deboning, a new beef grading instrument, and new deboning and trimming concepts. ITEC hygiene solutions will be showcasing their new Smart Control for their hygiene systems while our Service Solutions will be demonstrating the Remote Eye support service at both.

Digitization, Automation, and Integration

The latest years have shown that new technologies and faster networks have pushed meat processors to the next level of data acquisition and analysis. Leading this transformation, Frontmatec will focus its presence at IFFA on bridging the data acquisition and analysis with the equipment solutions.

Frontmatec will present its newest software solution, Frontmatec BIS (Business Intelligence Systems). Frontmatec BIS is a digital ecosystem for the transformation of data for many different data sources to ensure data-driven operations. Frontmatec BIS allows users to use fact-based knowledge for critical decision-making regarding food safety, traceability, and overall effectiveness in meat production.

At the Frontmatec booth, it is also possible to experience the food processing software, GO, which will cover key production process areas for data collection across the production floor as well as device and line monitoring covering supervisory control and data acquisition.

The GO platform for traceability ensures constant, direct access to valuable information that can reduce losses on expired products and optimize the product age level. It also provides direct real production time data which is crucial for modern meat processors to optimize ordering, packaging, and palletizing processes.

Advances in Automated Carcass Grading

Frontmatec has with the in-line AutoFom and the handheld Fat-O-Meat'er instruments defined how pig carcass grading is done in modern slaughterhouses worldwide. These industry-defining instruments are now being matched with solutions for the beef industry. On display at IFFA, will be the innovative Beef Classification Center 3 – BCC-3 – a step-change in the accuracy and the wealth of useful information available with automated in-line carcass grading. Using advanced multi-view stereo imaging it creates full 3D images of the split carcass and produces accurate EUROP grading scores and weight estimates of the primal and commercial cuts. Information that allows the slaughterhouse to maximize the economic value it gets out of each carcass.

Launch of Q-FOMTM Beef for Objective Assessment of Meat Quality

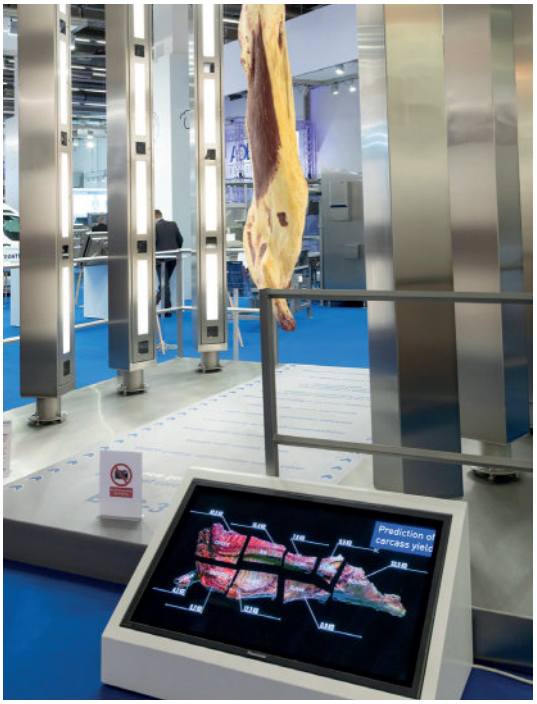
A new standard for accuracy and reliability in meat quality grading will be launched at IFFA. Q-FOM Beef is a sophisticated, hand-held grading camera that is transforming the way meat quality is assessed. Set to replace subjective grading by the eye of commercial graders, the industry will now get access to reliable and consistent measurements of beef cuts' marbling, meat color, fat color, eye muscle area, and other traditional parameters important to the industry. With a bespoke GO module for Q-FOM Beef the complete integration to the plant's production planning is secured.

Let the Robots Do the Work

The unrivaled broad program of robots covering dressing lines, overcutting, and deboning to packaging helps reduce labor, increase quality and yield. At IFFA, our experts from AIRA and Frontmatec will offer advice on robotic solutions and where best to automate along the process line. Several robot solutions will be demonstrated, including the world's only circular blade Cattle Splitting Saw. AIRA will also reveal their new Leaf Lard Remover robot for the first time, which will take the strain from one of the most tedious operations on the dressing line.

For the cut floor, the Frontmatec Robotic Chine Bone Saw is on display in a completely new configuration. Besides labor-saving, the possibility to create recipes with parameters suitable for different customer wishes or changes in raw material provides considerable efficiency and yield gains.

One of the key goals within the meat industry is improved ergonomics and Frontmatec continuously develops automatic solutions to reach this goal! The latest state-of-the-art solution is a high-speed Pork Single Rib Puller with the automatic pulling of single ribs with robots, removing one of the most straining working tasks within the pork deboning industry.



The unique Frontmatec 2D Loin trimmer has been updated with ultrasound to measure and classify loins with bones individually. Loins without bones are measured and classified by the use of a probe. The input from the probe and ultrasound is also used to adjust the cutting knives and pressure wheels for the most optimal cut according to the selected product types, thus greatly improving yield and reducing labor costs.

Optimizing and gaining higher yields is a constant goal for the meat industry. The Frontmatec Q-line system can help improve the production quality and yield, as it is designed for trimming high-value products from beef as well as pork. All by-products from the trimming process are collected in trays, giving complete batch control by automatic weighing. For the Q-line, Frontmatec has developed 3 different software versions optimized for the required type of production.

The popular ITEC Star Clean walkthrough hygiene station for sole and hand hygiene - presents itself at the Frontmatec booth with a new future-oriented Hygiene 4.0 feature: Smart Control - Central visualization and diagnosis of machine states to optimize operational processes. Smart Control provides a precise overview of necessary and upcoming service and maintenance work, enables error analyses via remote maintenance and provides usage and consumption data at the push of a button. It cannot only be integrated into a hygiene station but in all units that are part of the operational hygiene process.

With Covid in mind, several fully operational ITEC hand disinfectant units will also be on display on the booth to demonstrate the superior built quality that is capable to operate in the harshest type of environments.

www.frontmatec.com

IFFA Hall 9.0 Stand E 16

CSB-SYSTEM AT IFFA: MEAT MANAGEMENT MADE EASY

ERP Provides Optimization Opportunities in Challenging Times

The industry ERP specialist CSB-System is presenting a multitude of technology solutions to digitize and optimize business processes – which is becoming all the more important in the face of growing challenges.

With its Meat Management Matrix, CSB visualizes the opportunities of introducing an ERP system that is tailor-made for the meat industry, making it easy to reconcile the specific requirements of a business with the multifaceted capabilities of a comprehensive solution.

The meat business is not easy: meat manufacturers need to hold their ground in an increasingly global competition. The supply chains are becoming more complex, and retailers place further requirements on supply capability and quality. Increasing material prices add to the pressure on profit margins. The businesses in this industry need to open up new sales channels while ensuring compliance with stringent legal requirements. At the same time, they need to advance the digitalization in their factories. When you're dealing with system optimization in the meat industry, you are faced with divergent requirements and varying starting conditions.

Entry Points to the Smart Meat Factory

• It's all about data: legal regulations and consumers demand traceability back to the producers, a trend that poses a big challenge on many businesses. Transparency and accurate decisions are based on data and the ability to create fast evaluations. Functions like smart production scheduling, reporting on defined KPIs, information from finance and controlling, or the optimization of inventory management are therefore at the top of the list of most companies

• The supply chain is the crux of the matter: rising costs in the supply chain and the volatile export market force businesses to respond fast, plan accurately, use resources efficiently, and reduce losses in their supply chains. They need to be able to adapt their product range to the wishes of the consumers, such as regional and natural products, while enhancing the vertical integration in the areas of convenience foods and snack products. If you want to come out a winner, you need to continually optimize your value chain. This will not be possible without investments in information technology. Such investments do pay off if they are tailored to the needs of a meat-processing business.

• Automation is the key: if you aim to automate production, you should primarily focus on the integration of ERP, MES, and CIM. Predictive maintenance and robotics will further enhance your processes. The smart design of your operations opens up new optimization opportunities for your business. This step is all the more important as the industry feels the pressure from increasing costs, regulations, changing consumer behavior and fierce competition.

• New equipment enabling M2M communication, OEE reporting, and the integration of online stores is the prerequisite for an integrated information and materials flow. By harmonizing the data all the way from the slaughter process to the consumers, you can make your business more resilient and more competitive, and initiate further growth.

IFFA shows ERP from all perspectives
These different wishes and perspectives will change the way businesses embark on the digitalization of their operations. If you seek to keep a firm grip on your entire value chain and to future-proof your business, introducing a comprehensive system with specific functionality for the meat industry will be vitally important in the medium term. At IFFA 2022, CSB-System is presenting possible system configurations and special features available for the different areas in the meat industry, illustrated by the Meat Management Matrix. The solutions for the meat industry are available as BASIC ERP for small businesses, as FACTORY ERP for single production facilities, or as comprehensive INDUSTRY ERP for an entire group.

www.csb.com

IFFA Hall 11.1 Stand C30

THE FUTURE STARTS TODAY.

You think of a new food product, chances are we already have the technology and the know-how to make this a reality.

Join us at IFFA May 14th-19th and discover how we can empower you today to meet the challenges of the future.

GEA exhibits in Hall 8 Booth G20.

GEA Engineering for a better world.

GEA.com

HANDTMANN PRESENTS THE LATEST TECHNOLOGIES AND INTEGRATED PROCESS SOLUTIONS FROM PRODUCT PREPARATION TO PACKAGING

Handtmann Customized Solutions

Handtmann will be presenting the latest technologies in the form of integrated process solutions from product preparation including mixing and grinding, to cutting-edge processing technology for pumping, feeding, portioning, linking, forming, dosing and separating as well as product handling including weighing, feeding and depositing into packaging solutions. Handtmann Line Solutions (HLS) are responsible for the development, planning and implementation of these integrated production lines. Handtmann Customized Solutions (HCS) provide tailor-made customer solutions for individual needs. Handtmann Digital Solutions (HDS) offer optimum support for these complex production processes as well as for state-of-the-art production management based on the latest Industry 4.0 essentials. This new and comprehensive service offer is now complemented by original Handtmann consumables such as cutting sets for the first time. New product ideas and trend products can be found in the Handtmann Food Innovation Centre on the exhibition stand, measuring approx. 2,000 square meters.

In the area of product preparation, Handtmann Inotec grinding technology will be on display as well as the BC140-iT-300 automatic processing unit and the VarioMix mixer. These universal processing units can be used for the simultaneous heating, cooling, mixing, grinding and emulsifying of firm, pasty and fluid products, and as all-rounders can be perfectly deployed as stand-alone machines but also integrated in modern, complex production processes. At the trade far, they are presented as part of a dosing solution from product preparation to tray packaging, comprising BC140-iT-300, VF 820, DS 552 dosing system, transfer system and tray sealer. The dosing process is generally possible on 2 to 24 lanes directly into thermo-forming packaging, trays or onto a conveyor belt. The innovative dosing principle with return suction without filling pistons and valves can dose fluid to semi-viscous filling products precise to the gram and with great process reliability.

On the stand, interested parties can also find a new modular overall solution for the fully automated production of formed products, comprising VF 828 S vacuum filler, GD 451 inline grinding system, FS 525 forming system for either free forming or forming and separating, WS 910 weighing system in the new advanced version and the new Handtmann transfer system for product depositing into the packaging solution. In addition to a variety of other forming solutions, the new FS 507 1- or 3-lane forming system for premium steak haché burgers and premium meat or hybrid burgers will be introduced.

Innovations will also be presented in the area of sausage production, from the new length unit for sausages in natural casing in artisan production to the new hanging unit for industrial high-performance production. The highlight of this segment will be the new PTH portioning, tying and hanging line for the automatic filling, portioning, tying and hanging of products in natural casing. The ConPro systems for sausage-shaped products in alginate

Integrated Handtmann line solutions for formed products (comprising the modules VF 828 S, GD 451 inline grinding system, FS 525 forming system, WS 910 advanced weighing system and transfer system)

PTH line (consisting of vacuum filler, tying machine and hanging unit)

casing will also make up a part of the trade fair presentation, as will Handtmann Inotec's tying machines and link cutters.

In Handtmann's core competence of filling and portioning technology, the two new VF 806 S and VF 808 S vacuum fillers and the GD 455 inline grinding system, newly developed to fit this category, will be presented in Frankfurt for the first time. Flexible performance adjustment to increasing production capacities and the combination with either Handtmann sausage linking lines and forming and depositing systems render them suitable for use for small-scale through to industrial producers. The new, advanced VF 608 plus edition of the vacuum filler with numerous new auxiliary devices, such as the new DV 85-10 dosing valve for the automated production of skinless sausage specialities, soup add-ins and fillings, will be on display for the butchery trade. The new VSP-1 skewer machine meets the increasing demand for formed barbecue and convenience products from meat, meat substitutes or vegetables.

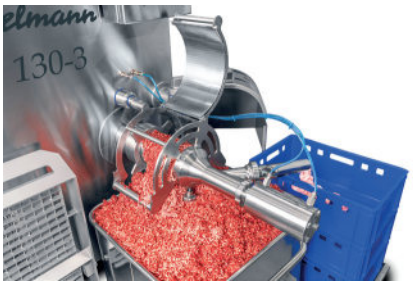
www.handtmann.de/food

IFFA Hall 12.0 Stand A 80 Stand A 81

MASCHINENFABRIK SEYDELMANN KG PRESENTS NUMEROUS MACHINES AND ENTIRE PRODUCTION LINES

Vacuum-Konti-Kutter K 144 AC-6

Universal Grinder AW 300 U



Cutting Drum

On more than 1,000 square meters of booth space, Maschinenfabrik Seydelmann KG will present numerous machines and entire production lines around the production of meat and meat alternatives to the visitors of IFFA 2022 - including many innovations and further developments:

Novelty: Vacuum-Konti-Kutter KK 144 AC-6

The family of emulsifiers has grown. With the newly developed Vacuum-Konti-Kutter KK 144 AC-6 Seydelmann now offers its customers the entry into ultra-fine emulsifying with vacuum technology for medium production quantities.

Emulsifying under vacuum results in a more compact sausage meat with constant volume weight and increases the shelf life of the final product. Higher protein extraction is achieved and better color stability is obtained. The cutting set operates frictionless and thus without metal abrasion.

Due to the low overall height and compact design of the KK 144 AC-6, the hopper can be placed under the outlet flaps of a mixer or under the cutter ejector, thus integrating the machine directly into the product flow is possible.

New Generation: AW 300 U Universal Grinder

The completely revised and newly designed Universal Grinder AW 300 U of the second generation with higher hourly output, lower energy consumption and even better particle definition, has the grinder outlet now, as all industrial grinders from Seydelmann, on the right side. Like the AU 200 U, it has a cleaning hatch and removable bearing for the feeding worm. The hygienic design has also been further improved in other areas. For example, CIP connections facilitate cleaning of the main bearing seal and the machine stand is designed without hollow bodies, such as tubes or closed profiles. Polished, sloped surfaces facilitate cleaning. A swiveling crane for the grinder nut improves ergonomics and relieves the operator during cleaning and cutting set change. The worm design has been optimized and thus, together with the intelligent control system, the hourly output of the AW 300 U has been increased - regardless of whether fresh meat or whole frozen meat blocks with a temperature down to -25 degrees Celsius are being processed.

Further Sizes: Cutting Drum

The Seydelmann Cutting Drum ensures the efficient separation of hard parts and foreign bodies such as plastic particles or foil residues. The system, consisting of a perforated drum and an extended working worm, allows, compared to conventional cutting sets, a higher throughput and thus hourly output at a lower temperature input. In addition to the already existing sizes E 130 and G 160, it is now also available in the outlet size U 200. The system operates without friction and therefore without metal abrasion. The service life is significantly longer than that of soft separators or the usual grinder cutting sets.

Included for the First Time: Trolley Tumblers

Anyone producing deli salads or vegetable mixes or offering spare

ribs, marinated steaks, chicken wings and pulled pork encounters a major challenge: the individual components have to be processed carefully. What sounds simple is not easy to achieve. This is because particularly gentle and uniform mixing, tumbling and marinating is important. In the Trolley Tumbler, the standard trolley filled with the products to be mixed serves as the mixing container. Loading and emptying of the machine, as with conventional mixers or tumblers, is not necessary. This allows fast product changes and minimizes product losses. Depending on the machine design, mixing is performed by horizontal or cross rotation - if desired, also under vacuum. Simple operation and easy-to-understand controls reduce personnel requirements: only one person is needed to operate the machine. Maximum operating safety is ensured by the protective fencing with monitored safety door and the laterally positioned and moisture-protected electronics.

New Generation: Vacuum-Cooking-Cutter

All Vacuum-Cooking-Cutters of Seydelmann have been revised and further improved especially with regard to automation and hygenic design. For example, the seal in the lid for sealing the bowl is now removable and adjusts itself. This simplifies cleaning and eliminates the need for time-consuming adjustment work when replacing the seal. The pipes and nozzles of the bowl heating/cooling system are made entirely of stainless steel. The machine frame is now ventilated with positive pressure to exclude the ingress of dust or moisture. The K 206 and K 556 industrial cutters are also being presented as a new generation of machines. Here, too, the focus is on hygienic design.

The basic equipment of all cutters includes the AutoCommand 1000 control system with program control for automatic recipe-controlled operation of the machines.

www.seydelmann.com

IFFA Hall 8.0 Stand A 02 Stand A 05 Stand A 06

LIMA: A WORLD OF SEPARATION

LIMA are specialists in the manufacturing of meat-bone separators, deboners and grinders-desinewers with a world presence through a network of more than 70 distributors.

At IFFA 2022 Show, LIMA will Exhibit the Following Equipment:

LIMA meat-bone separators for poultry for the highest quality of mechanically separated meat at high yields with its LIMA RM 50 S and LIMA RM 2000 S. With its compact size, the LIMA RM 50 S enables to reach yet substantial outputs and is perfectly sized for chicken meat-bone separation applications, up to 600 kg / hr (1 320 lbs / hr) input capacity in chicken carcasses. The LIMA RM 2000 S is simply the biggest LIMA meat-bone separator available on the market: up to 20 000 kg / hr (44 000 lbs / hr) input capacity of chicken carcasses

A LIMA RM 700 DSPM deboner for pork bones, its low-pressure technology allows very important reduction of the calcium level in the mechanically separated PORK meat while keeping optimum yields. The result is a well-structured recovered mechanically separated meat with technological performances close to minced meat. This model can process up to 3 500 kg / hr of pork back and neck bones without any pre-grinding.

A LIMA RM 180 GDM Grinder-Desinewer. LIMA has just developed a NEW range of Grinders - Desinewers GD/GDM specifically for poultry bone-out raw materials: trimmings with or without wishbones, deboned thigh and drumstick meat.

This NEW technology enables to produce a very high-quality ground – desinewed poultry meat in terms of texture & color at very high yield. This recovered meat is NOT a mechanically separated meat but a true ground and desinewed meat produced out of bone-out meat cuts or trimmings.

Other main advantages of LIMA's Grinders-Desinewers GD/GDM: very high yields from 86 to 99 %, optimized C/P ratios, low temperature increase, very hygienic design and very low maintenance costs.

www.lima-france.com

IFFA Hall 9.0 Stand C 51

THE SMART WAY TO THE PERFECT SAUSAGE

KARL SCHNELL Portioning & Hanging Lines offer flexibility and high performance.

Portion and length accuracy at highest throughput are the requirements in industrial sausage production. Company's newly developed Portioning & Hanging lines meet these specifications.

Centrally controlled by KS P-Series Vacuum Fillers - the filling machine, the Linking & Portioning Device APG and the Hanging Device AHG form a single unit. The central servo concept for all drives ensures precise conveying and portioning. All functions can be visualized and easily operated on the clearly arranged, swiveling operator terminal.

The modular design and the flexible combination options of the individual modules guarantee smooth, ergonomic work and reliable hanging with efficient smoke stick utilization.

KS Portioning & Hanging Lines are available for all casing types and production capacities. Fast interchangeable linking chains provide high flexibility for sausage lengths and calibers. The integrated casing end detection for best casing utilization and the twin head

system for optimized production speed complete the system.

The fully automated system also offers a generous casing magazine and an extremely fast fully automatic casing change time in under 2.5 seconds.

With KS Portioning & Hanging Lines, the user has all the advantages of automated production - process reliability, low service costs and high production availability.

www.karlschnell.de

IFFA Hall 8.0 Stand G 96

AUTOMATIC PRE - PACKING FOR MEDIUM-SIZED BUSINESSES, CRAFT & DELI

More sales and the highest possible margin: the fully automatic slicing and packaging machines are ideal partners for flexible in-house slicing.

The Austrian company S.A.M. KUCHLER Electronics GmbH develops and produces high-quality slicing and packaging machines at its headquarters in Klagenfurt, Austria: For 60 years, the focus has always been on automatic slicing and packaging of sausage, ham and cheese in the smallest possible space. The constant further development of the equipment has led to world leadership in innovative solutions in the retail sector.

Slice & Pak

At IFFA 2022, S.A.M. KUCHLER Electronics will present the latest innovations in automated slicing and packaging in the smallest possible space for flexible production facilities in the SME, craft and counter sectors. The equipment can be used where slicer systems are too large, oversized and inflexible. Due to its small footprint, the S.A.M. slicing and packaging line requires only a footprint of about two meters and produces about 150 packs per hour fully automatically. The innovative S.A.M. PX3 independently produces ready-to-serve slices in multilayer SamPaks, which are automatically packed, weighed and labeled.

The customer is also offered a special extra: The cold cuts are packed in several layers. This allows them to be opened in portions, and unopened layers retain their freshness. Labeling is carried out in the next step - also fully automatically.

Packaging

In terms of packaging S.A.M. offers a unique possibility for the presentation of freshly cut goods.

Avoiding plastic is a priority for consumers. The new Bio-SamPak – a biodegradable film that can be composted in the garden – brings a new perspective to packaging materials. It offers the same hygiene standards, the same convenience and is transparent like plastic – but fully biodegradable.

www.sam-kuchler.com

IFFA Hall 11.1 Stand C 71

Oliver Schott
Sales Director at Bettcher GmbH

In the development of our products, we pay special attention not only to performance, but also to uncompromising quality.

Markus Jentner
International Sales Manager at Bettcher GmbH

In an industry that involves hard physical labor and where there is a lack of skilled workers, we want to provide products that make the work considerably easier.

HIGH YIELDS, EFFICIENT PROCESSES, AND ERGONOMIC FEATURES: FIRST-CLASS MEAT PROCESSING RESULTS WITH QUANTUM FLEX® TRIMMER SYSTEM

After a long hiatus, the meat industry is looking forward to IFFA 2022 and the new products to be presented by the exhibiting firms at the leading international trade show for processing, packaging and marketing of meat and alternative proteins.

The focus of the Bettcher GmbH trade show exhibit will be on the company's advanced trimmer technology. Meating Point News talked to Oliver Schott, Sales Director, and Markus Jentner, International Sales Manager at Bettcher GmbH, about trade show expectations and IFFA highlights, trends in meat processing, and more.

Q: Over the past two years many tradeshows were postponed due to the pandemic, IFFA 2022 – one of the major trade shows – will be opening its doors. How important is it for Bettcher GmbH to take part?

Oliver Schott:
IFFA is an extremely important trade show for Bettcher: As the world's largest and most well-known trade show for meat and meat processing, it regularly draws international visitors. We frequently experience genuine fascination among the trade show visitors, and so we coordinate the launch of our innovations with the IFFA exhibition dates. After a two-year hiatus of trade shows, we are really looking forward to being able to talk to existing and potential customers in person again. A video conference – as happy as we were to be able to use this technology during the past two years – is simply no substitute for a face-to-face encounter.

Markus Jentner:
It is always exciting to see which industries are interested in our products: In addition to meat and fish processors, our trimmers are increasingly being used by companies for industrial vegetable

processing, such as peeling pumpkins, or by automotive companies in search of a solution for cutting the foam for car seats – the visitors come from a broad range of industries.

Q: How did Bettcher get through the "trade fair free" period?

Oliver Schott:
There have been major changes at Bettcher in the past three years. As a pioneer for trimmer applications we have been active on the market since 1944 and we recently invested in new technologies and processes at our headquarters in Birmingham, Ohio in the USA. This has simplified internal processes and accelerated our response times and allows us to operate with even more flexibility.

Markus Jentner:
We rely on our long-established network of sales partners, with whom we have a good working relationship. In certain countries we recently changed our sales structures to direct sales and successfully established new markets. With our new management and the new sales structures, we are optimally prepared for the future, especially for the European markets. So, there is a general sense of optimism at Bettcher that will also be evident at IFFA.

Quantum Flex® trimmers are designed for custom adaptation to the user, by changing the size of the handle, thumb rests and many other exchangeable parts.

Oliver Schott:
Of course, that is also reflected in our product portfolio, which we will present at IFFA.

Q: What highlights can visitors look forward to at the Bettcher trade show exhibit?

Markus Jentner:
The focus will be on our Quantum Flex® trimmer. With this series we have once again optimized several features of our tools for processing meat, fish, and many other applications: The trimmers increase efficiency with less physical effort. They are much less top-heavy than previous models and are designed for very low vibration despite the high speed. Their ergonomic design allows a comfortable hand posture in which the wrist is kept in a neutral position. This prevents operator fatigue, for example in the extremely demanding tasks of the meat processing industry. Quantum Flex® trimmers are designed for custom adaptation to the user, by changing the size of the handle, thumb rests and various other extension changes. Depending on the application we also recommend a depth cutting gage for exact definition of the thickness of cuts. The trimmer can also be easily converted from right-hand to left-hand use, without tools.

Q: How does the Quantum Flex® trimmer system differ from its predecessors?

Oliver Schott:
Quantum Flex® is a complete system that was developed with a focus on compatibility, performance, ergonomics and durability. In addition to the handpiece and blade, this includes the driveline and motor. With the first universal handpiece, which is completely compatible with any Bettcher motor, even older models, we have launched an industry-wide innovation. Another genuine revolution is our patented Quantum Flex® driveline. This driveline consists of a permanently mounted flexible core shaft that requires neither cleaning nor lubrication throughout the entire life cycle. The previous models, which are still widely in use, have to be dismantled, degreased and regreased on a regular basis. This is completely eliminated with the new driveline – which is a real time-saver for our customers. In large plants where numerous trimmers are in use, servicing is a significant time factor. The maintenance-free enclosed system – which is also more hygienic – is a real breakthrough for us.

Markus Jentner:
All Flex models are also available in our tried and tested air versions, although there is a clear trend toward the Quantum electric version because compressed air is the most expensive media in the operation of such tools. Large companies in the meat industry have high power consumption. Even optimizing the power of supposedly smaller machines such as trimmers affects the overall result. Despite higher torque, the electric drive has turned out to be extremely stable and reliable. Our latest electronically controlled synchro motors adapt the speed to the product and increase or decrease the power as needed. They conform to IP class X5, which means they are highly water resistant. The motors reduce operating costs and servicing, as well as noise levels in production. There is a unique trend in the industry toward electric motors.

However, whether a compressed air or electric motor is more advantageous also depends on the application: While electric drives require a fixed location, compressed air applications are more flexible.

Oliver Schott:
Our trade fair guests can experience the performance of the Quantum Flex® trimmer system consisting of DriveLine and electric motor live at IFFA: In the demo booth on our stand, we will be hosting live demonstrations that are sure to inspire our visitors to new applications.

Q: As the world market leader for trimmers, Bettcher can look back on a success story that spans decades. What is your recipe for this success?

Oliver Schott:
The reason for this is certainly the combination of uncompromising quality and unique customer service. Intensive research and development of the tools has always been a high priority at Bettcher. In the development of our products, we pay special attention not only to performance, but also to uncompromising quality. In the latest generation of our trimmers, we have succeeded in reducing the customer's spare parts requirements by further optimizing the single components.

Markus Jentner:
In addition to quality, our development activities also focus on safety and ergonomics. In an industry that involves hard physical labor and where there is a shortage of skilled workers, we want to provide products that make the work considerably easier and with tools that are specially designed for safe handling. Ergonomics has always been very important at

Quantum Flex® Trimmer is a particularly light and fast tool for improved cutting efficiency and yield. In combination with sophisticated edge management and the blade design, Bettcher ensures a long service life for the heavily used blades in industrial meat processing.

Bettcher, with the latest generation of trimmers, we have further optimized the handles and the weight of the handpieces have been reduced. Quantum Flex® trimmers operate smoothly and with very little vibration despite the high speed. All of this makes the tools much easier to operate, leading to less user fatigue. Our customers, including EDEKA Südwest Fleisch of Rheinstetten, confirm that their personnel who use our trimmers take sick leave less often and that there is less fluctuation among employees. The plant switched to the Quantum Flex X1000 trimmer in 2019 and has up to four of the trimmers in use constantly.

Q: And what is special about Bettcher's customer service?

Markus Jentner:
Our customers appreciate the unique customer service of our Bettcher sales experts. Our sales staff provide on-site customer assistance to optimize their processes. During regular visits of the production facilities, they cooperate with the customer to develop ideas for improvements by means of suitable machines, improved handling or optimization of the workplace. They demonstrate how the particular application can be improved, for example by using a different blade or a depth gauge can have a decisive effect on quality and yield in meat processing operations. Of course, it is extremely helpful that most of Bettcher sales experts are trained butchers and meat technicians, who assist our customers at eye level.

Oliver Schott:
Other services also contribute to a high level of customer satisfaction. With our edge management system, we offer a comprehensive blade sharpening and grinding service. This is extremely important, because a dull blade not only results in poor product processing, but also leads to faster fatigue for the person using the machine. Our advanced edge management concept ensures sharp blades at all times: High-capacity plants, where the blades have to be sharpened and ground every day, generally use a Bettcher grinder. It is designed to allow convenient operation even by inexperienced

personnel. In smaller plants, which may have only one of our trimmers, the purchase of a grinder is not cost effective. These customers send their blades to Bettcher, where they are sharpened in our factory.

Q: What are the current trends and developments that you see on the meat market?

Markus Jentner:
The major issue of sustainability is of course also relevant for the meat industry. What can be done to improve sustainability in industrial meat processing? Our answer is to use durable tools with higher energy efficiency and to continue reducing spare parts requirements. At the same time, our products help to increase yields in meat processing and to utilize the valuable raw product completely. For us, sustainability also means improving conditions for the workforce in an industry where there is a shortage of skilled workers and high fluctuation. That is why our research and development department is committed to making our tools as easy to use as possible.

Oliver Schott: Concerning current trends in meat processing: We notice time and again that the various national meat markets benefit from "thinking outside the box". Looking at other markets around the world and their special applications and cuts in meat processing leads to the development of new products. Increasingly, cuts of meat are being processed that were previously not held in high esteem – for example, the demand for ox or pork cheeks is still relatively new in parts of Europe. In this respect Bettcher benefits from the knowledge transfer of our international team: A product can be processed in many different ways. A different device or even a different blade can have a great impact on the quality and yield of the piece of meat or can lead to entirely new products. As the world market leader for trimmers, we are familiar with a broad range of applications worldwide. With our expertise and knowledge of international meat processing, we support our customers with new ideas, show them which applications exist elsewhere in the world and what else they may be able to get out of their products – in this way, we cooperate with our customers to develop the truly best solution for their product. ■

STATE-OF-THE-ART CUTTING SOLUTIONS FOR MEAT AND MEAT ALTERNATIVES

Cutting solutions need to be flexible and innovative in the very diverse meat industry. The way meat is cut significantly affects its taste. Be it dices, shreds, or hand-pulled look; it must be cut with precision and efficiency. Cut quality, flexibility, and speed have become more critical than ever. Herein lies the instrumental role of industrial food cutting equipment utilized in the meat processing industry.

FAM specializes in offering the best-fit cutting solutions designed for customers' specific needs, and it's committed to increasing customer production capacity and yield while reducing costs and time to process. Via sister company Stumabo International, the company's premium blades are manufactured in-house. Stumabo makes these precision blades from the best food-grade stainless steel. FAM experts specialize in selecting the proper blades for meat and/or poultry applications, using the correct blade thickness, cutting edge grind, edge profile, and strength.

Innovative Cutting Solutions

FAM has designed new heavy-duty machines for cooked and frozen tempered meat products:

• The FAM CMD.2 is a large drum dicer capable of cutting frozen pork, beef, and chicken in very clean dices, producing a free-rolling product that is easy to package (no stickiness).

FAM CMD.2

FAM Yuran™ Hytec

• The FAM Yuran™ Hytec is a true example of a very sanitary design, allowing customers to change from one product to another with a reduced cleaning time. This machine can cut frozen/tempered or chilled, as well as hot cooked meat and poultry in dices and strip cuts, or hand-pulled pork.

Above all, FAM equips customers with a definitive advantage through the simplicity of the design of their products. For instance, in an industry where cut quality, flexibility, and speed count more than ever without compromising yield or quality, FAM sets a benchmark with its advanced mechanical cutting machines.

Meat Alternatives: a Booming Industry

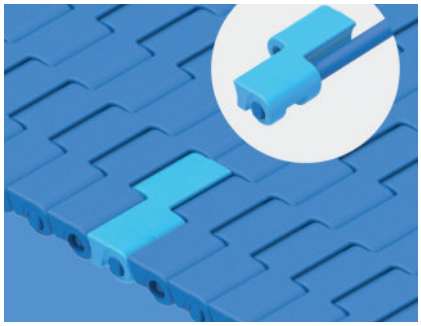
With the vegetarian and vegan industry booming, new types of food are entering the market. At FAM Stumabo, we have been heavily involved in identifying the cutting needs for these new products.

To get an organic cut, FAM uses its FAM Yuran™ Hytec. It is the preferred machine for these products, mainly because its superior hygienic design meets this industry's often very high standards. Although meat alternatives also include tofu, seitan, and tempeh, most meat alternatives are extruded products. Cutting extruded products from a power heater or extruder is not easy. Because of the fast-changing consistency in texture and density, the product needs to be cut when it's still hot, immediately after extrusion. When the product gets cold, it will be challenging to pull apart, and it will mainly cling together in big pieces.

www.fam.be
www.stumabo.com

IFFA Hall 8.0 Stand D 30

HOW DO YOU AVOID CONTAMINATION IN YOUR PRODUCTION LINE?



No migration into foodstuffs of any substances harmful to health. That is what we assure our customers with our conveyor and processing belts.

Forbos' hygiene concepts like HACCP belts that close potential safety gaps lets you focus on your core business.

We Take Care of the Rest. Clean Promise

Food manufacturing, packaging and distribution is all about hygienic and reliable processes, especially when processing meat or poultry.

All Forbo belts are superb choices for this industry, regardless of whether they have fabric tension members, consist of plastic modules, or are homogeneous belt types. They are very easy to clean and in addition to good levels of resistance to standard cleaning agents, they are also resistant to oil and grease.

Siegling Fullsan is the new product line of homogeneous, thermoplastic, polyurethane belts from Forbo Movement Systems. All Siegling Fullsan belts are protected from contamination by oil, grease, moisture, and bacteria. Siegling Fullsan belts are very easy to clean and ideal for exceptionally hygiene-critical applications (meat and poultry processing, dairy products, dough preparation and other food-related areas).

The new Prolink S18-44 HDK 2.2 + (High Deck) variant in the curved modular belt series 18 has a raised belt surface to allow cost-efficient and hygienic belt tracking. As a result, the High Deck design guarantees products can be pushed off at the sides and has sufficient width, which extends beyond the actual belt width, to convey products. The 44% open area on the surface provides exceptional airflow and superb drainage.

A new ProSnap Quick Release fastener (PSP) was developed for Forbo Movement Systems' micropitch Prolink series 13 and can be integrated into a diverse range of this series' variants. The hygiene-critical food market has necessitated for a quick-release fastener for cleaning-out-of-place processes.

Forbo's conveyor and processing belts' pledge is simple - no substances harmful to health can migrate into food.

The hygiene concepts, such as HACCP belts, minimize food safety risks and let the customer focus on the core business.

www.forbo.com

IFFA Hall 9.1 Stand E 61

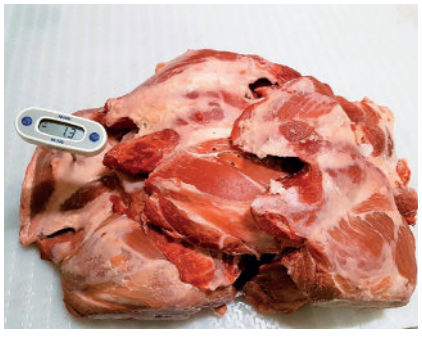
FROM SINGLE COMPONENTS TO COMPLETE READY MEALS:

Tempering and Pasteurisation of Meat and Alternative Proteins with Microwave and Radio Frequency Solutions from SAIREM

SAIREM, a world-leading specialist in microwave (MW) and radio frequency (RF) industrial solutions based in Lyon, France, will showcase the company's innovative systems for meat and ready meals. From tempering and defrosting to the production of ready meals, SAIREM equipment supports the production of consistent high-quality products.

MW and RF for Speed and Safety

The use of microwaves is a thermal process that heats from the inside out, eliminates cold spots and enables precise temperature control. It is authorised in the processing of organic food by most international organic certification bodies. The process leads to meat products and ready meals with a better, fresher taste, texture and colour. Healthy nutrients are preserved and the need for additives is eliminated. Additionally, the speed of the process coupled with the right temperature settings limits bacterial growth and ensures food safety. SAIREM's MW and RF systems optimise the tempering, cooking, and pasteurisation of all kinds of raw and processed meat. A further advantage is that SAIREM equipment is energy efficient and 100% electric. There is no greenhouse gas emission at the production plant.



Due to the speed and uniformity of SAIREM's MW and RF technology, tempering and defrosting only take from 3 to 20 minutes with minimum drip loss and degradation, thereby maximising raw material yield.

Tempering and Defrosting – The Perfect System for Perfect Beef, Pork and Poultry as well as Alternative Proteins

Due to the speed and uniformity of SAIREM's MW and RF technology, tempering and defrosting only take from 3 to 20 minutes with minimum drip loss and degradation, thereby maximising raw material yield. There is no need to unpack products as they can easily be processed in their original packaging. Temperature homogeneity throughout the food block allows for better post processing of products and can be continuous or in batches – tailored according to the customers' production needs.

From tempering and defrosting food to the production of ready meals, SAIREM equipment supports the production of consistent high quality meat products with an extended shelf life.

SAIREM equipment includes a range of batch tempering ovens, continuous flow MW and RF tempering tunnels which can be fully automated and optionally combined with other equipment.

Pasteurisation – Creating Delicious Ready Meals

In close collaboration with CTCPA in Avignon, France, enabled SAIREM to develop the new generation of pasteurisation tunnels. The customer can pasteurise only or cook and pasteurise at the same time depending on the ingredients and the recipe. The latter is more suitable for chicken and vegetable meals as they have a shorter cooking time all together, whereas red meat and pork should be precooked to ensure a more efficient process. The tunnels pasteurise at a maximum temperature of 95-100°C depending on the product and the wished pasteurisation level. They process all types of trays no matter the size or the composition - plastic, glass or paper based - and can also be used for thermoformed packs and pouches.

www.sairem.com

IFFA Hall 9 Stand C 98

JEROS – HYGIENE ENSURED EQUIPMENT

JEROS are specialists in cleaning critical process equipment and produce washing solutions for the food and processing industry, where there are high demands and focus on hygiene and at the same time achieving an efficient production flow.

Automating the Washing Process

An automated washing process ensures the same effective result every time, every day. It ensures a high level of continuously uniformity and food safety as the system washes with an temperature 52°C and rinses with 85°C. Hereby ensuring disinfection of the equipment/components from the process lines possible without any bacterial or listeria leftovers.

Kills Bacteria and Boosts Productivity and Avoid Cross-Contamination

In recent years the company has seen an ever-increasing focus on hygiene from the industry. With certification from Eurofins Steins, JEROS can guarantee a bacteria-free (listeria/salmonella) washing result within only 3 or 6 minutes wash cycle.

The washing solution is designed to ensure the highest quality, where no compromises are made with the food safety and to avoid cross-contamination.

JEROS imparts a general increased hygiene standard with this fully automatic washing solution.

Minimize the Unproductive Wash Downtime

Investment in automating the washing process has a short payback time, as the downtime associated with manual cleaning is massively less. At same time it ensures the lowest possible consumption of water, chemicals and electricity, which brings a number of benefits to the environment and sustainability. With the investment in an industrial washing solution, the food company can significantly increase its output and concentrating on producing.

www.jeros.com

IFFA Hall 9.0 Stand A 45

Thomas Neher,
Vice President Slicing EAPMEA, Provisur Technologies

Brian Perkins,
President, Provisur Technologies

Olivier Kerdiles,
Vice President of Separation and DMC, Provisur Technologies

MEAT THE INNOVATIONS

Provisur is a leading industrial food processing equipment manufacturer headquartered in Chicago, Illinois, with a global network of sales and service locations. The company holds an impressive number of patents for industry-leading traditional brands: AM2C®, Beehive®, Cashin®, Formax®, Hoegger®, Lutetia®, MultitecTM and Weiler®. In combination with the ability to innovate, this know-how enables Provisur to offer tailored and highly efficient solutions for food processors of any size or application.

At IFFA 2022, the company will present its latest innovations in line with its motto 'Provisur – many legacies, endless possibilities'. We caught up with Thomas Neher (Vice President Slicing EAPMEA), Brian Perkins (President) and Olivier Kerdiles (Vice President of Separation and DMC (Defrosting, Marinating, Cooking)) to find out more about Provisur innovations, the company's IFFA 2022 showcase and future trends in the food processing industry.

Q: Many legacies, endless possibilities' Can you explain what the slogan means to Provisur and how this has driven innovation since the last IFFA?

Brian Perkins:
Provisur consists of a wide range of market leading technologies and brands. Together, they create something that is much bigger than the sum of its parts. These technologies provide a rich portfolio of technical capabilities that allow us to offer a broad cross section of processes and equipment. They extend our global reach and infrastructure allowing us to support our customer base around the world.

Thomas Neher:
The last few years have been some of the most innovative for us. IFFA, which is the industry-leading show for meat and alternative protein processes, is the perfect place to showcase the results. Each of our Business Units (BU), "Further Processing – "Slicing" – "Separation", will present outstanding innovations. Such as the new Formax NovaMax 400 Former from our "BU Further Processing", that sets new standards with its latest forming technology combined with extremely high output rates. Provisur`s "BU Separation" are the only supplier in the market that offers all three separation technologies from an application

At IFFA 2022 Provisur is showcasing a multitude of novelties for slicing e.g. a fully automated meat trimming system as part of the TrimX innovations as well as value-added application development using the patented Lutetia tumbling process.

stand-point: Press-Separation, Rotation-Separation and Band-Separation. Especially the STS generation of Band Separators now comes in a wider portfolio from small to big industrial machines.

The BU Slicing will present a world novelty at IFFA for the first time. Portion loading in automated slicing offering unmatched flexibility and incredibly small footprint, like never seen before. Furthermore, a fully automatic and intelligent bacon line to Trim – Press – Slice – Portion can be seen: Bacon bellies in – perfect portions out, giving incredible yield!

Lutetia, the well-known brand for defrosting and smoking in chamber and tumbler processes offers and shows new technologies in their portfolio such as Proactivation and Clean Label.

Provisur`s world-wide team, specialists from the different highly renown companies and brands that have been in their markets for decades, are constantly bundling their forces to offer integrated solutions and exceptional innovation, as described. The many legacies, thus, create endless possibilities for our customers!

Q: What impact will these innovations have on your customers? Provisur is proud of its customer support - how exactly do you support them?

Brian Perkins:
We build integrated line solutions for our customers. Provisur's leading-edge technology is the result of our continuous effort to keep the needs and requirements of our customers at the top of our priorities. Yield, quality, and throughput have a direct impact on customers' business as they seek to supply consumers with safe, nutritious, and affordable food. Provisur certainly has a tradition of delivering innovative technology but perhaps even more importantly delivering application expertise rooted in food science, equipment technology and practical, realistic, food plant operational experience.

Olivier Kerdiles:
For us, it is important to guide customers and listen carefully to their needs. This starts before any equipment or systems are started up so that we know exactly what process challenges each customer faces. Our Innovation Centre plays a vital role in this. We spend time with our customers to carry out the necessary tests with Provisur product specialists and food scientists on hand to develop solutions. Another unique way in which we support our customers is that our machines collect a wealth of data on yield and production processes – this information is passed on to our customers enabling them to carry out optimization and preventive maintenance. Additionally, Provisur Engineers, with the aid of company internal software, are able to support remote repairs in another part of the world.

Q: What aspects of Provisur innovations do you think will be important for customers at IFFA?

Olivier Kerdiles:
Yield is of course important because it has a financial impact on profitability. One example of how our technologies have a positive impact on yield is in the separation and deboning of meat products. At the end of the deboning process there is always some recoverable protein left on the bones. Provisur ensures that customers can recover more of that protein which leads to a significant increase in yield. We provide tailored solutions for different types of bones - fish bones, beef bones, poultry bones and more. Quality is also very important and goes hand in hand with yield – our processes not only ensure higher yield but also preserve the best possible quality of the final product. Efficiency is closely linked to automation, an issue that has been highlighted during the Covid-19 pandemic as customers need to keep production lines running when staff are off work. Provisur has addressed this challenge by creating lines with more automation and more continuous flow processes. This, again, leads to higher yield while at the same time reducing the number of people on the line.

Quality is very important and goes hand in hand with yield – Provisur's processes not only ensure higher yield but also preserve the best possible quality of the final product.

Q: Can you tell us about some of the challenges that Provisur is facing?

Brian Perkins:
We are facing unprecedented demand for processing equipment,

complete production lines and technical service, in an environment with challenging supply chain issues, a very tight labour market and rising costs. As a company, I have been very pleased to see how our team has responded during these challenging times. From extra efforts and creative solutions from our Sourcing team, to increased internal manufacturing capacity, to the very hard work from our production and service teams who continue to put in a lot of extra time to support our customers, we have risen to the challenge all the way down the line.

Q: What are the main trends that are driving innovation? How do you see the future in relation to meat and alternative protein processing?

Brian Perkins:
As we mentioned, one of those trends is automation. In fact, this is a megatrend. With global labour shortages, our customers are looking more and more toward plant efficiency and automation. The second big trend is the continuous growth in the alternative protein segment which is closely linked to the third trend - sustainability and consumers' increasing awareness of resource consumption. There is continued pressure on the meat industry in terms of its environmental impact. The pet food segment has also grown considerably – not only in volume but in variety and quality.

Thomas Neher:
The worldwide rapid growth of plant-based products means that many formed and shaped products are now made of alternative proteins. As we are one of the world market leaders in the forming of patties, nuggets and similar products, there is a high demand for our systems. We offer solutions for a wide range of applications for food made from alternative proteins. In addition, when traditional products such as cold cuts are made from plant-based materials they can easily be processed on our slicer equipment. There is also a trend for convenience in our societies, linked to smaller families and a growing number of single households. This calls for flexibility in package sizes and frequent changes in the design and presentation of packaging. New packaging materials and technology are bringing change as they strive to offer consumers longer shelf life. Supermarkets demand precisely this flexibility from their suppliers, the food processors, so we need to offer technology that is extremely versatile to give food processors the possibility to react to changes at short notice.

Natural products can be difficult to process because they don't contain additives that bind them but at Provisur we have made significant progress in developing processes that guarantee a clean label brand.

Olivier Kerdiles:
An important aspect of the sustainability trend has been consumer demand for clean label products. Consumers are concerned about allergens and additives and wish to buy products that are as natural as possible. We help our customers meet these demands. Natural products can be difficult to process because they don't contain additives that bind them, but at Provisur we have made significant progress in developing processes that guarantees a clean label brand. However, our processes also serve the more price-conscious consumer segment. Whether upmarket or highly affordable, there is a difference in quality for the consumer when a product has been produced using Provisur technology. We offer the best equipment in combination with the best processes for the best product.

Q: Another trend related to the need for more sustainability has been the avoidance of food waste. How does Provisur achieve this?

Brian Perkins:
Our equipment and technology ensure precision portion control, as well as maximum yield and minimum loss in production. Protein recovery from bones is an excellent example because this is protein that would otherwise end up as waste. In general, our equipment is designed with sustainability as one of its key design parameters. Furthermore, it is easy to clean, with minimal use of harsh chemicals and cleaners. It offers reduced energy consumption, fewer replacement parts and a longer life cycle.

ALTERNATIVE PROTEINS - BRIEF DESCRIPTION OF THE INNOVATION

Why is Your Innovation Relevant?

Pokel Vegan is a ready-to-use structured plant-based blend to create tasty meat alternatives that mimics the texture, flavor and juiciness of the meat.

The main innovations it offers:
- It is 100% natural and plant-based, with no artificial additives.
- It is powdered, so it is easy to store and does not need refrigeration.
- It is very simple to prepare. Juts adding water and oil.

What is New About our Solution?

Pokel Vegan is produced through an innovative process that results in a product that creates a protein structure base with a unique meaty texture, juiciness, fat level and elastic bite. Various protein sources such as pea, soy and vegetable oils can be used as source material.

What Practical Benefits does our Solution Have for the Customer?

- 100% plant-based
- Unique meaty texture, juiciness, fat level & elastic bite
- Simple production process, easy-to-use, simple label
- No methylcellulose
- No artificial additives & colorants
- GMO-free
- Rich in protein and fiber
- Versatile & customizable to specific taste and preference

www.prosur.es

IFFA Hall 12.1 Stand C 39

UK FOOD BLADE MANUFACTURER UNVEILS PLANS FOR £10M EXPANSION PROJECT

Dakin-Flathers, the manufacturer of Freshcut37 meat-cutting bandsaw blades, has unveiled plans to expand their existing state-of-the-art facility by over 7,500m2 covering 3 floors at its current premises in West Yorkshire, England.

Due for completion in early 2023, the Featherstone site will allow Dakin-Flathers to service its customers, in over 100 countries globally, more effectively. The new scheme will allow Dakin-Flathers to maximise production capacity and improve efficiencies across the product range.

The new extension, which can accommodate over 150 employees, will also boast charging points for multiple electric vehicles, improved staff facilities, flexible workspaces and a much larger warehouse that utilises new picking and storage systems.

Oliver Garside, managing director of Dakin-Flathers, explains "Dakin-Flathers has enjoyed rapid and sustained growth, doubling in size three times over the last 20 years, which has led us to become a market leader in our sector.

"We have invested heavily, and will continue to do so, in the business and our employees. Our continued growth will be supported by a range of exciting new ventures and an investment programme in excess of £10m over the next 24 months.

Dakin-Flathers' growing green credentials will also benefit from an expansion of company's PV solar range. Renewable energy generation will increase from 265,000 kWh per annum to more than 900,000 kWh. making their factory as environmentally efficient as possible.

www.dakin-flathers.com

IFFA Hall 9.1 Stand D16

WHEAT-BASED INGREDIENTS FOR A SUSTAINABLE FUTURE

Loryma presents innovative extrudates, wheat starches and functional blends for improved meat products and meat alternatives

Loryma is showcasing its broad portfolio of wheat-based solutions that meet growing global demand for protein-rich, high-quality foods. These offer technological and sensory advantages for meat products, as well as for the production of plant-based alternatives and hybrid applications. In addition, the natural raw material wheat is characterised by reliable availability and short transport distances. The potential of wheat derivatives for food applications is demonstrated by outstanding concepts for a vegan snack plate with cold cuts, delicatessen salads, beef jerky and salami.

Loryma's presence at the show, which is dedicated to the meat and alternative proteins market, presents new, sustainable and economical options for the production of meat products or vegan and vegetarian products based on functional wheat ingredients. These include the innovative texturates of the Lory® Tex range for hybrid and plant-based alternatives, as well as hydrolysed wheat protein

(Lory® Protein H11 and H12) for nutritional optimisation. The extruded breadcrumb Lory® Crumb is the latest addition to the existing, comprehensive modular coating system, which also includes the starches Lory® Starch Saphir and Lory® Starch Brillant to improve adhesion of the breadcrumb to the substrate.

In addition, Loryma offers further functional starches that can be used for different purposes: Depending on the production process, the wheat starches Lory® Starch Elara or Lory® Starch Iris represent an alternative to the banned white pigment titanium dioxide for lightening meat products. The latter can also be used as a small-grain starch in injection brines for improved texture and a higher yield. Lory® Starch Solaris is suitable as a high-performance binding and thickening agent for meat products and vegan recipes. Other binding and stabilising systems for convenience and frozen products, such as meat kebabs or vegetarian versions, complete the range.

Norbert Klein, Head of Product Development at Loryma, says: "Wheat ingredients combine consumer demands for optimised texture, appearance and taste with industrial feasibility. In addition, our application concepts make a meaningful contribution to inspirational new products."

www.loryma.de/en

IFFA Hall 12.1 Stand C64

DELICIOUSLY SIMPLE: MEAT ALTERNATIVES WITH VITATEX®

The easy way to plant-based meat alternatives: At IFFA, GoodMills Innovation presents its new range of VITATEX® plant textures which can be used to authentically replicate various meat concepts. And when it comes to processing, the same machines can be used to produce both meat and meat-alternative products.

Visitors to the GoodMills Innovation booth at IFFA will at first feel as if they are in a familiar "meat" environment. However, the company is showcasing its offerings with a plant-based butcher store: Peas, soy and wheat, the raw materials for VITATEX® texturate, hang from the butcher's hooks. They can be used to produce a wide range of vegan and vegetarian applications that faithfully replicate conventional products based on pork, beef and poultry.

Easy Processing

There are great parallels in the processing of VITATEX® texturates, too, as manufacturers can use the same machines for the production of vegetable mince, patties, nuggets or schnitzel as for meat processing, with no major investments necessary. Texturates pre-swell and are then further processed in a cutter or grinder in the same way as ground meat.

This means that vegetable product lines can also be produced with VITATEX® using existing meat processing equipment - no major investments are required.

Texture is Key

From a sensory point of view, VITATEX® products impress with their meaty, fibrous texture and, from a nutritional point of view, with their high protein content. Jutta Schock, Head of Marketing at GoodMills Innovation: "Texture is the key to an authentic meat alternative and a decisive factor in whether a product is a hit or miss with the end consumer - if the texture is not right, the decision is made: The product will not be perceived as authentic and will certainly not end up in the shopping cart next time. So no compromises should be made here." Thanks to their good water-binding properties, the new texturates can also be used to create individual consistencies.

www.goodmillsinnovation.com

IFFA Hall 12.1 Stand C24

IFF SAVORY SOLUTIONS DISPLAYS MANY EXCITING INNOVATIONS

The industry comes together again in person – reunion joy guaranteed! Of course, IFF Savory Solutions with the brands WIBERG, Gewürzmüller, Gewürzmühle Nesse and Mühlehof will be there, once again, as a leading specialist on all topics related to taste and function and will inspire customers and partners with new products and innovative ideas.

Vegan Competence

There are many ways to enjoy with a clear conscience. On the one hand, meat in excellent quality, on the other hand in the form of numerous, tasty meat alternatives. Anyone who has always counted on expertise, enjoyment and quality is in good hands with Savory Solutions – even when it comes to plant-based products. The comprehensive products and services range from the introduction of new product ideas to the further development of vegan foods. This results in individual and tailor-made solutions for requirements of all kinds – from established industrial companies to dynamic start-ups.

Less Salt – Full Flavor

Too much salt in our diet can have a negative effect on health. Excessive salt consumption increases the risk of developing high blood pressure, which is subsequently associated with cardiovascular diseases. It is not without reason that health authorities worldwide are calling for the salt content in food to be reduced. At IFFA, Savory Solutions will be presenting trend-setting products that offer full flavor with significantly reduced salt content.

Poultry is Booming

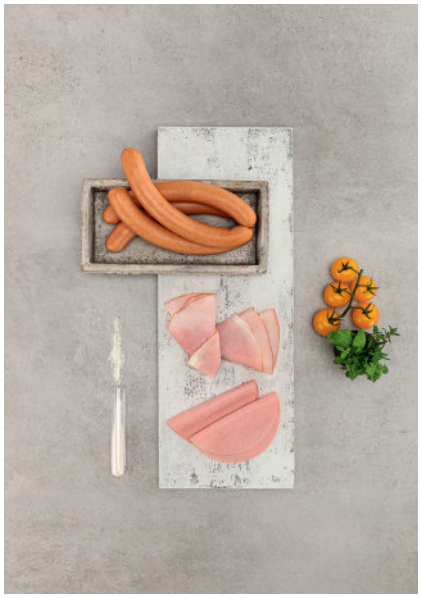
The topic of poultry is as relevant to the food industry as it has been in previous years. And it is still worth betting on this trend to go on, as suggested not least by the OECD/FAO's forecast for the future: It predicts global consumption of around 140 million tons of poultry by 2028 and attributes enormous growth potential to developing countries in particular. Savory Solutions offers all the ingredients needed for the production of high-quality poultry meat products and will also be presenting exciting innovations at IFFA.

From Trend to Customer Favorite: Hybrid Products

Hybrid products are more popular than ever, and the trend continues to point upwards. Not surprising, as they score with many advantages: Due to less meat, they contain less fat and cholesterol than conventional products. At the same time, they are rich in protein and fiber. Many popular meat and sausage products can be supplemented and spiced up with plant-based ingredients.

Food Cultures: Union of Two Leading Brands

Since February 2021, BITEC® and TEXEL®, the two most experienced brands for food cultures, have joined forces under the umbrella of IFF. With more than 70 years of experience, knowledge and innovation in the field of food cultures, TEXEL® offers a wide variety of cultures to meet the needs of the market. The innovative products of the BITEC® range have always stood for safe and user-friendly solutions in meat



production. Both brands offer everything customers need to produce fermented sausages, raw cured products and other foods. The expert know-how and a wide variety of bacterial strains make it possible to produce the most suitable starter cultures for every need.

Deco Quick® - The All-Rounder

The innovative Deco Quick® spice coatings add the finishing touch to a wide variety of specialties, both visually and in terms of taste. Regardless of the flavor – from regional to exotic, from herb garden to curry. More and more consumers are looking for meat-free enjoyment that does not compromise on appearance and taste. That's why Deco Quick® is also ideal for refining vegetarian and vegan products such as plant-based pâtés, cold cuts or vegan cheese. New at IFFA, now there are also fruity flavors in the range.

Savory Solutions Meets Every Customer Requirement

IFF and DuPont Nutrition & Biosciences have joined forces since February 2021 to become the world's leading partner to the food industry. Savory Solutions, as part of the IFF family, offers creative and innovative solutions for both butchers and the food industry. Customers particularly appreciate the new possibilities and the certainty of obtaining a 360-degree portfolio for all requirements relating to taste and function.

www.wiberg.eu/en/iffa

IFFA Hall 12.1 Stand C 40

AVO SHOWCASES A WIDE RANGE OF NEW PRODUCTS

Also a feast for the eyes - the new AVO Lafiness Premium Pink Pepper.

Sausage products with high protein; vegan salad dressings; vegan chicken strips or hybrid products with a reduced proportion of animal fat - AVO responds to all nutritional topics are currently under discussion among consumers. As usual, all the solutions offered by the Belm, Germany-based taste experts are based on comprehensive supply chain documentation in combination with industrially and technically optimised processing quality.

Shrill and Crunchy on the Grill – the New Lafiness Premium Marinade is an Attention Grabber

This season pink is not only the hottest colour for unicorns but also for fashion and cooking. AVO brings the trend colour to the BBQ with Lafiness Premium Pink Pepper. It is based on red pepper – better known to the experts as Schinus mole, the fruit of the Peruvian pepper tree – which provides meat, fish or vegetables with a fine peppery/spicy note. In addition to this, the gently freeze-dried, finely granulated seeds or berries also give a crunch which you can not only feel but also hear when you bite into grilled food. A marinade which has the potential to become tomorrow's classic because it appeals to all the senses and tastes wonderful. Just like all other Lafiness Premium products, customers can put their trust in base ingredients which include high quality spices, finest sea salt and best rapeseed oil.

Protein Alternatives in the Convenience Segment - Vegan Salad Mayonnaise Enhances Vegan Meat Salad!

Vegavo Ready to Mix Chicken Style is AVO's offering for recipes for vegan chicken strips or vegan nuggets. Based on wheat protein, when processed the compound has a firm, fibrous structure and a light, chicken-like colour. This base compound can also be used to produce chunky foods which can be deep fried as well as cooked "meat" or vegan marinated chicken strips.

Vegavo Salad Mayonnaise is the latest addition to the AVO range of meat-free products. Whether to enhance salads or as a dip for vegan nuggets, the new mayonnaise is extremely versatile and can also be used as the basis for the new Vegavo Basic Cream "Meat Salad Style". The cucumbers and onions included in the cream add sweet and sour notes to the creamy basic structure. In addition to the "meat salad" - for example made using the AVO vegan chicken style compound - which gives the product its name, it is also an excellent option for producing other typical BBQ side

Vegan right down to the dressing. AVO enhances salads with Vegavo Basic Cream Meat Salad Style, based on vegan mayonnaise.

dishes such as potato salad for vegetarian and vegan gourmets.

The AVO product range includes additional, non-vegan basic creams such as: Basic Cream Classico Gourmet, Topico Gourmet, Florida Gourmet and Puszta Gourmet. So, whether with or without meat; asparagus salad; sweet potato and avocado salad or potato salad with black garlic dressing, you can use our recipe ideas to create your own dishes or a combination of both!

Vegan Schnitzel Compound Plus Crispy Coating – Guaranteed to Succeed

Now in our product range: Vegavo Ready to Mix Schnitzel, a compound which has been developed as a vegan alternative to classic schnitzel. Just add water and oil to quickly produce a mix which is easy to shape and process. AVO's famous 'success guaranteed' products make it simple to create protein alternatives for your meat counter. Just like all other Vegavo Ready to Mix products, key sales arguments are the stability of the protein mix when heated in a frying pan or on a BBQ plus the meat-like feel when biting into products.

AVO flavoured coatings are particularly recommended in combination with these products, as they ensure a golden brown crust and round off the flavour.

New Seasoning Mixes for Discerning BBQ Experts

The range of beef cuts available on the market keeps on growing, with flank steak or hanging tender joining familiar products such as the T-bone steak.

New avant-garde pork trends from Spain, such as presa, a shoulder steak from the Iberian pig, or the Italian cuscino, a pork blade shoulder cut, are also coming onto the market. AVO offers a variety of new dry seasonings to go with these cuts, especially when BBQing. They include Black Garlic or Black Aged Pepper Red and BBQ Smoked Paprika.

Black Garlic and Black Aged Pepper are already familiar as Premium marinades and have been highly popular since the day they were launched as part of the AVO Lafiness range. A special feature of Black Garlic is the fermentation maturing process used for the garlic. It gives the cloves a unique, deep black colour and an unmistakeable flavour; the garlic taste is milder after cooking. Black Aged Pepper is also fermented, however using sea salt. It originates from Sri Lanka and Cambodia and grows wild in mountain and jungle areas. Harvested by hand and mixed with sea salt, the pepper's essential oils undergo a total transformation during the process, creating a new highly nuanced pepper flavour.

If you are a fan of BBQs, then AVO has all the items which will make your heart beat faster – Black Garlic, Black Aged Pepper Red and BBQ Smoked Paprika dry seasonings plus the Lafiness Premium Pink Pepper marinade.

As its name implies, Smoked Paprika has a smoky flavour which will wow anyone who is a fan of authentic American BBQs. Traditional paprika smoking requires great expertise, since the smoky flavour notes should complement the fruity taste, not overpower it. In line with this, AVO places great value on top quality raw materials to ensure that the final outcome will be an incomparable taste experience.

The new seasonings are perfect not only for beef or pork but are also a welcome upgrade for raw-meat bratwurst, poultry or fish. Or why not serve BBQed potatoes, seasoned with Black Garlic, and vegan meat salad based on Vegavo salat mayonnaise for a perfect vegetarian BBQ evening?

www.avo.de

IFFA Hall 12.1 Stand C 79

THE BARLEY PROTEIN BREWING STORY

By Henk Hoogenkamp

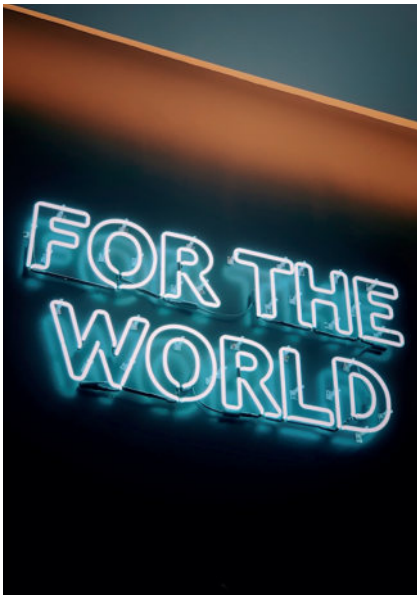
The evolving plant protein and fiber trend present challenges and opportunities for the processed meat industry. Even though health and wellness in processed meat products are not really seen as trending, consumers do pay attention and desire traditional flavor and texture, as well as keeping a clean & natural label.

Currently, the most dominant plant protein ingredients are soy, wheat, and pea. Multiple new plant protein ingredients have been introduced over the last 10 years. While some have intrinsic flaws, others are a great welcome to the toolbox of food formulators. Barley protein is now gaining traction and is creating trade awareness. Consuming foods that are better for health and ecologically sustainable for the planet is often linked with alternative protein sources such as the emerging barley protein ingredients. These "grain solutions" are shifting away from the traditional and often unsustainable animal-based protein and even the heavy-loaded soy sausages.

Barley grains have a long history of inherent goodness which now have evolved in a series of functional and nutritious plant-based ingredients. Especially barley protein is emerging as a challenger for the soy and pea domination.

"Barley flour" is a meaningful option for the world-famous British breakfast sausages. It's "all-plant" equivalents are in need for a protein and fiber-rich bulking ingredient that maintains succulence and texture.

Barley protein delivers a serious punch as a complete protein product, containing all the highly nutritive amino acids needed, as well as showing great application performance and organoleptic properties. The sustainability premise of barley is simple: the



grain doesn't need much to grow and is hailed as a sustainable crop compared to the deforestation-driven soybean cultivation in the Amazon region.

Barley Protein Applications Overview

- British breakfast sausage
- Burgers & Meatballs
- Hybrid formulated meat and savoury snacks
- Extruded protein granules & crumbs

Native barley protein provides emulsifying and interfacial film-forming properties reducing the tension between water and oil droplets. The high fat encapsulation efficiency of barley protein is stable at various cooking or retorting temperatures, while it reduces oxidative degradation which may increase the shelf life of both shelfstable and frozen meat products.

These dry-fragmented non-starch barley ingredients have double-boosting performance providing essential proteins combined with the gastrointestinal the benefits of water insoluble dietary fiber for prebiotic health.

The Road to Success

The road to introduce a new plant protein ingredient is quite long. From early introduction to first order can take a minimum of 12 months, although a 2-to-3-year evaluation, testing and validation wait is more realistic. The most likely way forward is to offer food companies alternative protein solutions that clearly give application performance and cost benefits.

Although new introductions of plant protein ingredients take time before the protein is used in formulated foods and beverages, plant nutrition has a great tailwind that helps the speed of market introduction. Now that plant nutrition is trending, it can be expected that the go-to-market time for both native and soluble barley protein will be on a much shorter trajectory. Of course, the

introduction of a new plant protein ingredient still requires flawless marketing strategies in all areas of execution: application, health capabilities, as well as pro-active and solution-driven, product availability through distribution channels and competitive value propositions.

Plentiful Global Resources

EverGrain is on a mission to redirect barley spent grain nutrition into valuable protein ingredients. The company has a broad barley-based ingredient portfolio and is gaining recognition by using science-enabled solutions for tasty, healthy and sustainable food applications.

A rough estimate of the global availability of barley-spent grain is 9 million metric tons. This enormous quantity translates to a potential of about 3.4 million metric tons of functional barley protein. Through its association with AB InBev, EverGrain can access every year some 1.4 million metric tons of spent barley via the beer brewing process. This makes brewers spent barley an ideal upcycle grain showing a high bioavailable nutritional profile. The very first barley protein isolate facility is now on stream in St. Louis MO while the Belgium factory is not far behind.

The four pillars on which plant protein ingredients build are great taste/flavor, function, nutrition, and cost. Exploring innovation-driven research to improve taste, texture and color is therefore a main part of the transformation needed to feed a growing global population sustainably.

Going forward, it is anticipated that protein ingredient certifications will become a main qualifier for formulated foods, including displaying packaging label claims. The same is true for signaling protein ingredients with important parameters such as carbon footprint, water & land use, and avoidance of deforestation. Both upcycled nutrition and performance, as well as ecological sustainability will move forward in tandem to meet the increasing global demand for plant protein ingredients.

There is no doubt that plant protein-formulated foods and beverages are getting more essential for

the health of both humans and planet Earth. Besides soy and pea protein, the most interesting emerging plant proteins are mung bean, fava, chickpea, oat, barley, canola and sunflower. Plant proteins need to not only fulfill important parameters such as yield per hectare, land availability for cultivation, water requirements, and fertilizers, but also take the protein properties and their sidestreams into consideration.

Upcycling Performance

Barley is a pragmatic choice to convert spent grain into an emerging source of new plant protein solutions for use in a wide range of formulated food products. Seen from this perspective, barley is a welcome source to help alleviate possible future supply-chain protein shortages for a world that is in urgent need to transition into more sustainable food choices.

The residual side-stream protein still has unique features as these components can be naturally captured and modified for upstream protein and fiber solutions for many foods and plant meat applications.

The future posterchild of plant-based products is the ongoing transition of barely grain and spent barley grain into a premium organoleptic and nutritional ingredient.

Barley, and especially barley-spent grain, is emerging as a formidable alternative to the current selections of plant protein sources of soy and pea. Beer-brewing companies around the world have vast amounts of barley-spent grain available that otherwise will be sold as a source of high-protein feedstock.

In recent years, barley spent grain has undergone a "trash-to-treasure" transformation and proprietary technology refinements now allow valuable macro- and micro components to be captured for use in a wealth of food products, including beverages and plant meat foods.

Protein Recovery Methods

Both physical and chemical methods can be used to obtain the separation of the various compounds that are embedded in the plant substrate. Chemical processing entails the use of a sequence of treatments that involve temperature, pH, alkaline, acids, as well as enzymes to modify protein performance.

Physical separation is a time-tested process with dry/air fragmentation and follows steps such as de-husking, sieving, heat stabilizing, and final grinding. Physical plant treatment systems are usually most cost efficient. Because of the high demand for "green & clean" food labels, air fragmentation has become a popular choice to maintain the all-natural characteristics of the individual plant protein or plant fiber ingredient.

The arrival of barley protein ingredients at the world scene can be seen as a functional plant protein alternative across the entire value chain that will ultimately provide consumers with a great-tasting, nutritional and environmentally sustainable product. As protein know-how moves ahead, it is expected that emerging technologies like gene editing and artificial intelligence (AI) will speed up performance improvements such as water binding, fat binding, and color, flavor and taste sensations.

More than Just Protein

One of the main problems for companies that promote plant protein ingredients is to find commercially viable options to successfully sell the remaining carbohydrates and fiber. The valorization of these components often makes or breaks the successful business case for the protein component. The latter is the main reason why soy is leading because its high oil content as well as the lecithin are in great demand globally.

Fine Tuning by Design

The use of enzymes -such as protease, amylase and bromelain- is also termed hydrolyzation which is the process of cutting or splitting the protein chain into predetermined chain lengths. As a rule of thumb, the higher the enzyme dosage and the longer the incubation or holding time at preset temperatures, the higher the protein or separated amino acids content. Yet, a possible negative side effect of longer incubation is that amino acids and peptides are formed with a bitter note. Seemingly small processing changes can have significant influence in the protein performance such as being easy dispersible, gelling- and emulsification properties.

Many plant protein ingredients have undesirable flavors, like earthy or beany notes. Barley-spent grain has a light sweet taste that needs little masking to deliver authentic flavor in formulated food. The patented processing and technology deliver a premium quality barley protein ingredient that is both nut and lactose free.

The arrival of designer enzymes now allows the target and modification of the specific functionalities of plant protein ingredients. Most of these protein changes in performance and properties are:

- Reduced bitterness
- Create umami flavor
- Create bioactive peptides
- pH acidity stability
- digestibility
- dispersibility
- solubility
- reduced allergenicity
- gelation
- emulsification
- salt sensitivity
- temperature stability
- salt tolerance
- non-dusting
- non-lumping

A Welcome Biodiverse Protein

Protein is essential to proper nutrition. Barley protein is a single ingredient offering dual-function solutions for improved nutritive value and formulation challenges. Barley protein is an excellent source of essential amino acids, and especially the branched-chain amino acids (BCAAs) are considered impressive. Barley protein therefore compares favorably to whey protein and, when blended with whey protein and/or infused with lysine of leucine, a DIAAS of 1.00 can be reached.

Beer brewing removes the soluble carbohydrates, hence most insoluble nondigestible fiber remains. These remaining fibers are closely intertwined which promotes good intestinal health with little or no bloating and other digestive problems. One of the main advantages of barley-spent grain is that most of the starch component is already removed during the beer brewing process. This will greatly improve the economics of scale. Barley-spent grain has significant cost advantages compared to soy and pea protein.

A Flashback

The introduction of a new functional or dietary plant protein ingredient can have a long timeline. Take for example, soy protein concentrate or soy protein isolate, which first became available in 1954 but only gained global success in 1990 when the price of dairy casein became prohibitive for use in processed meat products. Later examples are pea protein and potato protein. It has taken the initial pea protein companies at least 20 years to finally gain recognition and market breakthrough.

In 2010, pea protein became the darling of the consumer sympathy simply because of the negativity surrounding soy protein blamed for irresponsible growing practices such as destruction of wildlife and deforestation, not to mention the botched attempts to elevate soy proteins as a pseudo-pharmaceutical ingredient for heart health, cancer and alleviating PMS in women.

Potato protein had a very slow start and became close to folding the business. Fortunately, potato protein arrived at Impossible Foods just at the right time in their search for a gelling protein that could duplicate the properties of whey protein. The rest is history: potato protein is now in high demand and with limited global availability, this plant protein commends astronomical high pricing.

The Main Factors Driving this Ecological Protein Transition are:

- animal welfare
- wellness & lifestyle (fashion, trending, social media)
- environmental concerns, including climate change concerns

The younger generation of consumers prefer food and beverage products that are made with sustainable ingredients that they recognize and trust. The plantbased barley grain has positive name and health perceptions with all the ace-cards to become trending in a diverse range of applications such as sausages, burgers as well as the plant-based meat alternatives.

Plant Choice

When everything is said and done, for most plant protein ingredients the cornerstone of its business is still usage in processed meat products and plant meat foods. Basically, the plant protein ingredients are either used as a dry powder to build emulsion structure and/or in extruded form as an alternative for ground lean meat replacement. It is important to distinguish two entirely different market segments for these plant protein ingredients: in many countries textured plant protein ingredients are used to aggressively reduce food costs by replacing expensive lean meat. For example, the Burger McDo is the best-selling hamburger at McDonald's Philippines showing a plant protein inclusion level well over 50 percent. These types of products are typically described as "hybrid" i.e., a blend of lean meat and hydrated textured plant protein.

For plant meat foods the objective is not primary driven by food cost reductions, but rather answering to the sharply increasing consumer categories for vegetarian or vegan lifestyle choices, including dietary, ethical, animal welfare and sustainability concerns

Barley Texturizing Solutions

EverVita Prima is a "clean label" and non-GMO vegan barley protein offering functionality that are made through a mechanical process via upcycling what was once seen as a by-product of the beer-brewing industry. EverVita can improve viscosity and enhance moisture retention and freshness prolongation in a wide range of foods, while boosting structure and texture in plant-based meat alternatives. Both in coarsely and emulsified meat and plantmeat products the water holding capacity of the EverVita Prima brand is 1:3.5.

The EverGrain company mission is to expand the plant ingredient portfolio with a range of high-quality barley protein products. EverVita Prima brand barley protein ingredients are "beer native" proteins that have been made using dry fragmentation showing a protein content of 38 percent. These ingredients are both available in powder, as well as in extruded form to build structure, mimicking meat texture and moisture release. Extruded products have a wide range of ingredient options, including combinations of barley protein and wheat gluten, providing lowcost options for both processed meat and "plant-meat products. ■

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IMA ILAPAK RUNS WITH RECYCLABLE FILMS

At IFFA, IMA ILAPAK, the leader in packaging machines for flexible films, will introduce new solutions that enable meat, fish and poultry producers to package their products more sustainably without compromising on line speed, presentation or shelf-life. As well as demonstrating how processors can down-gauge material usage by 30-50% by switching from thermoforming to flow wrapping, IMA ILAPAK will present its capabilities in running fully recyclable paper-based and mono-polymer films.

While meat, fish and poultry producers are committed to making their packaging more sustainable, the dilemma they face is deciding on the best strategy - do they go down the compostable route, the paper-based route or the recyclable plastic route? For multi-national companies the matter is especially complex as not all countries are aligned on their regulations and waste management approaches. In Germany, for example, paper-based packaging needs to have a minimum cellulose content of 95% to be recycled, whereas in Italy and Spain the threshold is far lower. Similarly, while Italy has invested in provision for industrial composting, in the UK there is no such infrastructure.

Staying Ahead of the Curve With OpenLab

IMA ILAPAK has been following developments closely and, at its OpenLab proof of concept facility, its material scientists been busy testing and analysing new paper-based, mono-layer and compostable films from a range of suppliers. Much of their work is pre-emptive testing of new films before they are even available on the market.

"By analysing the mechanical, thermal, tribological and processing properties of these next generation films, we have built up an understanding of how they will perform in different applications and how packaging lines will need to be adapted to accommodate them," explains Davide Paltrinieri, OpenLab Manager and Material Technologist at IMA ILAPAK.

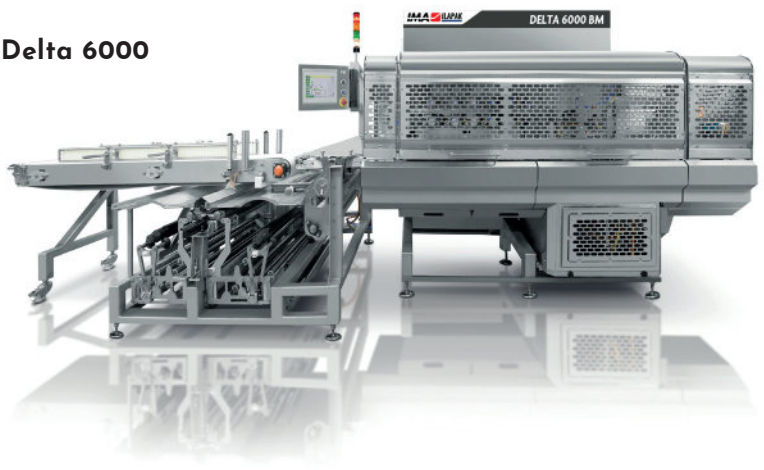
"All of our analysis is catalogued in a database, so that when a customer wants to switch to a more sustainable film but doesn't know which material to use, we can consult our database and make starting recommendations from there," he adds.

Another major advantage of the OpenLab approach is that it cuts the trial, error and downtime out of introducing new films. Instead of having to interrupt production to test new films, films can be trialled within OpenLab's testing area, on identical equipment and in conditions that emulate real-life meat processing.

As well as supporting customers with their material selection and testing, OpenLab serves as a valuable resource for informing machinery R&D. For the last few years, IMA ILAPAK's equipment technologists have been working continuously on modifications to its flexible packaging systems to keep pace with sustainable film developments and cope with less wrapper-friendly mono-layer and paper-based materials.

Recyclable Paper-Based Films

Paper films are notoriously difficult to run on flow wrappers because of their structure. In order to maintain sufficient sealability, flexibility and gas, water vapour and grease barrier properties, they have a micro-layer of plastic. Applying heat evenly to obtain an hermetic seal in an efficient way throughout this structure is difficult to achieve due to the thermal insulating properties of the top paper layer. IMA ILAPAK has overcome this by deploying special geometry surface treated sealing jaws in conjunction with the use of its consolidated long dwell technology which is able to



Delta 6000

guarantee uniform and efficient sealing of paper-based packaging materials.

Paper-based films are also challenging to work with from a forming perspective, requiring gentler handling and a longer folding section. A new patent-pending folding box system that prevents paper films from tearing provides a solution to this issue whilst ensuring processing speeds are not compromised.

Mono-Polymer Materials

The challenge with running recyclable heat-sensitive mono-material PE and PP films is that they have a narrow heat sealing temperature range and so a longer dwell time becomes essential to prevent the film from melting and sticking to the sealing jaws. In order to maintain high speeds whilst increasing the dwell time, IMA ILAPAK has engineered dedicated solutions on its sealing heads and surface treatments on its jaws.

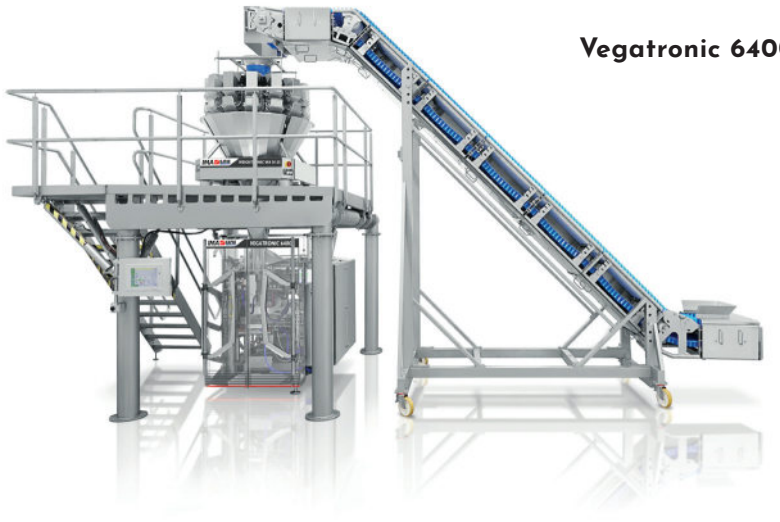
Application Examples

These solutions can be applied across IMA ILAPAK's horizontal and vertical packaging machinery portfolio, enabling meat and poultry processors to make the switch to fully recyclable packaging: IQF burgers can be packed in 100% recyclable PE mono-films on the Carrera 6000; salami, chorizo and other cured and cooked meats can be MAP flow-wrapped in recyclable paper or plastic mono-material on the Delta 6000; and the Vegatronic 6400HD can run off mono-material PE pillow packs for frozen chicken nuggets or scampi.

Quest for Quick Changeover

Now, the focus of IMA ILAPAK's R&D is shifting from whether these emerging materials can be accommodated to how quickly packaging machines can switch between materials with different characteristics.

"Our ultimate goal is to handle every type of film on the same machine with minimal changeovers and negligible changeover time. We have reached the point where we can handle new sustainable materials as well as traditional plastic films on the same machine thanks to the development of quick release parts and flexible sealing systems," notes Andrea Boccolini, IMA ILAPAK's VFFS Division Product Manager.



Vegatronic 6400

Universal Ultrasonic Sealing Technology

Whilst modification of conventional heat sealing systems is one approach, the best solution to the challenge of adapting to new generation films is to seal ultrasonically, as this universal sealing technology can handle potentially any kind of heat sealable packaging material.

Despite this advantage, and the technology's ability to guarantee pack integrity by sealing through juices and contaminants in the seal area, the meat and poultry industry has yet to embrace ultrasonics. Anticipating a move to ultrasonic sealing in the near future, IMA ILAPAK can incorporate predisposition for ultrasonic sealing into any flow wrapper and vertical bagger as a future-proofed solution for manufacturers.

Flowing Away from Thermoformed Packs

The quest to improve the sustainability of their packaging is leading many meat and poultry manufacturers to seek out alternatives to conventional film lidded thermoformed trays. Not only are most thermoformed trays unrecyclable due to their multi-layer structure, they are also heavy on materials usage (the tray typically ranges on average from 200 to 600 microns while the lid film is around 50-70 micron).

This is where IMA ILAPAK's Vacmap technology - available on its Delta series of flow wrappers - comes into play. Incorporating both gas flushing and vacuum technology, Vacmap can match the shelf-life performance of a thermoformed pack, but with huge

potential for material reductions: a flow-wrapped pack uses on average 30-50% less packaging material than a thermoformed tray-film combo uses. In addition, the overall cost of manufacturing is considerably lower as flow-wrapping is a far simpler process than thermoforming and requires just a single operator.

For cured or cooked meats such as sliced ham or salami, this down-gauged pack can even be constructed from a gas barrier paper film - with a cardboard back card for support - for a fully recyclable solution.

A Fresh Format for Portioned Packs

Fresh meat and poultry is another area where thermoformed packs have historically been the format of choice. Paper-based flow-wraps aren't an option in this 'wet' application, but high barrier mono-material films extruded from PP and PE are. Using Vacmap technology to guarantee shelf-life, these recyclable films can be combined with either a paper or PE tray to provide a fully recyclable alternative to film lidded thermoformed trays for products such as minced beef, chicken breasts and diced lamb, for example.

Hygiene High on the Agenda: Vegatronic 6400HD bagger for IQF Proteins

While sustainability is grabbing the headlines, hygiene is a continuous thread in packaging machinery design for the meat, fish and poultry industries.

At IFFA, IMA ILAPAK will demonstrate how it has married the protein industry's requirements for sanitary design with efficiency and accessibility in the Vegatronic 6400HD. This ultra-hygienic bagger was first launched in 2019 to deliver best-in-class hygiene and maximum uptime when packaging frozen meat products such as nuggets, burgers, chicken pieces and sausages.

Industry-leading hygiene is guaranteed through a number of design features on the Vegatronic 6400HD: all major parts are constructed from stainless steel, including the film carriage and machine frame, and minimal flat surfaces and rounded components prevent debris from accumulating. To enable full washdown, all electronic and electrical parts are sealed to IP66 or above; the cabinet is IP67 rated and the jaws are IP68. In addition, the machine's open frame design gives unfettered access to the inner workings of the machine for cleaning and maintenance purposes.To maximise uptime, IMA ILAPAK has focused on re-engineering parts like the forming tube, film reel and sealing jaws for quick and easy changeovers.

Following feedback from the field, IMA ILAPAK's engineers have fine-tuned its design to deliver enhanced performance. Previously unseen improvements include 'all in one' sealing jaws that are capable of handling a broader variety of materials, redesigned hygienic safety guards and a tubular stainless steel frame construction that can withstand vibration.

The Vegatronic 6400HD bagger on show will be configured with a WA16 25 MB (Memory Bucket) multihead weigher in an embossed execution for frozen food.

Joint up Thinking

Last but not least, IMA ILAPAK will present its equipment solutions for larger joints of meat such as whole birds, deli hams and sides of beef. The new Delta RotaVac system seamlessly integrates ILAPAK's Delta 6000 flow wrapper with an innovative rotary vacuum chamber. This has created a highly efficient, hygienic, labour saving solution for replacing pre-made shrink bags with lower cost film from a reel.

Meat the Makers

Members of the IMA ILAPAK team will be on hand to answer any questions visitors may have about packaging meat and poultry. As well as offering stand-alone machines, IMA ILAPAK can supply turnkey and full-line solutions. Being part of the IMA group gives ILAPAK access to expertise and technology spanning the full flexible packaging equipment chain, from cartoning to case packing.

www.ilapak.com

IFFA Hall 11 Stand B 59

KREHALON HIGH QUALITY SHRINK BARRIER PACKAGING PLAYS ITS PART TO CONTRIBUTE TO A MORE SUSTAINABLE WORLD

Krehalon's core focus is to preserve the quality of fresh food whilst maximising shelf life and presentation appeal. By doing this, it contributes to reducing food waste, and the associated carbon footprint.

Krehalon is a manufacturer and distributor of high-quality, PVDC-free flexible shrink barrier films and bags. Its recycle-ready products are for the fresh red meat, processed meat, poultry, seafood and cheese industries. More recently, Krehalon has extended its portfolio to include solutions for alternative proteins.

Headquartered in the Netherlands, Krehalon has regional offices to serve its direct markets across Europe and in Australia, and has an extensive distribution network across the globe.

Krehalon uses patented technologies, market-driven expertise, and extensive product knowledge to develop innovative solutions that meet customer needs. Due to the packaging product quality, solutions offer appealing commercial benefits too. Krehalon products can be thinner and stronger than comparable market offerings – an obvious attraction as the developed world tries to reduce plastic usage. High-quality hermetic seals reduce pack leakers, so there is less wastage of both product and material, which increases production efficiency.

Krehalon takes its membership to CEFLEX, UK Plastics Pact, REDcycle™ and Recoup seriously. As such, more solutions are now CE- and REDcycle™ compatible, with recycle-ready products and products that contain PCR available.

Proven Portfolio

The ML40 multilayer shrink bags range comes in a variety of barrier thicknesses, depending on application. A popular Krehalon product is its puncture resistant packaging, ideal for the most demanding high abuse applications (e.g. bone-in red meat).

With increasing pressures in the food industry, the automated Shrink Bag Replacement (SBR™) solutions – Formshrink® and Flovac™ – are interesting options. These offer impressive labour savings, giving production managers more staff allocation flexibility on the production floor. SBR™ solutions provide increased production efficiency since there are less pack leakers so less material and product wastage. Further material savings can be made since customers have the option to print their bespoke designs directly on our material, since Krehalon has a 10-colour flexographic printer inhouse.

www.krehalon.com

IFFA Hall 11.1 Stand B 20

"GO SUSTAINABLE!" WITH SEALPAC

Powerful, Flexible and Efficient Traysealers and Thermoformers for Resource-Saving Packaging Concepts

The sustainable FlatMap® packaging concept will be one of the highlights at the stand.

SEALPAC made optimal use of the break caused by the Corona pandemic to further develop its traysealers and thermoformers, as well as modern packaging solutions. Under its motto "GO sustainable!", the company presents a whole range of innovative technologies and concepts for food packaging, which address the global contemporary requirements for more sustainability at retail.

Sustainable Packaging, Reliably Processed

At the SEALPAC stand, trade fair visitors can experience the latest packaging solutions based on three traysealers and two thermoformers. These solutions increasingly rely on mono materials for improved recycling, are characterized by reduced film consumption, and process alternative materials such as paper into safe and attractive packaging. Among other things, SEALPAC will present a complete line for the production of the resource-saving FlatMap® packaging concept for sliced products, based on a minimum amount of plastic and a high proportion of cardboard. The company will also demonstrate a thermoforming solution for high-speed packaging of burgers in recyclable film, as well as its brand-new, extremely modular PRO thermoformer. Another highlight at the SEALPAC stand will be the ability to take a journey along international packaging trends. At its "Supermarket of innovations", SEALPAC and its scouts have tracked down the latest trends around the world that will inspire trade fair guests with creative packaging ideas.

The innovative Amax traysealer brings performance to the maximum.

The modular PRO thermoformer excels in flexibility and smallest footprint.

SEALPAC Amax Traysealer

With the launch of the Amax-series, SEALPAC is setting new standards in terms of performance in tray-sealing. These traysealers, which can be operated intuitively and have a particularly low-wear and low-maintenance design, are driven by high-quality servomotors that ensure an extremely smooth packaging process. Depending on the application, the output of these machines can now be up to 50% higher. The integrated EnergyManager ensures minimum energy usage, whilst applying servo technology reduces the air consumption by up to 90 percent. Each model within the SEALPAC Amax-series demonstrates maximum flexibility and is capable of producing a wide variety of packaging concepts, including particularly innovative solutions that stand for more resource conservation. They reliably process new types of film made from sustainable materials, as well as hybrid packaging concepts with a reduced plastic and high cardboard content, such as eTray® or FlatMap®. Last but not least, the Amax traysealers are perfectly suitable for handling ultra-light trays, the weight of which has been reduced by 25 percent compared to conventional trays.

The intelligent drive management of the SEALPAC Amax traysealer reduces the maintenance effort and thus ensures optimal availability at all times. All in all, the new series stands for particular efficiency and economical energy consumption, whilst producing highly attractive primary packaging that will boost sales.

SEALPAC PRO Thermoformer

Also within SEALPAC's portfolio of highly flexible thermoformers, the focus will be on improved sustainability and resource conservation. These innovative machines reliably process all standard materials, including the new, recyclable rigid and flexible films made from mono PP, as well as innovations such as paper-based film. Each thermoformer stands for first-class properties in packaging design, hermetic sealing and user-friendly opening behavior.

At IFFA 2022, the expert audience will be able to witness the launch of the new PRO thermoformer, which offers unmatched compactness, flexibility, modularity, and efficiency. This thermoformer can be easily configured to the customer's specific needs. It starts with the basic PRO machine, which is suitable to run flexible and rigid film for vacuum packaging and sealing only applications. Depending on the customer's wishes, various modules can be added to run other packaging solutions, such as the MAP module for modified atmosphere packaging, the ThermoSkin® module for skin packaging and the ShrinkStyle® module for shrink packaging. Add-ons are also available for heavy products and wet & crumbly products. If the customer plans to connect the PRO thermoformer to its factory software, the Connectivity module can be selected.

The PRO thermoformer is perfectly suited for a wide range of products in varying outputs. If desired, customers are able to run all different packaging systems, be it vacuum, skin, shrink or modified atmosphere packaging, on the same base machine. Switching from one concept to another is made easy with a variety of exchange systems, such as the standard side exchange for the bottom tool in the forming and sealing station. If required, even the film width can be changed in the future.

www.sealpacinternational.com

IFFA Hall 11.0 Stand D11

MEAT PACKING GIANT SLASHES PLASTIC AND CO2 USAGE BY OVER 50% WITH THE FUJI ALPHA 8 FLOW WRAPPING SYSTEM

Paramount Packaging Systems, the UK and Ireland's sole supplier and distributor of Fuji's best-in-class range of flow wrapping machinery, has been assisting their Fuji colleagues in Europe to introduce a new packaging infrastructure to Aldi (Germany)'s range of fresh meat. This innovative solution will save Aldi Germany more than 50% of the plastic and CO2 it has historically used for its packaging.

With Paramount Packaging Systems' experience built on a previous installation in the UK for packing minced lamb, a number of new packaging systems have been implemented by Aldi's supplier and German meat giant, Tönnies.

The new systems use 70% less plastic than traditional tray packaging, reduces transport costs by 80% and minimises CO2 emissions by 60%.

Aldi (Germany) is serious about its sustainability strategy, so "although the changeover to this new system is costly, we are prepared to invest tens of millions of euros, to help solve sustainability issues for our customers" Tönnies declares.

Aaron Bessell, Sales Director at Paramount Packaging Systems, commented "due to the unique way Fuji and Fuji's distributor network communicate sharing innovations and successes, it is great to see the information being used by our colleagues to advise their customers on how to improve. The first step for Tönnies was to look at minced meat to meet their goal to reduce the amount of plastic packaging used for their products. Tackling other products, such as pork steaks, bratwurst and goulash, is next on the list". The industry-leading Fuji Alpha 8 flow wrapping system was central to the new sustainable infrastructure because of its ability to help save up to 70% of plastic per packaging unit. In addition, the new packaging consists of 100% recyclable film. Its weight is estimated at 4.6g for a 500g pack of meat. There is also a saving of up to 80% on transport costs, which reduces CO2 emissions by more than 60%.

The Fuji FW3710B fully stainless steel Alpha 8 flow wrapper, with its automated infeed, accepts the minced meat directly from the outfeed of the mincer, and with no operator intervention, produces hermetically-sealed packs, which are a necessity when packaging perishable products that benefit from MAP (Modified Atmosphere Packaging) to extend the shelf life and also retain the colour of the meat. Thanks to MAP, the packages are stable, stackable and according to Tönnies, can be used for the entire range.

Tönnies is now in talks with other customers to reduce the amount of plastic packaging used on their products. "When the demand from retailers is there, we will convert further lines, making a further contribution to solving sustainability issues" Tönnies says.

Paramount Packaging Systems, leading Fuji partner, has been instrumental in implementing similar solutions in the UK. "As the environment becomes an ever more important purchasing factor for consumers, it's so important for retailers and suppliers alike to implement more eco-friendly packaging for their products. With the introduction of the plastic packaging tax, we expect to see more businesses, particularly in the UK, move towards more sustainable options" says Aaron Bessell.

According to Clemens Tönnies, Managing Partner of the company, the flow wrap packaging made possible by the remarkable Fuji Alpha 8 flow wrapping system "is nothing less than a packaging revolution for the meat world."

www.paramount-packaging.co.uk.

KP TRAY2TRAY® CELEBRATES ITS SECOND YEAR AND CALLS UPON THE INDUSTRY TO DRIVE CLOSED LOOP FOOD PACKAGING

Klöckner Pentaplast (kp), a global leader in recycled content products and high-barrier protective packaging, celebrates the second year of its award winning kp Tray2Tray® initiative, which works towards creating a closed loop for food packaging. With several regions of their global business now using kp Tray2Tray® flake in their trays and rigid films, they call upon the industry to help drive the initiative further, creating separate recycling and sorting systems specifically for pots, tubs and trays to turn them back into more of the same.

kp has been manufacturing fresh food packaging made with post-consumer recycled PET (rPET) for almost two decades, making them one of the largest consumers of this valuable raw material. National regulations, such as plastic taxes coming into effect in some countries means there is an ever increasing demand for recycled PET. Alongside a post-Covid world that has seen unprecedented price increases of raw materials, energy, transportation and labour costs, it is vital for food packaging manufacturers to secure material to help keep food supply chains affordable. As all packaging producers in food and drink demand recycled material, it is now essential to separate food packaging from bottle flake to meet demand.

With sites around the globe, kp is working to implement kp Tray2Tray® in its operations at every site. Its pilot site in Pravia, Spain is already using up to 30% kp Tray2Tray® flake in a range of its thermoformed products for protein – with qualified certification from RecyClass. Another five sites in the UK, Portugal, Spain and Germany are producing rigid films for form, fill and seal applications using kp Tray2Tray® as part of their extrusion processes, with sister site INFIA also incorporating it into their processes and producing fruit punnets.

In 2021, kp launched "Investing in Better", a broad and ambitious sustainability strategy with ten time-bound and measurable long-term targets. The strategy is built around three main objectives: Close the Loop, Work Smarter and Act Responsibly. Under the Close the Loop objective one of the targets is that by the end of 2025, at least 30% of the post-consumer recycled material in their packaging will be from kp Tray2Tray® material. kp can report that in their second year since the launch of the initiative, 10% of its post-consumer recycled content comes from trays.

www.kpfilms.com

SUSTAINABILITY EXPERT LAUNCHES TRAY-TO-TRAY SOLUTION TO PROMOTE THE CIRCULARITY OF THE TRAYS: THE TRAY REVIVE FROM AMB

AMB Spa, headquartered in San Daniele del Friuli in northern Italy, has established a reputation as one of the leading international suppliers of sustainable solutions for rigid and flexible films. AMB delivers an innovative 'all in one place' approach that covers the complete packaging process: packaging design, prototyping, toolmaking, high-barrier rigid and flexible film production and printing. With its focus on sustainability, the company is committed to finding solutions that close the loop of the circular economy. As part of its overall sustainability strategy, it has recently developed the new AMB Tray Revive which utilizes post-consumer trays to create new trays.

Sustainability in Action

On the basis of the expertise and valuable insights gained through the company's long-standing bottle-to tray recycling solution, it soon became clear to AMB that demand for recycled bottles would divert rPET away from tray solutions. It is expected that the demand for bottle-to-bottle recycling from the bottle industry will use up to 0.5 million tonnes of rPET, therefore causing shortages for the production of recycled tray material. In collaboration with an Italian recycler, AMB launched an initiative to collect the material from post-consumer trays with the aim to promote the circularity of the food PET trays. This material is broken down into flakes which are then used to manufacture a tray-to-tray product. As the demand for PET flakes is continuously growing, European design recycling guidelines for multilayer PET/PE transparent trays are currently being developed.

AMB Tray Revive closing the loop, making packaging as sustainable as possible

AMB's Tray Revive Guarantees High-Performance Quality

To ensure the exceptional quality of the final trays, the raw material comes from 95% of food trays stream and undergoes a strict process of analysis. Post-consumer tray material is processed to avoid contaminations, and the quality of the flakes is then evaluated. AMB assesses the material for its impact on the extrusion process and its mechanical performance. Additionally, the new film is subject to controls that evaluate its optical aspect and quality as well as its impact on the thermoforming process. All these checks ensure that AMB customers can rely on the outstanding quality of the final trays: mechanical performance and thermoforming performance on FFS remain unchanged, and the gauge remains the same as for standard PET/PE or Mono PET. AMB Tray Revive drives the tray recyclability and helps AMB customers to boost their green credentials and attract retailers and consumers, who are increasingly heedful of environmentally friendly packaging solutions.

AMB Tray Revive: The closed-loop solution for sustainability in practice

Minimising the Use of Natural Resources

Recovering used food packaging and recycling post-consumer bottom PET trays has established AMB as one of the leading sustainability experts in the manufacture of packaging. Complying with the European Action plan, AMB are committed to boost the EU market for recycled plastics to 10 million tonnes by 2025, reducing the environmental impact of AMB products.

AMB's all-in-one place approach is matched by the company's end-to-end sustainability drive. The Tray Revive is part of a wider strategy that includes improving collaboration and cooperation among all of AMB stakeholders with the goal of improving and developing the right actions and infrastructure to a sustainable and recycling packaging that works. Once again, AMB demonstrates its commitment to innovations and close the loop initiatives that combine high performance with the necessity of environmental protection.

www.ambpackaging.com

SCHUR FLEXIBLES PRESENTS ANTIBACTERIAL SOLUTION TO OPTIMISE POINT OF SALE HYGIENE

The antibacterial varnish can be applied to a variety of Schur Flexibles products - such as top films or flow packs – and reduces bacteria present on the packaging by 95%. Duda, a polish well-known producer of meats and sausages is using it successfully.

Hygiene and food safety have always been important, but the coronavirus has highlighted the need for greater awareness and vigilance. Consumers have been asked to frequently wash and disinfect their hands, and this has led them to expect a high level of protection at the point of sale. In response to this, Schur Flexibles is offering to apply an antibacterial varnish to a range of its films such as for example top films and flowpacks.

Analysed and Tested for Maximum Safety

The antibacterially coated films by Schur Flexibles can be used for a wide variety of packaging. According to the Antibacterial Activity Analysis Result, the coating reduces the bacteria present on packaging by 95%. The varnish has been tested and confirmed safe for food packaging, including meat, dairy and fish, as well as cosmetics and more.

In Poland, Duda, a well-known producer of meats and sausages, has been using it successfully to demonstrate the company's commitment to responsibility during the pandemic and reassure consumers that handling their products is completely safe.

Hygienic Solutions on the Shelf and at Home

At the point of sales, packets are often touched, picked up and put back. The antibacterial coating helps prevent the transfer of bacteria and puts consumer minds at rest. For manufacturers, no changes to their production lines are necessary. Films coated with this varnish run as smoothly as uncoated films on all machines. In addition, it integrates perfectly into the printing process, ensuring that print quality remains at the same high level as all Schur Flexibles printing jobs.

"Food and consumer safety begins with intelligent packaging solutions. We are the first packaging manufacturer to offer this type of coating to our customers. With this solution, we are supporting manufacturers and retailers in their efforts to optimise hygiene and provide enhanced food safety," explains Joanna Herbst, Commercial product manager conversion at Schur Flexibles.

www.schurflexibles.com

ALTERNATIVE PROTEINS - DEVELOPMENT AND AVAILABILITY

By Hans-Wilhelm Windhorst[1]

News about new start-ups, achieved funding and new products are almost published daily by various platforms, which try to keep track with the remarkable dynamics.[2] For a single scientist it is almost impossible to keep an overview. It is worth noting that the funding for single start-ups have reached millions of US-$, some even achieved hundreds of millions. Obviously, the trust of investors in the successful development of plant-based or cell-based products has increased considerably. Since 2010, the total investment in these new technologies have reached a volume of 7.4 billion US-$. This report will give an overview of the development of alternative proteins and available products.

Extensive Funding is Available

According to a compilation of the Good Food Institute (GFI), 5.9 billion US-$ of investment capital was made available to start-ups which are active in the development or production of alternative proteins in the decade between 2010 and 2020. Ahmed Khan, founder of the platform CellAgri, estimated that in 2021 another 1.5 billion was provided.[3] The available funds were not evenly distributed over the applied technologies. Of the 5.9 billion US-$, start-ups using plant-based technologies shared 4.4 billion, those active in fermentation 1 billion and start-ups using cell-culture 490 million. This distribution has remained stable in 2021, due to the fact that plant-based products are already well established in the market. Only one cultured meat product has received market approval so far, chicken nuggets of Good Food in December 2020 in Singapore. The U. S. start-up Perfect Day also received the market approval for its milk protein.[4] The funding for start-ups using cellular technology is less dynamical because of the still existing technical problems and the high costs resulting from scaling up from the laboratory dimension to large volume production.[5] Funding from the U. S. government or the EU reach only comparatively small values in comparison to investments by investment groups or private persons. In most cases, public funding is limited to research programmes and not available for production. One example is the funding of the United States Department of Agriculture. The USDA funded Tufts University (Medford, Massachusetts) with 10 million US-$ to install the National Institute for Cellular Agriculture. Obviously, the USDA realised the importance of this technology for the food security of a growing global population and for limiting climate change.[6]

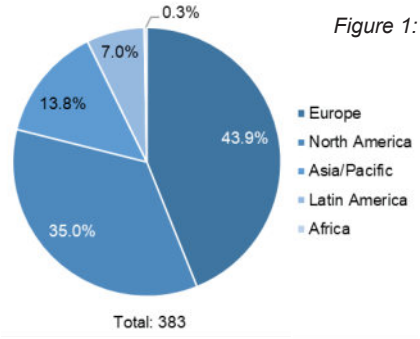


Figure 1:

Start-ups and companies developing plant-based meat substitutes; by continent (Design: A.S. Kauer based on the GFI Alternative Protein Company Database)

Plant-Based Meat Substitutes

In October 2021, the GFI Alternative Protein Company Database listed 807 start-ups and companies, which were active in the development and production of plant-based alternative protein products. Of these, 383 focused on meat substitutes and 326 on milk and dairy substitutes. Start-ups in the development or production of meat substitutes were concentrated in Europe (168) and North America (134) (Figure 1). The comparatively low number of start-ups in Asia is surprising; over the past two years, several new start-ups were

[1] The author is Prof. em. of the University of Vechta and Visiting Professor at the University of Veterinary Medicine Hannover
[2] Such as GreenQueen (https://www.greenqueen.com.hk), VegNews (https://vegnews.com), Vegconomist (https://vegconomist.de)
[3] https://www.cell.ag.
[4] https://perfectday.com
[5] https://thecounter.org/lab-grown-cultivated-meat-cost-at-scale
Humbird, D.: Scale-up economics for cultured meat. https://doi.org/10.1002/bit.27848
[6] https://www.newfoodmagazine.com/news/157542/usda-national-institute-cellular-agriculture

founded, however. Table 2 lists the fifteen leading countries. With 118 start-ups, the USA rank in an unchallenged top position, followed by the United Kingdom, Germany, Brazil and the Netherlands.

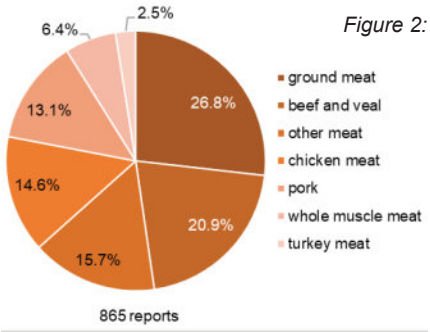


Figure 2: Reported plant-based meat types by start-ups and companies (October 2021) (Design: A.S. Kauer based on the GFI Alternative Protein Company Database)

An evaluation of the GFI database regarding the favoured meat type reveals that obviously not all start-ups were willing to report the meat type, which they were developing or producing (Figure 2). One reason for their restriction may have been that they were still experimenting with several meat types, another that they feared competition disadvantages. A considerable number of start-ups only reported ground beef or whole muscle meat. Of the reported meat types, beef and veal ranked in first place, followed by chicken meat and pork. The lading position of beef results from the focus on hamburger patties. Surprising at first glance is that 22 start-ups deal with turkey meat substitutes. They are concentrated in Europe and North America, the only continents in which the consumption of turkey meat is of importance.

The 383 start-ups in total reported 865 meat substitutes, which they were either developing or producing. Some start-ups were focused on one meat type only whereas most of them experimented with several meat types. It is estimated that in the first half of 2021 more than 3,000 meat substitutes were either available in retail stores or online. Their number is growing continuously.

that 16 of them were located in the USA, followed by the United Kingdom, Israel and Germany.

Table 3 documents a classification of the start-ups regarding their achieved meat type. The reported number is higher than that of the start-ups as some of them experiment with several meat types. Not all of them reported their favoured meat type but only declared that they wanted to produce whole muscle meat or that they planned to produce ground meat or only reported "other meat".

Country	Start-ups	Share (%)
USA	118	30,8
United Kingdom	36	9,4
Germany	33	8,6
Brazil	22	5,7
Netherlands	21	5,5
Canada	16	4,2
France	10	2,6
Japan	10	2,6
Italy	10	2,6
India	9	2,3
Spain	8	2,1
Sweden	8	2,1
Singapore	8	2,1
Israel	8	2,1
Australia	7	1,8
and 24 other	59	15,5
Total	383	100,0

Table 1: The fifteen leading countries with the highest number of start-ups active in the development and production of plant-based meat substitutes (October 2021) (Source: GFI Alternative Protein Company Database)

Cultured Meat

In contrast to the large number of start-ups, which develop or produce plant-based meat substitutes, the number of start-ups active in cultured meat is comparatively low. In October 2021, the GFI database listed only 56 start-ups in 17 countries. Table 2 shows

Regarding the meat types, beef and veal ranked in first place, followed by chicken meat and

Country	Start-ups
USA	16
United Kingdom	6
Israel	5
Germany	4
Australia	3
Japan	3
Singapore	3
South Africa	3
France	2
Canada	2
Netherlands	2
Spain	2
5 other	5
Total	56

Table 2: Start-ups active in the development of cultured meat (October 2021) (Source: GFI Alternative Protein Company Database)

Meat type	Reported meat type
Whole muscle meat	21
Ground meat	14
Other meat	10
Beef and veal	15
Chicken meat	6
Pork	4
Total	70

Table 3: Favoured meat type by start-ups active in cultured meat (October 2021) (Source: GFI Alternative Protein Company Database)

pork; the same ranking as with plant-base meat substitutes. A detailed analysis of the websites reveals that only a few start-ups plan to produce structured meat (steaks, breast filets).

Considerable Differences in the Regional Availability of Funds

A survey, published by the market research institute ID TechEX[7] regarding the development status of cultured meat production and funding on a regional basis showed that of the globally available investment capital 57 % was shared by North American start-ups, 21 % by European, 17 % by Western Asian and only 5 % by start-ups located in the Asia-Pacific region. It is obvious that start-ups in Asia, with the exception of Western Asia, are still considerably underfinanced. In Western Asia the available capital is almost completely concentrated in Israel.

Hot Spots and Top Start-Ups

Although start-ups and companies, which are developing or producing alternative protein products, either plant-based or by using fermentation respectively cell culture technologies, are to be found on all continents, four hotspots can be identified. These are California, Western Europe, Israel and Singapore. Undoubtedly, the San Francisco Bay area was the innovation centre with some of the leading start-ups in the development of alternative protein products (Beyond Meat, Impossible Foods, UPSIDE Foods, BlueNalu, Eat JUST), but Israel and Singapore are disputing their leading position in the development of cultured meat. For their remarkable dynamics, food security is of utmost importance. The government of Singapore passed a strategic programme, which has the target to produce 30 % of the domestic food demand by 2030 within the boundaries of the country. This cannot be achieved with conventional production methods. To reach the target, financial means are made available by the state-owned investment company Tamasek.[8] In addition, the Singapore Economic Development Board attracts start-ups and companies to build research laboratories or production sites in Singapore. Several start-ups and technology companies followed the invitation. Good Food, a subsidiary of Eat Just, is building a production site for their chicken nuggets.[9] Bühler and Givaudan installed an innovation centre for plant-based products, which can be used by start-ups for the improvement of their products.[10] The most successful start-up, which has its headquarter in Singapore, is NextGen Foods. It was founded in 2020 and within only one year was able to increase production and market penetration in Singapore and adjacent countries with its product TINDLE (chicken meat).[11]

Over the past years, Israel has also shown a remarkable dynamics in the development of alternative protein products. In April 2021, 31 start-ups were listed, five using cell culture technologies, nine using fermentation and 18 developing or producing plant-based products. Nine research institutes support the start-ups. More than 200 scientist contribute with their research to the continuous improvement of production technologies and product quality. Top positions internationally hold TECHNION (Israel Institute of Technology), the universities in Tel Aviv and Jerusalem as well as the Ben Gurion University in Be´er Scheva. Start-ups and research institutes are supported by the Israel government, the Ministry of Agriculture and Rural Development and the Ministry of Foreign Affairs. In co-operation

7 https://www.idtechex.com/en/research-article/cultured-meat-a-global-perspective/25069
8 In November 2021, Tamasek reported the foundation of the Asia Sustainable Foods Platform. This platform will support start-ups and companies in the development of technologies for the sustainable production of food, especially alternative protein products. https://www.greenqueen.com.hk/temasek-asia-sustainable-foods-platform.
9 https://www.fooddive.com/news/eat-just-cultured-chicken-investment-increases-to-267m/600354
10 https://www.buhlergroup.com/content/buhlergroup/global/en/locations/Singapore/InnovationCentre_Singapore.html
11 https://nextgenfoods.sg
https://www.bloomberg.com/news/articles/2021-02-25/temasek-makes-rare-seed-investment-in-plant-based-chicken-maker

between government offices, science and economy, a long-time plan for the development of alternative proteins was passed with the aim to make Israel the internationally leading country in the development of innovations for the production of alternative proteins.[12] Several start-ups and technology companies achieved leading positions, such as Aleph Farms, Super Meat, Redefine Meat[13] and Future Meat Technologies.

In Europe, top start-ups in producing plant-based meat substitutes respectively in developing cultured meat are Mosa Meat, Meatable and The Vegetarian Butcher in the Netherlands, The Meatless Farm and THIS in the United Kingdom, Cubic Foods and BiotechFoods in Spain, Oumph! in Sweden as well as Like Meat and Veganz in Germany[14]. According to a report by GFI Europe,[15] European start-ups, which are active in the development of cell-cultured products, received 28 % of the globally available funds. This rank is mainly due to Mosa Meat, which alone received more than 100 mill. US-$ in investment capital.

Compared to the centres of research and development in Israel and Singapore, Europe lacks a coherent strategy in research and development of cultured meat. The lasting discussion regarding the labelling of the products as well as the time-consuming process of market approval according to the Novel Food Regulation are reasons for potential investors not to invest in this technology. Without ending the lasting quarrel regarding the product labelling and a simplification of the market approval, the EU is at risk to fall behind the development of cell-cultured or fermented products in other parts of the world.

A Glimpse Into the Future – a Projection Until 2035

Several market research institutes published projections on the future development of markets for alternative proteins. They differ considerably in their time perspectives for the availability of such products. In 2021, the Boston Consulting Group and Blue Horizon published a more realistic assessment of the future role of alternative proteins in global food production.[16]

The authors of the report expect that alternative food products will reach price parity with conventional products between 2023 and 2032. This is an important condition for their market success. Based on an estimated annual growth rate of 3 %, the global demand for proteins will increase from 587 mill. t to 872 mill. t between 2020 and 2035. In 2035, alternative proteins will have a share of 11 % according to their calculations. For alternative proteins, an increase from 13 mill. t to 97 mill. t or 750 % is projected for the analysed time period, based on a calculated annual growth rate of 14 %.

The fast increase is mainly a result of the dynamical development of plant-based substitutes. In 2035, their share will reach 71.1 %; products, developed by the fermentation technology could reach 22.7 %

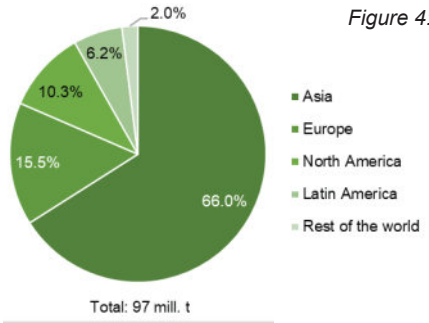
12 https://gfi.org.il/resources/israel-state-of-alternative-protein-innovation-report-2021
13 In November 2021, Redefine Meat presented a plant-based whole-cut printed piece of meat. https://www.timesofisrael.com/israels-redefine-meat-to-serve-3d-printed-plant-based-meat-at-eateries-in-europe
14 Not listed are companies like Rügenwalder or the PHW group, which can no longer be classified as start-ups.
15 https://gfieurope.com
16 bcg-food-for-thought-the-protein-transformation-mar-2021.pdf

and cell-cultured products 6.2 %. The comparatively low share of cell-cultured products reflects the still existing problems, which are connected with the scaling up of production (Fassler 2021, Humbird 2021, Williams 2021). A closer look at the expected consumption of alternative protein products by product classes reveals the dominating role of milk and dairy products for which a share of 55.7 % is predicted, followed by meat with 29.9 %, fish and seafood with 11.3 % and egg substitutes with 8.2 %.

Worth noting is the projection of the development of alternative protein consumption by region. The authors expect (Figure 4) that in 2035 the Asia-Pacific region will account for 66.0 % of the global consumption, Europe for 15.5 %, the Americas for 26.5 % and the rest of the world for 2.0 %.

Surprisingly low may at first glance seem the share of North America. One must consider, however, that in 2035 Europe will have 250 mill. more inhabitants than North America. Latin America will have almost the same population as Europe, but the available personal income will be much lower. If Asia will be able to achieve the projected share will depend mainly on the acceptance of the products in China and India.[17] The acceptance of plant-based products may even be higher in India than in China (Windhorst 2021). Considering the main results of this analysis, it is not surprising that Israel and Singapore are expected to become the leading innovation centres for the development of alternative proteins. ■

Figure 4:



Projected share of the continents in alternative protein consumption in 2035 (Design: A.S. Kauer based on data of BCG-BHG 2021)

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The author is Professor emeritus at At the University of Vechta and Visiting Professor at the University of Veterinary Medicine, Hannover

[17] https://www.greenqueen.com.hk/download-asia-alternative-protein-report-2020

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Online auction Hiperbaric S.A. high pressure processing machine (HPP) in Knetzgau (DE)



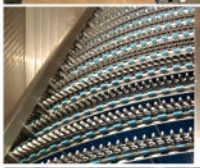

Online auction milk powder blending and packaging lines for bulk and consumer packages and doypack packaging line for volumetric food products in Blonie (PL)





Online auction CFS Powerpak NT 560 thermoformer in Lamerdingen (DE)

Online auction bakery production lines and machinery on behalf of Moilas Oy in Naarajärvi (FI)



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DISCOVER GROWTH OPPORTUNITIES USING COMPETITIVE INTELLIGENCE

Meeting Point Magazine spoke to Aart Schalk, Managing Partner of Linde Consult - strategic advice, market research and project management for the Food Processing Industry, about the advantages using Competitive Intelligence. He presents the new Linde Consult Competitive Intelligence Dashboard, dedicated to the FP&H industry, and explains why companies should start using it right away.

Q: Mr. Schalk, what does Linde Consult provide?

Linde Consult offers strategic advice, market research and project management to the Food Processing & Handling Industry. At the heart of our business lies the Food Processing & Handling Database to which we sell access via a subscription fee. Customers can also opt to buy one-off reports and lists with the data and insights they require.

Q: What does competitive Intelligence stand for?

Competitive Intelligence (CI) is the practice of monitoring, gathering, and analysing data on your competitors and industry to make better business decisions. It can help brands identify gaps in their strategies and discover growth opportunities.

Our mission is to assist clients with strategic advice, market research and project management. Our values are Professionalism and Quality. We focus on the requirements and expectations of the customer and approach every project with a balanced mix of theory and practice. We are fully absorbed in our projects and set the goal of delivering high-quality results.

Q: How can you define your target group?

In the past, primarily enterprise-level companies and industry watchers had the resources to invest in CI like this, but Linde Consult makes it available to companies of all shapes & sizes, and to a much wider user-group:

- Executives can use the data to define strategy and roadmap for growth.
- Sales teams are equipped to fight objections and address pain points.
- Marketing teams can adjust their messaging to better reach their user personas.
- Product Development teams can better understand competitors' solutions & models.

Q: Can you name some of your clients? How do you approach new prospects?

Because of the sensitive nature of our project, we cannot share many details about our customers. Amongst clients are OEMs like Marel, Baader and Peruza; food processors like Biovela, and various large consultancy firms, industry watchers (banks), and investment firms that use our valuable data to analyse the competitive landscape, compare OEM product offerings, view M&A activities, and find opportunities. New clients typically reach out to Linde Consult because they have heard about our database and reports from colleagues in the Industry, but sometimes we advertise or share insights or research results on trends, challenges and future outlook which leads to new business.

Q: What is this Dashboard with Competitive Intelligence for the Food Industry?

The Linde Consult FP&H Database has been in development for 2 years now and includes detailed data on the 250+ most prominent OEMs active in segments Poultry, Meat, Seafood, Bakery, Vegetables/ fruits/nuts, Beverage and Dairy. The level of detail is unmatched!

Users with access can filter through a treasure of relevant competitor data on e.g. industry

segment, company size, revenues, strength of vision, and ability to execute. As well, they can drill down on the product portfolio as marketed by the OEMs and analyse data per processing (sub) step, category, species, to answer specific questions like:

- Which OEMs offer the best Poultry cut-up & deboning solution? What are potential fits/ gaps between product offerings of supplier A, B and C?
- Which equipment manufactured by a Poultry OEM could also be adjusted cross-segment to fit Meat or Plant based requirements?
- Which OEMs are strong in onboard equipment for shrimp grading? How does equipment compare on throughput, no. of operators needed, or price? What are strategic groups, and why are they clustered?
- Which OEMs offer the best End-of-line solutions for the Baking industry, packing & labelling or stuffing & filling? Are they also present in Poultry, Meat and Beverage segments?

The dataset is growing fast, but at the time this is written is contains 10K+ machines and solutions described and scored on technology level, design sophistication and build quality. You can even view estimated installed base, equipment prices, strategic partnerships, ownership, and M&A activities.

Q: What's your competitive advantage? What's your best achievement as a company?

The main competitive advantage of Linde Consult is that we manage the largest Food Processing & Handling Database in the world. It includes 60000+ accounts (600 OEMs and 60000 Food Processors around the world). The OEMs are registered with tonnes of data you cannot find anywhere else. Users of our database get a full overview of the OEMs equipment offerings with loads of variables to slice, dice and filter. To illustrate, uses can filter all sorting machines in segment 'Meat' and processing step 'Secondary processing' on variables 'technology level', 'design sophistication' and 'build quality'. Till now, our best achievement as a company is to have designed and build this database that is now being used by hundreds of users. We are leading the way in defining the Food Processing & Handling Industries best-practise to use market intelligence and hope to assist many clients in the future to optimise their business based on our insights and data. ■

www.lindeconsult.eu

AT VIV EUROPE 2022, MAREL WILL PRESENT INNOVATIONS IN PRIMARY, SECONDARY AND FURTHER PROCESSING THAT ARE ALL READY TO CONNECT FOR SUCCESS

Marel's launches at VIV Europe all share the same central principle: connectivity. Connected solutions in the poultry industry will unleash the full potential of a processing plant. In partnership with customers, Marel has developed innovative processing solutions that enable the acceleration of operations, real-time process control and the maximization of added value. Several groundbreaking premieres in the areas of live bird handling, evisceration, distribution, inspection, convenience food production and software will be shown at VIV Europe.

Digitalized solutions will play a significant role in transforming food processing. Poultry processing systems that communicate and connect to each other can bring important productivity benefits. Marel's expertise in connectivity delivers data-driven decision-making, real-time insight into system performance, end-to-end traceability and optimum production efficiency.

Flock Intake Automation

Usually, the arrival of live birds at the processing plant involves a lot of paper forms and hand-written notes, allowing human errors to creep in. To get rid of this manual process, Marel has developed a software module. This flock intake software enables the automation of data gathering, with minimized human errors and streamlined production flow. The secret here is an RFID chip that can be attached to every tray and pallet of the ATLAS SmartStack transport module. The RFID chip connects all data from farm, flock, truck, driver, weight and process start. The software immediately links this data to the traceability and processing system. In this way, live bird handling becomes an integrated, digitalized process.

Nuova-i operator screen

Intelligent Eviscerator Management

For many years now, Marel has been developing innovative techniques to make its automated solutions more and more intelligent. This not only means that our systems will support processors and their staff to make informed decisions; our solutions are becoming truly decisive and self-adjusting for optimal performance and less labor-dependency. In line with this, Marel's new Nuova-i eviscerator, a major step towards an intelligent primary process. The Nuova-i allows for automated flock adjustments. These can be controlled by a touchscreen, allowing a switch to the perfect flock settings in a matter of seconds. Thanks to the internal machine software, Nuova-i can measure its own performance, allowing real-time insight into each unit. The remote monitoring, evaluation and improvement of performance and status illustrate Nuova-i's connectivity. Even remote support is possible.

IMPAQT operator tablet linelink

Real-Time Primary Processing Insight to Reach Full Potential

Marel makes unique connections to achieve real-time insight into the poultry processing plant's productivity. In the primary process, IMPAQT software program enables

machine-to-machine communication for seamless connectivity upstream and downstream.

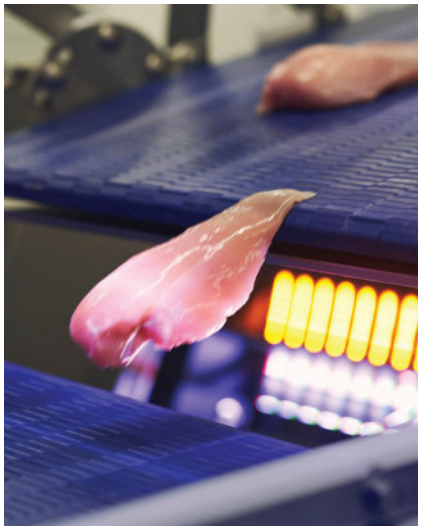
Every poultry processor knows that downtime costs money. Lost revenue, downgraded raw material, idle employee time – there's always room for improvement. Downtime is, however, only one aspect for Marel's IMPAQT software to give insight into the exact causes. IMPAQT is the perfect tool for a complete analysis and improvement of the availability, performance and quality trends of a primary poultry processing line. It reveals the exact reason for any production loss and identifies where to improve efficiency. IMPAQT not only identifies downtime, but can also help optimize the primary processes, while giving real-time insight to reach full potential.

Groundbreaking Breast Meat Processing

On the one hand there are customer orders, e.g. four breast fillets in a fixed weight tray or four schnitzels tray packed; on the other the input material, chicken breasts. How to best match them? Marel has brought together all the necessary hardware and software to ensure the best possible deboned breast meat order fulfillment. The new process sees the incoming raw material and determines which products need to be used for each order to achieve the best performance. Accordingly it sends every individual fillet to its best destination. The result is the most efficient breast meat process.

Unrivaled Soft Foreign Material Detection

Today's consumers expect their food to be of the highest quality.



Spectra

Food industry companies face a continuous challenge to prevent food contamination. In addition to the world-famous SensorX for bone and hard contaminants, Marel co-developed with Tomra an inspection system to detect soft foreign material. Such soft contaminants can pose possible risks to consumer health and cause significant damage both to the brand and the company. By minimizing these risks, Marel's revolutionary Spectra imaging solution will give peace of mind. Hyperspectral imaging allows Spectra to perform a near 360° surface scan of poultry products. Despite its small footprint, Spectra excellently manages to detect plastic, rubber, wood and other types of soft contaminants. With a very low false-positive rate and minimizing rework, it is easy to incorporate Spectra into a production line.

Controlled Forming and Coating

Convenience food is more sought after than ever before. Food processors are challenged to offer greater flexibility to produce higher volumes of more diverse convenience food. This global demand stimulated Marel to develop its new high-throughput 1000mm Coating Line.

The new 1000mm Active Flour Applicator, Active Batter Applicator, Active Tempura Applicator, RevoCrumb and RevoBreader feature wider belts and more robust, fail-safe designs. These systems lay the perfect foundation for a good-looking end product, thanks to an unrivaled even coverage of both the top and the bottom of the products. The high-quality coating abilities of Marel's modular coating line are unequaled in the market, be it homestyle, tempura, coarse or breadcrumb.

When combined with Marel Convenience Line Software, the Coating Line gives even more control over the coating process, to reduce off-spec products. The data-driven process depends less on operators and gives full insight into production.

Breaded strips

The new 1000mm Coating Line is the final link completing Marel's full 1000mm Convenience Line. It connects perfectly with RevoPortioner 1000 and existing 1000mm fryers and ovens. Marel always has a state-of-the-art solution available for the production of burgers, schnitzels, chicken wings, nuggets, strips or popcorn.

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