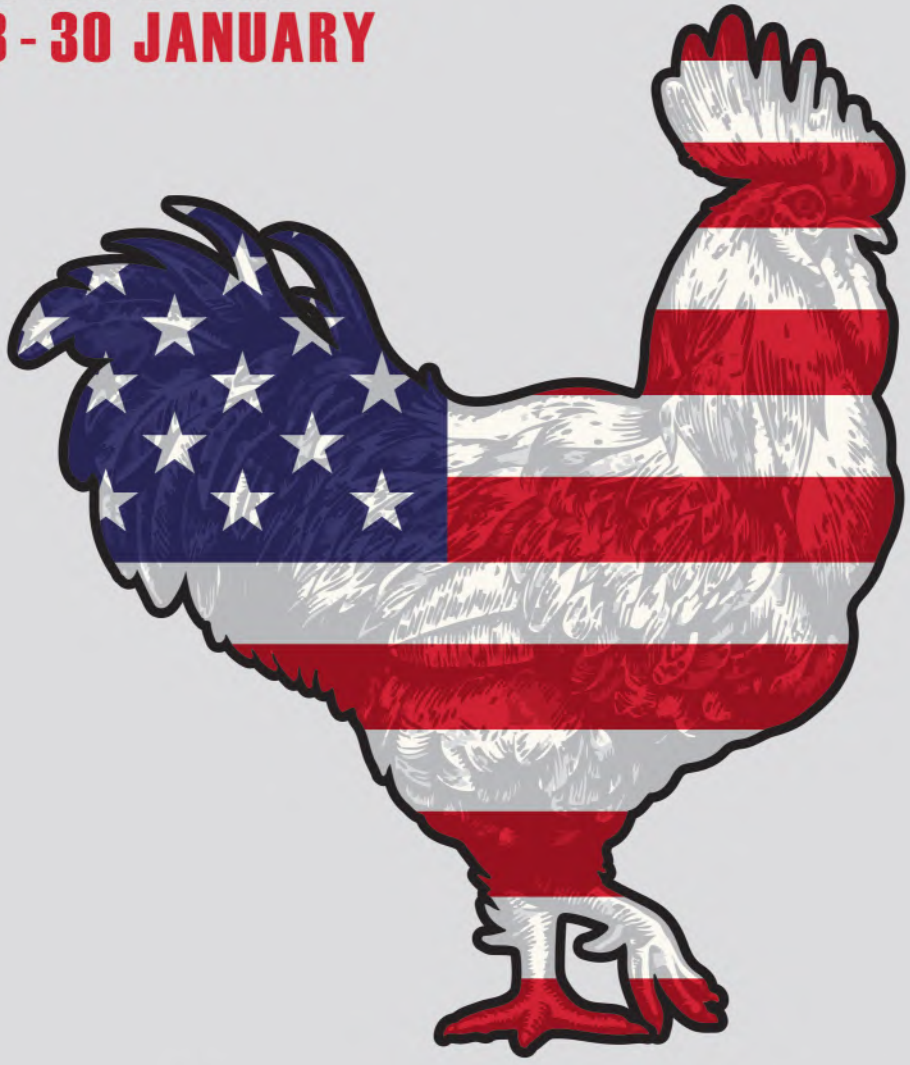
INTERNATIONAL 29 / 2019

MEATING POINT magazine

SUSTAINABLE TECHNOLOGY, PROCESSING & PACKAGING

THE WORLD'S LARGEST TRADE SHOW FOR POULTRY, MEAT AND FEED INDUSTRY OPENS ITS DOORS ON 28 - 30 JANUARY



THE DIGITALIZATION OF FAST FOOD

PACKAGING CONCEPTS AND METHODS FOR PRESERVING MEAT QUALITY

EXPLORING TECHNOLOGY IN THE FOOD INDUSTRY

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Dear reader,

Jenny Smart

As you may know, the integrated model of poultry production has its origins in the US and is most developed there. Modern broiler production as it exists today is generally thought to have begun in Delaware. It's not a surprise that American's eat 42kg of chicken per capita a year – the highest in the world – and during the Superbowl (which is usually within a week of the IPPE) they consume more than 1.3 billion chicken wings. America's poultry industry is the world's largest, as the country produces a staggering nine billion birds a year, about 17% of which are exported, predominantly to Mexico, Angola, Taiwan, Cuba, and Canada. By 2023, in fact, the Organization for Economic Cooperation and Development predicts chicken will overtake pork as the world's most consumed meat.

What a better opportunity to learn more about the industry than the upcoming IPPE - the world's largest annual poultry, meat and feed industry of its kind? The 2020 International Production & Processing Expo to be held in Atlanta, Ga.USA on 28-30 January will bring together more than 1,300 exhibitors and 32,000 visitors.

A wide cross-section of visitors from the United States, South America, Europe, and Asia makes the IPPE a great place to visit and make new acquaintances in the poultry sector. Running parallel with the show is a comprehensive range of seminars and workshops for attendees. Some are free, including a market intelligence update. Others range from seminars on connecting with consumers about meat production to managing a modern farming family business. All the major global suppliers to the poultry sector are present at the IPPE. From genetics giants and feed specialists to processing experts. Find some of the innovations to be showcased on pages 18 - 28.

As always, you will find some of the latest business and industry news, research papers and technological innovations, and some of the upcoming " Meating" points.

Lastly, with this final issue of 2019, I would like to say a big thank you to all our readers, advertisers and contributors. Wishing you all a Merry Christmas and a Happy New Year!

Enjoy your read!

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MULTIVAC COOPERATES WITH LEADING MANUFACTURER OF PIEZO INKJET SOLUTIONS

With immediate effect MULTIVAC has the exclusive rights to market the InteliJet HD series of printing solutions from the US manufacturer BELL-MARK Sales Co. The inkjet printers are based on the piezo technology, and their main features include a large print area and excellent print quality on a wide range of materials. They can either be integrated into new packaging lines or retrofitted to existing ones.

"BELL-MARK is a leading manufacturer of digital printing systems for packaging machines, and the company has established itself as a relia-ble partner with many of our customers," says Luc van de Vel, Vice Pres-ident of the MCP (Medical, Cosmetics and Pharmaceuticals) Business Unit, explaining the reasons behind this strategic step. "Thanks to this cooperation, we can now offer high-performance digital printers for challenging requirements within the packaging process, particularly in the sectors of medical products, pharmaceuticals and cosmetics."

The InteliJet HD series of printers are drop-on-demand digital printers, which can be configured for either one or two colours or even the full CMYK colour scale. In contrast to CIJ (Continuous Ink Jet) printers, which produce a continuous jet of ink, the nozzles of DoD printers only supply the ink drops that are actually required for the print. This is very efficient and therefore particularly cost-effective.

Thanks to its print resolution of up to 600 x 600 dpi and a printing speed of up to 150 metres per minute, the technology enables texts, logos, variable data and various codes to be printed precisely and cost-effectively on a wide range of materials such as paper, Tyvek®, film or aluminium. The high-quality UV inks dry very quickly with state-of-the-art UV LED lights, and the ink spread remains very small even with the coarse-fibred Tyvek® material, so that even small icons and text can be reproduced perfectly. The InteliJet HD printers are designed for a large print area and can print films either completely or partially with a high level of accuracy. The modules can be fitted with up to twelve printing heads, so that a complete blank film with a width of up to 630 millime-tres can be printed.

Companies in the medical and pharmaceutical industries in particular benefit from the printing system's high degree of flexibility, which is be-coming

increasingly important in view of the requirements of the UDI Regulations as well as serialisation.

All BELL-MARK models can be integrated into MULTIVAC packaging lines. Customers also have the opportunity of having their existing lines retrofitted with the printing system by MULTIVAC.

The printers and the corresponding consumable materials will be mar-keted by the more than 80 subsidiaries within the MULTIVAC Group. MULTIVAC is the exclusive sales partner of BELL-MARK for all regions worldwide - with the exception of the USA, Canada, Mexico, Puerto Rico and the Dominican Republic. The specialists at MULTIVAC Marking & In-spection will undertake the complete after-sales service as well as the supply of spare parts, consumables and user training. Thanks to their many years of experience in printing with a wide range of technologies, they can ensure that the maximum reliability and durability of all installed solutions is achieved.

www.multivac.com

HYDROSOL SETS UP COMPETENCE CENTRE FOR PLANT-BASED PRODUCTS

Plant-based alternatives to meat, sausage and dairy products have gone mainstream. Vegan products are getting more and more retail shelf space, and are the basis for new concepts in the out of home market. According to Innova Market Insights, in the last few years products marked "plant-based" and "100 percent plant-based" have experienced annual growth of 60 percent. Market researchers prognosticate continued growth going forward, among other things through new ideas in the trend category of snacking.

The reason for the steadily rising demand for vegan products is a cultural shift in eating habits, according to Innova Market Insights, as consumers are much more careful about what they buy. They are paying more attention not only to their own health, but also to issues like sustainability, animal welfare and climate change. Hydrosol saw the potential of plant-based foods early on, and in 2014 the company marketed the first functional systems for making plant-based alternatives to cheese and sausage. Since then its portfolio of innovative product ideas has grown enormously, and today Hydrosol is an established international expert for plant-based alternatives. With the formation of the Plant-based Competence Centre the company has now bundled all of its expertise in a creative pool. Here, product managers, nutritionists, food technologists and marketing specialists develop creative concepts to address the trends in international markets. "In our stabilising and texturing system concepts we have long combined market trend knowledge with scientific and technological understanding. Our new Plant-based Competence Center is a seedbed for innovative food concepts with high future potential, as well as a dialogue platform for our customers," notes Hydrosol Managing Director Dr Matthias Moser.

Protein Knowledge for Market Success

New protein sources play a key role in the development of plant-based alternatives. The success of a plant-based product depends to a large degree on how close it comes to meat products in taste and texture. Here, tradition, experience and habit remain the determining factors. Consumers will accept alternative products only if they possess the accustomed characteristics of the meat products they replace. In other words, plant-based yes, as long as it looks and tastes like animal-based. This is not anticipated to change substantially in the foreseeable future.

The choice of plant proteins is very important in meeting the expectations of consumers, as Dr Dorotea Pein, Director of Product Management at Hydrosol, explains: "A detailed knowledge of the available protein sources is essential. Not only are more and more vegan foods available, there is a wider range of plant proteins to choose from. In addition to soy there is now also a multitude of other options, from familiar sources like peas, rice and coconut to newcomers like sunflowers and rapeseed. But not every protein is suited to every application."

When characterising a new protein, Hydrosol first tests its sensory and rheological properties. Other criteria are the microbiological count, allergenic potential, compliance with hygienic standards and certified processes, as well as price and availability. If the protein meets all these criteria, it goes into testing. "We've done hundreds of application tests and have built up a solid and growing database on the characteristics of different proteins. This wealth of experience is the foundation of our new Plant-based Competence Center," says Dr Pein. "There, we advise customers on the ideal choice of proteins, and also on trends, flavouring and nutritional enrichment. We work closely with our sister companies, in order to supply stabilisation and texturing while also addressing other aspects like the ideal micronutrient profile and trending flavour combinations. Our goal is not just to give our customers ideas for plant-based alternative products, but to deliver concepts with added value." This is important in view of the growing world population, as the future supply of safe, affordable, appetising foods is one of if not the central challenge of our time.

www.hydrosol.de

HIPERBARIC RECEIVES 2019 EUROPEAN TECHNOLOGY AWARD RECOGNIZING COMPANY'S HIGH PRESSURE TECHNOLOGY INNOVATION

Hiperbaric received The European Technology Award Dec. 6 at the Ritz Hotel in Paris.

The organization rewards the work of professionals, companies and institutions in the European technology sector. The European Technology Awards create a space for exchange and knowledge, bringing together leading professionals, companies and institutions. As a technology-based and benchmark company in its sector, Hiperbaric was awarded in the Technological Innovation category.

"We are honored to receive this award, which recognizes leading European professionals and companies that have made innovations in their industries," said Andres Hernando, Hiperbaric CEO. "Hiperbaric has a 20-year history of innovation and we continue to make R&D a major focus of our company."

Hiperbaric invests more than 10% of its net profit in R&D and more than 20% of its staff is directly or indirectly involved in R&D projects.

Hiperbaric recently celebrated its 20th anniversary at which it announced the expansion of its facility in Burgos, Spain, and its latest innovation, Hot Isostatic Pressing (HIP) for post-processing metal parts with additive manufacturing.

The company began its journey in the field of high pressure in 1999 with the development of its first HPP (High Pressure Processing) equipment, a technology that employs high isostatic pressure (up to 6000 bar) to extend the shelf life of food and guarantee food safety. Hiperbaric is the world leader in this technology, thanks to its commitment to R&D and its more than 20 innovation projects.

About the European Technology Awards

The European Technology Awards, created by the Professional and Business Excellence Institute, rewards professional excellence and the good work of companies and entities from varied sectors. European Award winners are those whose professional career is an example of overcoming and success, based on their effort, determination and creativity. Their mission is to recognize the work of entrepreneurs, scientists, artists, and athletes for their contribution to the professional world that makes us look to the future with hope.

www.hiperbaric.com

STEEL BELT CONVEYORS FOR HYGIENIC MEAT PROCESSING

Upgrade to an IPCO steel belt meat conveyor for easy sanitizing, reduced cleaning costs and 'best practice' hygiene.

As a world leader in the supply of bacteria-resistant stainless steel conveyor belts for the food industry, we can help to ensure that you maintain the highest standards of hygiene and at the same time reduce your cleaning costs. Ask us for a copy of the VTT Expert Services report confirming the superior cleanability of steel belts, and for details of how our Application Team can support your upgrade process.

ipco.com/hygiene

ipco

ADM FINALIST AT FI INNOVATION AWARDS IN THE SUSTAINABILITY CATEGORY

Archer Daniels Midland Company (NYSE: ADM) was named a finalist in the Sustainability Champion category at the Food Ingredients Innovation awards on December 3, 2019 in Paris, France. ADM was shortlisted for its efforts in promoting sustainable agricultural practices among more than 12,000 smallholder farmers to support biodiversity conservation in three regions of Brazil and Paraguay.

In collaboration with local NGOs, the project generated significant social impact by connecting directly with farmers and their communities to disseminate techniques that not only benefit the environment, but also the people that form part of ADM's supply chain. With the training drawing upon traditional agricultural knowledge and modern biodiversity initiatives, thousands of farmers developed the know-how to improve sustainability management, climate change resistance and overall crop yields. Guidelines were also developed for producers and agriculture schools outlining best practices, and tools were identified to preserve native forests on farmland. Additional sustainability initiatives were launched through hundreds of community-based micro-projects.

"We have an important responsibility in preserving the natural resources that we depend on, and in supporting local communities that we work with to build capacities in sustainably managing their farmland and preserving biodiversity," said Ana Yaluff, Sustainability manager - Europe, ADM. "We are committed to achieving our environmental obligations, but beyond that we continually strive to enhance our efforts in developing sustainable supply chains by working with local communities and organizations," continued Yaluff.

www.adm.com

INTELLIGENT VACUUM PUMP SERIES FOR ROBUST PROCESSES

With the claw pumps of the DZS 100 - 400 VSD+ series, Atlas Copco is launching a new air-cooled, oil-free claw pump for particularly harsh applications.

The robust pump increases productivity in conveying, clamping, drying processes or environmental applications thanks to its low energy consumption and space requirement as well as its handling of pollutants. Using the newly developed VSD+ App, users can now set and access the relevant parameters of the vacuum pump quickly and in real time via iOS or Android devices.

For Robust Processes

Atlas Copco has equipped the three models of the DZS 100, 200 and 400 VSD+ series with

Atlas Copco has equipped the three models of the DZS 100, 200 and 400 VSD+ series with corrosion-resistant materials in order to be well equipped for harsh application environments. (Photos: Atlas Copco).

With the claw pumps of the DZS 100 - 400 VSD+ series, Atlas Copco is launching a new air-cooled, oil-free claw pump for particularly harsh applications. (Photos: Atlas Copco).

corrosion-resistant materials in order to be well equipped for harsh application environments. For this purpose, they also have a durable internal coating. "This means we have designed the vacuum pump specifically for a long service life and reliable, efficient operation, even under robust process conditions," explains Alexander Frerichs, Product Manager for Atlas Copco's Dry Vacuum Pumps.

Low Service Effort

In addition, the design principle requires uncomplicated maintenance: "For example, cleaning or replacing the pump claws does not require complex gearbox stripping and retiming," explains Alexander Frerichs. This allows quick access to the inside of the pump by our service technicians or by the end customer. This simplifies, for example, the removal of product residues. No new synchronisation is necessary during the subsequent assembly. This results in short downtimes and low service costs for the operator.

No Oil-induced Contamination

A VSD+ inverter drive is integrated in the motors to control the pumps. This allows the optimum performance points of the claw pump to be specifically controlled and power consumption to be reduced. This function ensures that energy is saved, and the CO2 footprint is reduced. Sustainability is also ensured in the immediate process environment: the completely oil-free DZS VSD+ pumps certified to ISO 8573-1 Class 0 and are completely harmless to the quality of the ambient air during operation. This eliminates the risk of oil-induced contamination and damage to sensitive applications and products in the environment. "This also includes the guarantee that neither man nor the environment will be harmed by the use of the pumps", emphasises Product Manager Alexander Frerichs.

Commissioning Via App

With the newly developed VSD+ App, users have quick access to numerous parameters. Via the iOS and Android devices, values such as inlet pressure, rotor speed, running hours and service intervals can be monitored and controlled at a glance in real time. The VSD+ App also makes it easy to commission the DZS VSD+ vacuum pump - via the three parameters target pressure, start/stop delay and stop level. When the pump is started, the VSD+ App automatically connects via Bluetooth. Once the desired values have been entered, the innovative DZS 100 - 400 VSD+ series starts operation immediately.

The Advantages of the DZS 100 - 400 VSD+

Series at a Glance:

- Longer life bearings and seals
- Quick and straightforward access
- Easy cleaning
- Reduced maintenance time

Superior Performance

- Extensive product range
- Superior ultimate vacuum level
- Lower power consumption
- Minimal machine life cycle costs
- Low noise level.

www.atlascopco.com

SOPHISTICATED AND DELICIOUS - MOGUNTIA FOOD GROUP CREATES AN APPETITE FOR MEAT FREE DISHES

Vegetarian and vegan products are not a temporary fad anymore, but have become socially acceptable. Not only German consumers are increasingly looking for plant based meat substitute products - whether for ethical-moral, religious or health reasons. Not only "real" vegetarians and vegans are among the main buyers of meat substitutes, but so-called flexitarians, i.e. people who have a partially meatless diet. The increasing environmental awareness, especially of young consumers, favours a temporary or complete renunciation of meat.

Customers who want to restrict their meat consumption, but nevertheless do not want to miss out on the pleasure of eating meat, will find a variety of vegetarian and vegan alternatives in the MOGUNTIA FOOD GROUP program.

Veggie-Burger - Meat Free Pleasure Without Compromise

It's not as easy as one would think to produce a meat free burger, especially if the target group are so-called flexitarians. The expectations for a particular feeling in the mouth and a taste that is similar to that of a minced meat product are high. The biggest challenge is the necessary protein content that manifests itself in the roasting aromas when frying but also in the protein coagulation during the bite as well as in the protein decomposition substance glutamic acid (the umami). Protein rich pulses such as soy or the wheat protein that is known as saitan are best suited for the production of burger patties.

The MOGUNTIA FOOD GROUP offers special mixtures for the manufacture of both of these patties, for example FITESSA® Wheat-Mix and FITESSA® Vital-Mix. Depending on customers" wishes, additional vegetable components can be incorporated.

"Take fresh mushrooms as the vegetable component. They have a high protein content, strengthen the meat-like umami and give the burger a special character", recommends Jens Trautmann, consultant and product manager at the MOGUNTIA FOOD GROUP.

"The only thing that counts is taste", says Jens Trautmann and adds "because if you want to do without meat, our range of meat alternatives means that you don"t need to give up the taste you are used to and corresponding texture"

www.moguntia.com

CORBION: ACHIEVING GREAT TASTE AND QUALITY (NATURALLY)

Using the power of nature to improve both taste and quality was the focus at Fi Europe 2019 for Corbion, the leading supplier of biobased food ingredients. Launching no less than six new ingredients within its Verdad® and PuraQ Arome® portfolios, the company now has an unrivalled range of solutions that enhance food safety, stability and flavor profiles across sectors including meat and seafood, bakery, and ready-to-eat meals, sauces and dressings. All are natural alternatives to ingredients like sorbates and benzoates, allowing manufacturers to create more naturally the stable, safe and flavorful products that consumers demand.

"Demand for natural ingredient solutions is only growing stronger," says Marco Beltrao, Business Development Director EMEA, Corbion. "As a pioneer in biobased ingredients, we're constantly developing and improving products and expertise that help manufacturers to develop the success stories of tomorrow, with ingredients that deliver – without compromise – on safety, functionality and taste."

Ensuring Safety in Meat and Seafood

With safety top of the agenda for the entire food industry, two of Corbion's new ingredients have been developed based on the company's

extensive expertise in preservation and Listeria monocytogenes growth control. Both are not only natural alternatives to traditional additives; they also extend shelf life, while enhancing color retention and maximizing flavor.

For fresh meat suppliers looking to offer simpler, more recognizable labels and shelf appeal, Verdad Avanta F250 is a naturally-derived preservative solution that reduces discoloration over time and guarantees a good sensory experience. A dry vinegar-based solution optimized for use during the curing process, Verdad Opti. Powder N350 is the first ingredient of its kind on the market for dry-cured smoked salmon producers to control listeria growth.

Longer - lasting Sauces, Dressings and Ready-to-eat Meals

Set to rise in value by around US$ 750 million (€677 million) in Europe over the coming five to six years[1], demand has never been higher for sauces and dressings, while the ready-to-eat food market is poised to grow at a CAGR of 4.3% by 2024[2]. Here, for taste improvement as well as prolonged shelf life, Corbion is introducing Verdad N335, a powerful yet natural antimicrobial ingredient for sauces and chilled dressings. Verdad N330, on the other hand is specifically formulated to target lactic acid bacteria in low pH applications (3.5 – 3.8).

For optimized flavor with natural ingredients in sauces and both packaged and freshly prepared salad dressings, Corbion's new PuraQ Arome 110 improves organoleptic qualities by balancing sour notes, while also enhancing spiciness and other flavor profiles.

www.corbion.com/food

[1] *Global Sauces, Dressings, and Condiments Industry, Global Industry Analysts, October 2019: (https://www.reportlinker.com/p05817812/Global-Sauces-Dressings-and-Condiments-Industry.html)*

[2] *Ready to Eat Food Market – Growth, Trends, and Forecasts (2019-2024), Mordor Intelligence 2018: (https://www.mordorintelligence.com/industry-reports/ready-to-eat-food-market)*

PRODUCTION SAFETY WITH THE VF 800 VACUUM FILLER

TÜV-certified VF 800

The Handtmann VF 800 vacuum filler provides production safety in many respects thanks to state-of-the-art technology coupled with digital solutions. From supervised production through a digital monitoring function and integrated metal detectable components to operator safety through intelligent technical modules.

Automatically Monitored Product Quality:

The VF 800 monitors the conditions in the feed system on the basis of pressure, temperature, vacuum and drive load, and reports potential causes of quality deterioration in good time via the control system and the optionally available signal light. This monitoring function (HMF) thus effectively ensures quality standards in production.

Food Safety is Also Guaranteed:

In the VF 800, all the non-metallic parts in food contact areas are metal detectable and FDA-compliant and can also be easily identified visually thanks to their blue colour. The scraper in the hopper is designed to ensure that it cannot be lost or break and all lubricants are suitable for food use according to USDA H1 approval.

Safety Through Optimal Cleaning

Pure hygienic design in accordance with DIN EN 1672-2:2005, with smooth and easy to clean external machine surfaces, small gap widths, short seal lengths and few edges, ensures perfect hygiene. The VF 800 vacuum filling machines are equipped with a cleaning programme for the feed system as standard. This facilitates effective pre-cleaning with warm water up to 90 °C. Optional, patented, automatic pre and interim cleaning of the hopper via a spray head provides additional benefits. In a programme-controlled process, this sprays every single point in the hopper with water, thus reducing the time needed for interim cleaning in the event of a product change or for final cleaning. The patented UVC ambient air degermination with a degermination unit reliably and effectively kills airborne germs, such as listeria as well as spores from ageing chambers by UVC radiation. Furthermore, the cleaning quality is excellent due to the optimal shape, low penetration depth and the larger diameter of the water separator. The water separator lighting also facilitates checking the cleaning results. In addition, the vacuum slide is permanently attached, thus the vacuum seal can be removed and the vacuum channel can be cleaned from the outside without the hopper having to be opened. When the swivel-type hopper housing is opened, the vacuum channel and the vacuum pipe are fully visible and the channels are even lit. Food safety is further increased by an anti-drip moulding affixed to the cage that minimises the contamination risk from water dripping from the underside of the sausage meat trolley.

Hopper cleaning and break-proof scraper

The New Step Ensures Safety of the Operating Staff.

The step's safety switch is only triggered when the operator climbs onto the step. Therefore it can stay folded down while the machine is running. The permanent manual folding up and down of the step and the associated risk of contamination are eliminated.

www.handtmann.de

VF 800 with anti-drip moulding

SUSTAINABLE, WHEAT-BASED SOLUTIONS ADDRESS GROWING DEMAND FOR PLANT-BASED PROTEINS

At this year's FiE, Loryma, global supplier of advanced wheat raw materials, showcased solutions to meet the world's growing demand for high quality, protein-rich food. The company offers a range of options for products such as vegan meat alternatives, enhanced bakery goods and a broad spectrum of processed foods. Lory® Tex, Lory® Bake and Lory® Starch are speciality ingredients that promise ease of processing while optimizing nutritional value of the finished product. Visitors to the booth could try indulgent samples: vegan bacon and a "Homestyle" burger, low carb but high protein blueberry muffins alongside savoury and sweet high protein bites all demonstrated delicious application possibilities.

With a growing world population, demand for protein – an essential component of a healthy diet - is continually rising. However, a combination of ecological and ethical concerns means consumers are increasingly seeking vegan sources. To improve the texture and taste, along

with the nutritional value of vegetarian and vegan alternatives, and much more besides, Lory® Tex textured wheat proteins are the obvious choice. Neutral in both odour and flavour, plant-based protein enrichment with Lory® Tex is also highly flexible: several forms and colours are available for use in a variety of food concepts. As part of the company's functional blends portfolio, Lory® Bake Cereal Binder and Lory® Bake Muffin HP allow the creation of snacks that are high in protein and fibre, yet low in sugar.

To round up the base portfolio, Loryma also presented its Lory® Starch native and modified wheat starches for the enhancement of bakery, confectionery and convenience products. Likewise, the company's range of functional blends enables improved coatings, breadings, stability

and texture of numerous finished products.

Henrik Hetzer, Managing Director at Loryma, explains: "The response at FiE clearly demonstrated that forward-looking concepts that comprise advantages in processing while also addressing current consumer demand are urgently needed. Therefore, our most important guiding principle is to develop high-quality raw materials that support industry and, additionally, offer optimized dietary impact while being sustainably produced."

www.loryma.de

MAREL COATING EQUIPMENT TRANSFORMS CONVENIENCE PRODUCTION

Consumer demand for value-added convenience products is on the rise. Consumers want more variation in flavors and appearance of the end-products they purchase. To meet this demand, producers of convenience products need to be able to produce a limited number of high volume products, as well as a wide variety of small volume products. Marel's coating portfolio combines high production capacity with the flexibility to produce a variation of end-products, without compromising product quality.

New Coating Equipment

Presentation plays a key factor in the consumer's choice for a product, so it is of vital importance to get your coating right when producing convenience products. Coating influences yield and will largely determine the appearance and bite of an end-product. The options for possible coatings are numerous and can be pre-dust, wet or dry coating, or rather a combination of these steps. The optimal coating process depends on the desired end-product. Marel can supply the appropriate system all coating steps, to make every conceivable coated end-product.

Home-style Coating

To get a typical home-style coating, Marel's RevoBreader is the perfect match. This machine creates top quality home-style products and offers maximum flexibility to processors. The large drum size of the machine gives a high mechanical impact on the products, which results in a high pickup of crumb and a flawless product appearance.

The RevoBreader is a dual mode machine that offers a flatbed and a drum mode in one enclosure. Thanks to the large drum size, changing the configuration of the RevoBreader is a one-person job that can be done in less than ten seconds, without using any tools. This makes change-over times extremely short, and gives producers even more flexibility in their production process.

Full Convenience Line

Marel's RevoBreader can be an integral part of a complete convenience line, combining it with RevoPortioner, Active Batter Applicator, Active Mixer, Active Tempura Applicator, GoldFryer and ModularOven. Together, these machines can create a wide variety of tasty added value products. A major asset of this line is its high flexibility. It is easy to have a particular set up for e.g. home-style chicken wings (with RevoBreader's drum option) and change the configuration, giving the RevoBreader another role, to produce e.g. homogeneously coated schnitzels.

Production Insight

For a centralized process control solution, Marel's convenience equipment can be fitted with Innova Food Processing Software. With Innova, processors can control and monitor their process and develop insight into the production line's effectiveness. Innova provides real-time data for performance monitoring and enables processors to maximize their yield and throughput, while complying with quality and traceability standards to ensure food safety.

www.marel.com

STAINLESS STEEL CONVEYING FOR ENHANCED HYGIENE

Staffan Karlsson, Global Marketing Manager for Belts at engineering company IPCO, looks at the benefits of using steel belts in meat processing operations.

Stainless steel conveyor belts can be produced in solid or perforated form and to virtually any length or width. They are strong, stable and extremely durable, and – with a flat, smooth surface – fast and easy to clean too. And being chemically and bacterially neutral, stainless steel poses no threat to either human health or to the taste of food.

These qualities make steel belts suitable for everything from simple conveying to the processing of fish, meat, poultry, fruit, vegetables, coffee, tea, confectionery, baked goods, pet foods and more.

For applications such as freezing, cooling, cooking and steaming, the thermal properties of the steel belt – the ability to operate in extreme temperatures and to conduct heat quickly and efficiently – is a major benefit, as are durability and corrosion resistance.

However, the core benefit of stainless steel as far the meat industry is concerned – and the reason it is the material of choice in every stage of processing – is its inherently hygienic nature.

One of the most significant threats to a sanitary processing environment is the risk of biofilm formation on work surfaces; unless cleaning is complete and effective, this can lead to the growth of harmful bacteria and pathogens.

The structure of a stainless steel belt is a key advantage in this respect. With no gaps, textures or hidden areas in which microbes could hide, cleaning and sanitizing can be completed quickly and more efficiently than with other belt materials.

Scientists at Finnish food laboratory VTT Expert Services Ltd confirmed this when they found that that upgrading to a stainless steel conveyor reduced the risk of bacterial build-up.

The research looked at the 'cleanability' of three types of conveyor belt: stainless steel (AISI 301), solid plastic, and a plastic conveyor of slat construction. All three were tested in pristine condition and also with knife damage to replicate everyday wear.

The conclusion was that: "stainless steel is more cleanable than the two different plastic surfaces tested according to the culturing results. The difference is more significant for damaged surfaces."

Rapid Cleaning for Long-Term Cost Savings

This superior cleanability also offers commercial benefits. The fact that stainless steel conveyor belts can be cleaned and sanitized significantly faster than other materials ensures high availability, important in multi-shift operations. Short cleaning times also represent best practice in ecological and economical terms, with low water consumption and low use of detergents and other cleaning chemicals.

From a purely financial viewpoint, the combination of long-term payback and reduced cleaning costs makes it an attractive return on investment. Factor in the improved hygiene and it's not difficult to see why more and more meat processing operations are choosing solid steel belt conveyors.

Service and Process Expertise

IPCO's global service engineers have extensive experience of working with machine builders and end users to achieve optimum performance, and this process expertise is readily available.

As well as supplying steel belts, the company can offer a comprehensive range of ancillary equipment including belt tracking systems, graphite skid bars that optimize performance, end drums, sheaves, shafts, bearings and breakpoints.

All this puts IPCO in a unique position to support equipment manufacturers and end users with engineering and technical support in the design, maintenance and service of conveyor systems.

www.ipco.com

WORLD'S LARGEST TRADE SHOW FOR POULTRY, MEAT AND FEED INDUSTRY OPENS ITS DOORS ON 28 -30 JANUARY

The 2020 IPPE will be held Jan. 28-30 and is a collaboration of three trade shows – the International FeedExpo, International Poultry Expo and International Meat Expo – representing the entire chain of protein production and processing. The event is sponsored by USPOULTRY, the American Feed Industry Association and the North American Meat Institute.

The 2020 International Production & Processing Expo will bring together more than 1,300 exhibitors and 32,000 visitors in Atlanta, Ga. USA. IPPE is the world's largest annual poultry, meat and feed industry event of its kind. A wide range of international decision-makers attend this annual event to network and become informed on the latest technological developments and issues facing the industry. This special event has a great global reach and attracts meat and poultry processing companies from more than 129 countries, providing excellent networking opportunities, and educational programmes on topics that cross industry interests.

Poultry Market Intelligence Forum to Examine Industry Market Trends and Challenges for 2020

U.S. Poultry & Egg Association (USPOULTRY) will host its annual Poultry Market Intelligence Forum at the 2020 International Production & Processing Expo (IPPE) inAtlanta. The event provides insight into the current markets for chicken, turkey and egg products around the globe and factors that may affect these markets in 2020. This year's forum will be held from 9 a.m. to12 p.m. on Wednesday, Jan. 29, 2020, and is free for all registered IPPE attendees.

A leading industry economist will provide insights on the domestic and global markets for poultry and egg products, and other industry experts will address how the industry is continually improving its performance and managing regulatory issues impacting the poultry and egg industries. They will identify challenges facing the industry and discuss how the U.S. and international poultry and egg industries are positioned to move forward in 2020.

International Rendering Symposium to Examine Industry at 2020 IPPE

Every year, renderers safely convert more than 50 billion pounds of inedible animal products such as fat,bone and used cooking oil into everyday products, making rendering a highly sustainable practice and a key player in the reduction of food waste. The successes of this industry and the challenges facing it will be discussed at the 2020 International Rendering Symposium. Hosted by the North American Renderers Association (NARA) and U.S. Poultry & Egg Association (USPOULTRY), the International Rendering

Symposium will focus on challenges and opportunities facing the rendering industry today and in the near future, as renderers play a critical role in the sustainability of the agricultural industry. The two half-day symposium will begin on Thursday afternoon,Jan. 30, 2020 and continue through Friday morning, Jan. 31. The cost of registration is $200.

2020 Animal Agriculture Sustainability Summit to Feature Advancements in Industry Sustainability Programs

An ever-increasing population coupled with a changing agricultural workforce has compelled the animal agriculture industry to make sustainability its top priority. In a reflection of the important role sustainability holds in the industry, the annual Animal Agriculture Sustainability Summit will once again be held at the 2020 International Production & Processing Expo (IPPE) in Atlanta. The Animal Agriculture Sustainability Summit is scheduled from 9 a.m. to 12 p.m. on Tuesday, Jan. 28, 2020, and is offered free of charge to all registered IPPE attendees.

The Animal Agriculture Sustainability Summit program will focus on current sustainability topics relevant to the animal agriculture industry. Representatives from the beef, dairy, pork and poultry industries will share details on the development of industry programs and tools to further each industry's efforts to produce more protein in a more sustainable way. There will also be an update on the newly formed Poultry & Egg Sustainability and Welfare Foundation and the U.S. Roundtable for Sustainable Poultry & Eggs. The program will conclude with a ceremony announcing the winners of USPOULTRY's Family Farm Environmental Excellence Awards for 2020.

www.ippexpo.org

BATCH PORTIONING WITH SIGNIFICANT LESS GIVE-AWAY

Cabinplant A/S, the innovative and global supplier of tailor-made processing and weighing/packing solutions, presents value-creating batch portioning and multihead weighing systems for the meat and poultry processing industry at IPPE 2020.

The Cabinplant Multibatcher is ideal for weighing large portions of meat and poultry to reduce give-away and labor costs. With its highly automated process for portioning up to 75 lbs batches, the solution has the potential to send the meat processing industry into the fast lane. Especially at a time, when challenges such as African swine fever can open up for new business opportunities and markets.

The Cabinplant Multihead Weigher solution with the unique screw feed technology eliminates problems with poultry meat that sticks during the weighing and packaging process. Among the other unique features of the system is the sensor gate technology that addresses the issue of making few-piece portioning with a high degree of precision when it comes to fixed weight output.

Highlights at IPPE 2020:

• Multibatcher – innovative food weighing technology that increases throughput, reduces give-away and labor costs significantly when it comes to weighing and batching of large portions

• Multihead Weigher with unique screw-feeder technology for weighing of sticky poultry meat without unnecessary downtime in the production line – including sensor gate technology for accurate weighing of few-piece portions

Cabinplant Multibatcher: Box Packing in the Fast Lane

The Multibatcher is an automatic high-speed solution for weighing and packing of large portions up to 75 lbs.

The Multibatcher is an automatic high-speed solution for weighing and packing of large portions of up to 75 lbs. It is the first batcher based on combinatorial weighing and an alternative to conventional batching and manual processes. The Multibatcher has the potential to significantly reduce give-away and costs through precision and speed.

The combinatorial weighing principle is a unique feature. The raw materials are weighed into partial portions in a number of pans from which they are combined and selected to create the needed batch weight. This weighing principle is also known from Cabinplant's successful Multihead weigher and results in a higher accuracy.

Tests of the Multibatcher show an average give-away down to 0.25-0.7%, depending on the size of the portions. This is a very high accuracy compared to other solutions on the market like batching based on the top-up principle. - The Multibatcher means significant savings. The give-away can be reduced with up to 2000 lbs of meat on a daily basis for a processing line running two shifts and based on 3.5 oz or less give-away per portion, says Johnnie Erichsen, Senior Vice President and CCO, Americas at Cabinplant.

The Multibatcher processes up to 12 batches per minute in batches of 1-75 lbs. The solution is tailor-made and can be fitted into existing packing lines or used as a stand-alone unit. The Cabinplant Multibatcher is suitable for all kinds of small or large products, including meat, meat by-products, poultry and fish products and comes in two versions with a pan volume of 5 or 8 gallons.

Cabinplant Multihead Weigher: Nothing Sticks and Stops

Nothing sticks and stops with Cabinplant's Multihead Weigher - thanks the unique screw feeding principle.

The presentation of the Multihead Weigher solution at IPPE follows a noticeable progress for the solution in the US market. A leading US company within packaged meat recently installed the Cabinplant Multihead Weigher solution in their pork processing units. In the world-wide poultry industry,

Cabinplant has delivered several hundred weighing installations for fresh products alone, thanks the unique screw feeding principle.

According to one of Cabinplants largest customers in the poultry business the success of the Multihead Weigher is no coincidence:

"They were showing the Multihead Weigher and screw feed technology and it appealed to me because it could automate the weighing process and the packing of poultry parts in trays, that could not be handled by our regular weighers with vibration shutes."

"It worked! Manual handling has been eliminated, and the poultry parts are weighed precisely and packed in trays. All the meat passes through without becoming stuck to the equipment," says the production director of the leading poultry company.

The traditional vibrating method makes it very difficult to ensure precise and fast weighing as fresh chicken fillets tend to stick. The patented screw feeding principle allows the portions of poultry to be weighed precisely, using a multihead weigher, reducing costly downtime.

Sensor Gate Technology: Precise Few-Piece Portions

The sensor gate technology developed for the Cabinplant screw feed Multihead Weigher enables a precise weighing of few-piece portions. The technology ensures that only one piece of meat is dumped into each weighing pan.

The sensors constantly measure the opening of the gate to each pan and adapts the speed of the screw. This eliminates problems of duplets or triplets in the pans making it difficult to obtain uniform package sizes.

The intelligent and various speed control is an additional advantage that increases the capacity of the packing line. There is always a product in the screw feeder reducing the number of empty pans in the multihead weigher.

- The sensor gate technology enables precise portioning and thereby a significant reduction in give-away, concludes Johnnie Erichsen, Senior Vice President and CCO, Americas at Cabinplant.

www.cabinplant.com

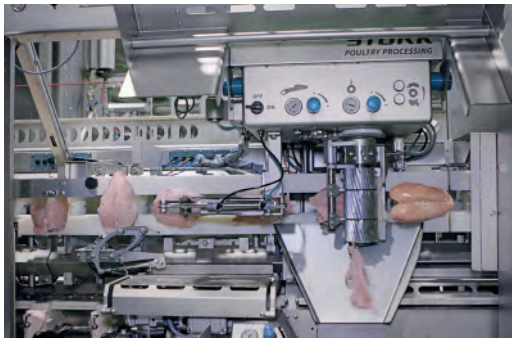
IPPE **Booth - B5319**

MAREL POULTRY'S INNOVATIONS

During the IPPE exhibition, Marel Poultry will focus on automation advancements and other new solutions that can help transform food processing in all aspects of the factory. A world's first is the AMF-i HD, particularly conceived for breast cap filleting of heavier broilers.

Smart Processing

Marel Poultry embraces smart processing and the team is excited to show different ways to help processors make smart moves throughout the factory. Visitors can learn about the entire range of Marel Poultry processing solutions, from live bird handling up to packing and labeling. All of Marel Poultry's innovations are driven by the passion for transforming food processing.



AMF-i HD

Today's broilers are getting bigger and heavier all over the world. It's not just in the US where 'big birds' are reared. Average chicken weights have increased markedly in South-America, Europe, Australia and Asia too. This is an unstoppable trend with quite some consequences for poultry processors. They have to adapt their systems to heavier weights and larger products such as breast fillets. Marel anticipated this trend with the development of its AMF-i HD system, an intelligent breast cap filleting system suitable for today's and future weight ranges. For the very first time, Marel will show the AMF-i HD in public at the IPPE.

A regular AMF-i filleting system can cope with usual breast cap weights and still have some margin left. With increasing bird weights, an HD version of AMF-i is needed to restore the margin. Compared to a regular AMF-i, AMF-i HD's processing range at the top end shifts upwards.

Thanks to its modularity, any existing AMF-i system can be turned into an HD version. AMF's intelligence concept, including the measuring system, can remain the same to function perfectly in the AMF-i HD. It can cope with a wide variety of uncalibrated breast cap weights. On display at the IPPE are the loading and skinning modules of the AMF-i HD, giving an impression of the heavy duty capabilities of the system.

FHF-XB Front Half Filleting

Marel's portfolio now offers breast filleting solutions for virtually every weight range. In addition to the AMF-i and AMF-i HD solutions, the FHF-XB system ensures that fillets of even very heavy birds can be processed. Unlike AMF-i, FHF-XB takes front halves, not breast caps, as the starting point to harvest breast fillets and tenderloins. It's also a fully automated, modular solution that can flexibly be configured according to the processor's needs, instead of using a pre-fixed set-up. Front halves stay in-line in the overhead conveyor all the time, fillets and tenderloins are neatly released on a belt.

At Marel's IPPE booth, the FHF Fillet Harvester serves as an example to show how the entire FHF-XB deboning line goes about.

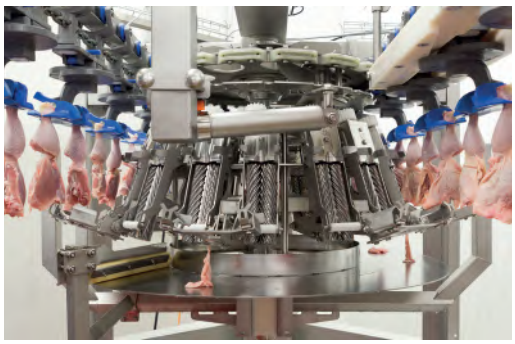
Robotization and Digitization

Robotization and digitization of the poultry industry are on everybody's lips today. Marel's Innova software platform turns poultry processing into a data-driven process. Sensors on virtually every machine in the line, together with weighers, scanners and vision graders gather all kinds of data to enable traceability, production control, quality control and performance monitoring (OEE).

Processing lines need to convert incoming broilers into high-quality end products and deliver the right product to the right customer at the right time. The only way to manage

all this is to implement an advanced software platform providing all possible scope for data collection. Marel's Innova software is just such a platform linking together virtually all machines in the plant. Innova empowers processors in their digital transformation journey to get the most out of their operations.

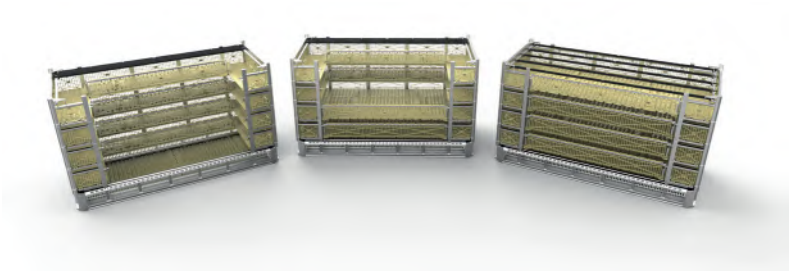
This transformation journey also includes an automation of human tasks, possibly using robots. The Multihead Weigher Large and the RoboBatcher, both on display at Marel's IPPE booth, are perfect examples of automated batching and packing solutions. They're both data-driven, using all information gathered along the processing line to calculate the best fixed-weight batches of legs, thighs, fillets or drumsticks, while minimizing give-away and maximizing profit.



More Automation

The increasing shortage of skilled human workforce drives the need for automation of operations in a poultry processing plant. Thigh filleting is such an operation that originally required much skilled manual labor. Only trained hands can make the right drumstick incision, remove the skin, separate thigh bone and meat and cut out the knee cap without any meat on. Marel's Thigh Fillet System, however, succeeds wonderfully in mimicking mechanically the work of a skilled manual operator, at high speed with maximized yield and consistence.

Once deboned, breast fillets and thigh fillets may contain occasionally some tiny bone particles. For humans, it is impossible to detect these bone remnants, as well as other contaminants such as metal, stone and glass. This process has to be automated too. That's exactly what the Marel SensorX machine does, by using cutting edge X-ray technology, combined with software that reduces the occurrence of false positives, but also detects difficult-to-find bone fragments more accurately. This means less rework, fewer operators and improved product quality.



Marel's new Compact Grader automates grading and possibly batching jobs. Apart from being a perfect start of automation for smaller operators, it can also handle temporary or seasonal overflows in larger processing plants. It will handle almost all poultry products, fresh or frozen: whole grillers, front halves, saddles, butterflies, split breasts, whole legs, thighs, drums, whole wings, breast fillets, leg meat and thigh fillets.

Even more automation can be expected from the I-Cut 130, also demonstrated at IPPE. It's the ideal in-line automated portioning solution for larger processing companies cutting fresh, boneless poultry meat into portions of fixed weight and/or fixed length.

Animal Well-being

At IPPE, Marel Poultry will also demonstrate the most advanced live bird handling system currently available, which pays close attention to animal well-being, sustainability, hygiene, and product quality. It is the revolutionary ATLAS Advanced Technology Live bird Arrival System. Part of this is the cleverly designed SmartStack module that not only gives high attention to animal well-being but also increases efficiency considerably. Combined with the CAS SmoothFlow's stunning solution, a well-proven, multiphase concept that enhances animal well-being and product quality, processors have a solution that benefits everyone. Several important North American processors already have shown their commitment to this humane concept by implementing the ATLAS and CAS SmootFlow combination.

Convenience Coating

Furthermore, Marel will demonstrate having plenty of solutions for convenience food processing. One of these solutions for creating attractive added value products is the flexible RevoBreader. This dual-mode machine is the ultimate solution for applying high-quality coating to home-style and homogeneously coated products.

www.marel.com/poultry

IPPE **Booth - B4207**

MULTIFUNCTIONAL MACHINES FROM STEEN

After the development of the ST840, further innovation was invested as there were more possibilities to improve the machine. Changing some minor elements on the initial design, the machine is now easily converted to a deboning machine as guides can now easily be set and removed. Therefore, the machine can be easily converted into a deboning machine for anatomical cut thighs, drums and prime wings.

In conjunction with the actual purpose of making pirzola, partially deboned thigh, from anatomical cut thighs, by rethinking the system, more possibilities were added. Here, different spacers can be used to determine how much you want to retract the meat on the bone. The major advantage is that anatomical cut prime wings can now be turned into a so-called "tulip" where the meat is pushed down the bone and the bone remains undamaged. This also means, that drums can be transformed into this similar product.

More Flexibility on the ST850 Turkey Deboner

Due to the needs of several customers, the ST850 was adjusted to give more flexibility towards the product. This deboning machine for anatomical cut thighs, drums and prime wings from male or female birds (left or right side), is able to debone all the above named parts with a minimum of adjustment and a capacity of 35 pieces per minute. Keeping in mind, that a very large weight range can be deboned on the same setting, the demand came to debone thighs and drums at the same time. Therefore, the pistons are now, as standard, implemented in the machine where the possibility of processing these thighs and drums from certain sizes on the same general setting is possible. However, the fact that each unit will be designated for its specific part, the time that can be saved in production flow is significant.

With the implementation of new upgraded cylinders, the required air volume is reduced by 30%! Limited impact and less friction also results in a longer lifetime of the diaphragms.

www.steen.be

IPPE **Booth - B7045**

WIPOTEC-OCS TO INTRODUCE COMPACT VERSION OF POPULAR X-RAY INSPECTION MACHINE

HC-M-WD-MDi Checkweigher

SC-2000"Mini" X-Ray Scanner

WIPOTEC-OCS, a leading manufacturer and supplier of precision in-motion weighing and X-Ray scanning equipment, will introduce a new compact member of its popular SC family of X-Ray inspection scanners at the International Production & Processing Expo (IPPE), January 28-30 in Atlanta. At Booth B4201, the company will debut the SC-2000 "Mini" X-Ray Scanner, which can inspect up to 400 products per minute with exceedingly few false rejects.

True to its name, the SC-2000 Mini is just 700mm in width, offering an outstanding process speed to footprint ratio. Highly modular for a comprehensive range of potential inspection setups, the machine features integrated conveyor technology with discharge units, and a switch cabinet can be configured separately from the measuring head. The SC-2000 Mini's external control cabinet

affords easy integration into existing production lines.

Also at IPPE, WIPOTEC-OCS will premiere an enhanced washdown system for its signature SC-WD-6000-B X-Ray Scanner. The latest bulk flow model meets protection class IP69K, making it suitable for wet environments and other challenging cleaning conditions. The module's C-shaped product space, beveled surfaces and stainless steel housing fulfill even the most stringent hygiene requirements.

Capable of inspecting many tons of bulk meat per hour and offering unsurpassed foreign body detection sensitivity, the SC-WD-6000-B X-Ray Scanner – like all machines of the SC series – is equipped with an HD-TDI camera detector. In conjunction with the metal-ceramic tube, it generates extremely high-resolution X-Ray images for the unit's custom-designed image processing software. The scanner's flexible ejection options ensure accurate separation of bad product while maximizing good product throughput.

Finally, WIPOTEC-OCS also will showcase what for the meat packaging industry has become the workhorse of checkweighers. Its HC-M-WD-MDi Checkweigher will be displayed with an integrated metal detector. Capable of handling up to 250 products per minute, the machine utilizes WIPOTEC's precision Electro-Magnetic Force Restoration (EMFR) technology, which enables extremely short settling times to deliver fast, accurate and repeatable weighing results. An intuitive software interface offers ease of operation, and the model meets all food processing industry requirements including IFS-compliant product control and other HACCP or LMHV/FDA hygiene regulations.

"Meat and poultry processors understandably need inspection solutions that are both exceptionally precise and extraordinarily efficient," said Jim Renehan, Senior Marketing Manager for WIPOTEC-OCS. "Our scanners and checkweighers have become mainstays at meat and poultry processing plants around the world thanks to their accuracy, repeatability and reliability. We look forward to showcasing our latest lineup of solutions at IPPE 2020 in Atlanta."

www.wipotec-ocs.com

IPPE **Booth - B4201**

MEYN AT IPPE 2020 - KEEP IT RUNNING!

At IPPE, Meyn launches the Maestro Plus, the new solution for in-line automatic organ harvesting for a wide variety of line speeds and bird sizes.

For the poultry processing industry, labor is still a critical issue, with poultry consumption rising at a time when workers are hard to find. Meyn offers solutions like the world's best automated breast deboning machines, configure-to-order service contracts to eliminate unplanned down-time, and a new version of Meyn Connect software to optimize efficiency in poultry processing.

World Premiere; Maestro Plus, Music for Organs

Meyn launches the new Maestro Plus for fully automated in-line organ harvesting at high speeds. The record high yield of Maestro's evisceration technology combined with new organ harvesting modules have again resulted in a solution with the highest yield in the market. Minimum waste, maximum profit.

The new Maestro Plus eviscerator first transfers the viscera pack to an organ shackle, positioning it for veterinary inspection. The viscera pack then goes through the intestine and gall remover (IGR). Next, the liver harvester (LH) scrapes the liver from the gizzard to be cleaned in a drum washer and presented on a liver inspection belt. The remaining heart with lungs and gizzard is separated into two streams by the heart and gizzard separator (HGS); the first stream goes to the heart and lung separator and the second stream presents the gizzards for further processing, either manually or automatically.

The launch of Maestro Plus follows over two years of testing in Europe, China and the US.

Keep it Running

Retail & wholesale buyers want it all. And on time. Unplanned downtime never happens at a convenient moment. Meyn offers tailor-made service contracts that reduce downtime to a minimum, including training for technicians and operators, technical support, scheduled maintenance, a parts safety stock, repair and equipment data analysis and even a full plant audit. All part of Meyn's configure-to-order service.

More News

During the IPPE show, Meyn will offer a schedule of frequent new product information sessions showcasing its advanced product line-up. Featured products include Meyn Connect's poultry processing performance software, a CO2 stunning system with a choice of continuous or batch stun, as well as the new Rapid Plus breast deboner M5.0 with its semi-automatic loading of front halves.

www.meyn.com

IPPE **Booth - B5413**

HIPERBARIC: GLOBAL LEADER IN HPP TECHNOLOGY

HPP (High Pressure Processing) technology is a non-thermal processing technique by which products, already sealed in its final package, are subjected to high level of isostatic pressure to kill microorganism like salmonella, E. coli and Listeria, extending the shelf life considerably without adding any preservative to the original product. HPP also preserves the quality of fresh food, opens opportunities to new markets for clean label products due to the extension of shelf life and protects brands against recalls. HPP is a highly versatile technology that can be applied to a wide range of foods: juices and beverages, meat, fish and shellfish, fruits and vegetables, dairy and Ready-To-Eat products.

Hiperbaric is the world leading supplier of HPP equipment for the food and beverage industry. Hiperbaric headquarters are located in Spain and offers a complete service to the US market from its delegation in Miami. Since its inception in 1999, Hiperbaric has designed, developed, produced and marketed its high pressure processing equipment internationally with hundreds of clients around the world. Its leadership is based on its full-integrated service that encompasses all the stages in the value chain from production to installation, including a 24/7 aftersales service and a high qualified team of HPP PhD's that assist the client in any aspect related with the product.

Hiperbaric offers the most reliable and productive units in the market endorsed by its more than 20 years of experience, its specialization in HPP and its constant R&D dedication. It also offers the widest throughput range of industrial HPP machines, meeting the requirements of start-ups, small-medium enterprises and large corporations. Among them, the Hiperbaric 525 model is the biggest and most productive HPP system in the world delivering more than 6,660 lb/h. Its capacity is unmatched with the lowest processing costs. All the units reach up to 6,000 bar / 600 MPa / 87,000 psi.

The horizontal layout and ergonomic design of all Hiperbaric equipment simplifies installation and operations. Intensifiers (high pressure pumps) can be installed alongside the machine or in a service corridor. It is also possible to set up the Hiperbaric machines in an integrated configuration, where the intensifiers are installed in a platform on top of the equipment. This design reduces the footprint and facilitates its implementation in a food industrial environment.

www.hiperbaric.com

IPPE **Booth - B7469**

LIMA: SEPARATION AT ITS BEST AT IPPE SHOW 2020!

As IPPE is fast approaching, LIMA company is looking forward to breaking new record numbers in terms of visitors and results, with high-quality contacts in the USA and the Americas.

Lima as a World Leader in Mechanical Separation will Exhibit:

Meat-bone separators for poultry for the highest quality of mechanically separated meat at high yields with:

LIMA RM 200 S, an all-around great test unit used regularly by FPEC in the USA for its customers to run tests in yet industrial conditions as this production machine has an hourly input capacity of 1 300 to 1 500 kg / hr / 2 860 to 3 300 lbs/hr of chicken carcasses. As any of its meat-bone separators, it enables to produce the high quality MSC (Mechanically Separated Chicken) or MST (Mechanically Separated Turkey) LIMA has made a name worldwide.

LIMA also proposes a full range of meat-bone separators for poultry from 100 kg / hr input capacity (220 lbs / hr) to 20 000 kg / hr (44 000 lbs /hr).

In particular, LIMA RM 2000 S is simply the biggest LIMA meat-bone separator for chicken, turkey or any poultry bones with an input capacity of up to 20 000 kg / hr (44 000 lbs / hr).

LIMA RM 2 000 S, already sold to several customers in Europe. The biggest poultry processors in the USA & the Americas can now take advantage of this outstanding superior quality and lower cost of ownership LIMA machine.

It was showcased lately at IFFA show in Frankfurt, Germany with new developments such as LIMA's PLC with color touch screen HMI with special features to offer a better assistance to production and maintenance operators.

Visitors Can Find Comapny's Latest Developments such as:

NEW LIMA RM 160 DSP deboner for pork bones and lamb bones is designed to complement company" acknowledged range of machines dedicated to pork bones and lamb bones separation. Its low-pressure technology allows very important reduction of the calcium level in the mechanically separated Pork and Lamb meat while keeping optimum yields. The result is a well-structured recovered meat with technological performances similar to a ground meat. This model can process up to 1 000 kg / hr / 2 200 lbs / hr of pork or lamb back and neck bones without any pre-grinding.

LIMA RM 400 DDM desinewer, thanks to its specially-shaped hopper for sticky products and its anti-bridging arm, it can be fed in big quantities such as with a column lift with meat trolleys. It is dedicated to the production of very high quality desinewed beef, lamb, poultry and pork meat which depending on the legislation can be labelled as meat and NOT MSM (Mechanically Separated Meat). The main advantages of LIMA's desinewers are: high yields from 80 to 96 %, optimized C/P ratios, low temperature increase.

The same machine can also be used as a deboner to get very high-QUALITY MSM in terms of texture, color & very low calcium levels, less than 1 000 ppm.

The range of more than 70 different LIMA models can process from 100 to 20 000 kg/hr (220 to 44 000 lbs/ hr) of raw product.

www.lima-france.com

IPPE **Booth - B4505**

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DYNACQ DETECTS PLASTIC IN FOOD PRODUCTS WITH HIGH SENSITIVITY AT HIGH SPEED

By Claus Borggaard, Danish Technological Institute

The food industry is keenly focused on preventing contaminants from reaching the consumer. Contaminants are defined as metal fragments, bone fragments and hard or soft shreds of plastic that have inadvertently ended up in produce, ingredients and products. If these go undetected in products leaving the factory, this can give rise to complaints, product recalls and perhaps even liability suits, all of which can be very harmful to a manufacturer's reputation. Metal fragments can be detected in products using a metal detector or an x-ray device. Bone fragments embedded in meat can only be found using an x-ray detector.

Automatically detecting small shreds of plastic in foods is a far more difficult task. Plastic cannot be detected in food using an x-ray device, as the fragments are often tiny, thin fragments of plastic film used to package the products before they are processed, or small fragments of aprons or gloves. Small, hard plastic fragments from belts, boxes and vessels are also a problem. As mentioned, these items are usually quite tiny, i.e. below the detection limit for an x-ray device, and plastic's ability to stop x-ray radiation is almost the same as the product surrounding it. Needless to say, plastic cannot be detected by a metal detector as it is usually neither electrically conductive nor magnetic. A powder can added to certain types of plastic to make it detectable by a metal detector, but in practice this procedure only works if large pieces of plastic are involved. Practical experience shows that these are usually tiny contaminations containing insufficient metal to be detectable by a metal detector in the product.

Up to now, the food industry's only safeguard against plastic contamination has been to deploy staff on the production line to inspect products to find plastic fragments and remove these from the product by hand. This cost-intensive process is ultimately ineffective as well, as visual inspection is an exhausting, difficult task for line workers, particularly at high line speeds.

DynaCQ – Plastic Detector

Vision-based equipment – named DynaCQ (Dynamic Check of Quality) – has been developed at the Danish Technological Institute. The equipment automatically detects fragments of plastic in foods during the production process. The equipment has been installed at a number of production sites, replacing monotonous, tiring manual labour. The equipment is capable of inspecting the surface of foods moving on a conveyor belt at speeds of up to 70 metres/minute. On a 70-cm-wide conveyor belt, the equipment can find plastic items as small as 2 x 2 mm, and often smaller. When the equipment detects a contaminant, it sends a signal to the conveyor belt's control system indicating that something has been found. This enables the individual contaminated product to either be removed from the belt manually after stopping the belt or to be removed automatically.

The vision equipment comes in two versions: a single-camera solution which is used if products can be spread out in a thin layer across the conveyor belt; and a dual camera solution, which inspects the upper and lower sides of the products.

DynaCQ Applications

DynaCQ has been used for the entry and exit inspection of produce and products such as sausages, protein powder and minced meat products. The equipment has also been successfully tested on bacon cubes, sweets and pizzas, where plastic contaminants can also cause problems.

As the equipment is colour-calibrated according to familiar colour standards, it can also be used to quality-sort produce used in the production process or in the exit inspection of finished products. In addition, DynaCQ can inspect ready-made pizzas to see if toppings are evenly distributed across the entire pizza surface.

For the meat industry, DynaCQ has also been developed to include programs for automatic product identification. The equipment has been "trained" to recognise different cuts of meat in boxes of meat from a cutting line or different individual cuts directly after the cutting belt. In these cases, the vision-based equipment can reduce the number of employees needed to verify box contents by hand – thereby increasing the line capacity, reducing the error rate and ensuring that products reach the right destination.

DynaCQ is designed to be a flexible, robust and hygienic measurement platform. It is also expected that it can be customised for many other food-quality inspection processes, e.g. in the fish industry, for by-products, etc. ●

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FACTS ON DETECTION CAPABILITIES FOR X-RAY SYSTEMS BASED ON CHICKEN BONE COMPOSITION VARIATIONS

By Joergen Rheinlaender

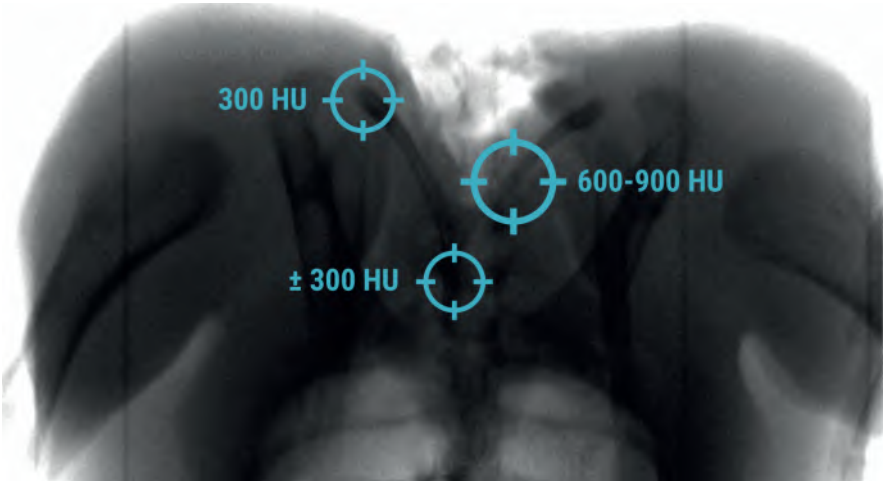
This presentation provides an explanation of why some bones can be detected by X-ray inspection, whilst others cannot. It also highlights the effects and benefits of accessing the lower part of the X-ray spectrum during poultry bone detection.

The testing of an X-ray system is typically based on selecting small bones and the cutting of small pieces of these bones. These cut bone pieces are subsequently placed into a chicken fillet or a deboned leg. The product is subsequently scanned by the X-ray system, and its ability to detect the bone in question is assessed.

However, a bone is not just a bone. The detectability of a bone depends on its calcification level. And the detection depends on the specific X-ray technology being used. Most important is the X-ray energy selection. At lower levels of X-ray energy and with longer wavelengths, i.e. below 30 kV, the contrast between bone and meat increases exponentially.

Revelations at the Lower X-Ray Energy Spectrum

X-ray systems for poultry bone detection typically works around 60-80 kV. The key reason is that the high energy is needed due to the sensitivity limitation of standard X-ray imaging detectors. This is unfortunate, since the contrast between bone and meat reduces exponentially with increasing energy. For some years, research in the medical and dental sector has brought new detectors with very good imaging characteristics down to 10 kV. These are very interesting for chicken bone detection, since the excellent contrast is matched with an excellent resolution. The detectors require a special long wavelength X-ray energy source which can provide a very high flux to ascertain a high signal-to-noise level. These developments have been tested for chicken and fish processing during the last 8 years, and provides crystal clear images of product irregularities, interfaced with auxiliary equipment for reject and sorting.



A chicken wish bone with the typical HU values of the bone in different positions. Based on information from the Danish Meat Research Institute, DMRI

Quantification of a Bone Calcification Level

The medical sector has worked with a quantification of tissue, bones, fluids etc for many years. This is due to using CT (computerized tomography) for medical diagnosis. The quantitative distinction is based on differences in X-ray attenuation using the so-called Hounsfield Unit (HU). This scale is based on water having the value of 0 HU, whereas air has the value -1000 HU. A calcified bone from e.g. pork is typically in the range 600-1000 HU (or beyond), whereas soft-bone (cartilage) is much lower (e.g. 100-250 HU), due to the lower abundance of calcium minerals (e.g. hydroxyapatite).

About the author:

Joergen Rheinlaender,
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InnospeXion ApS Denmark.

For chicken, the bone HU value depends on the age of the chicken, its feeding, its breed, and many others. For chicken in general food production, an average HU is about 400-450 HU for calcified bone, but varying from the level of cartilage (soft-bone) (100-250 HU) up to 1000 HU for the larger and most calcified bone.

Detection of Chicken Bones Relative to the HU Value of the Bone

Since the detection of a bone depends on the HU value of the bone, it makes no sense to consider only the dimension when evaluating the bone detectability. A comparison of different X-ray systems must therefore be made with the exact same bone pieces. This is difficult, since practical conditions may cause loss of the (very small) bone pieces used. The optimal solution therefore is to apply a test sample with artificial bone pieces (made of a polymer with hydroxyapatite) with a HU value (i.e. around 400-450) as the average chicken bone.

Concluding Remarks

The above analysis unveils that the comparison of different X-ray systems should be based on standardized test samples. It is also clear that quality control verifications of X-ray system detection capability (as performed e.g. on an hourly regular) must be based on well known, certified and calibrated test samples. It makes sense to use test samples with HU values in the range 400 to 450 HU, as these conform to the average range of calcified bones in general chicken production.

By accessing the lower spectrum of X-ray energy and using longer wavelength X-rays, it is possible to detect bones around 1 mm, also in cases when the bones that are less calcified (lower HU values) these can be detected, even when much larger than 1 mm. ●

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EXPLORING TECHNOLOGY IN THE FOOD INDUSTRY

With an anticipated global population increase and consumer preferences changing, food and beverage manufacturers must prepare now to ensure that they can meet demand. As a result, many manufacturers are turning to new technology to help them keep up. Here, Darcy Simonis, industry network leader for food and beverage at ABB, discusses the technology being used and the impact it is having on the industry.

There are many factors affecting the way food and beverage manufacturers handle their processes. Whether it's the need for more efficient processing, the growing population or consumer preferences and attitudes constantly changing, food and beverage manufacturers must ensure that they can stay ahead. For example, food and lifestyle trends like veganism and plant-based food have taken the industry by storm. In fact, it was reported that there were over 600,000 vegans in the UK in 2018. This demonstrates why it's essential for manufacturers to be prepared to adapt.

Food Through AR

For many, Augmented Reality (AR) is a normal part of everyday life. Since the boom of Snapchat filters and lenses, AR has become extremely popular and is now more commercially accessible than ever. With the AR market in Europe estimated to hit twelve billion dollars by 2024, industries are finding many applications to integrate this cutting-edge technology into daily practice – and the food and beverage industry is no different.

Staff working in a food and beverage facility can be trained through virtual instructions and scenarios, where it is possible to virtually visualize working and operating in the facility. This method of training could enable a more productive workforce to be trained at a quicker rate, compared to traditional and manual training.

AR can also enhance consumer experience. Some manufacturers have designed products that have labels displaying nutritional or recipe information when AR is used. However, some suppliers are taking this one step further. A New York bakery, for instance, uses AR to display a 3D view of their products for customers to view before they place an order. Using AR in ways like this could increase sales as it means the customer can see the food or finished product before they commit to purchase.

3D Printing Food

Another technology that's being increasingly used in the food and beverage industry is 3D printing. Currently, 3D printing technology is being applied to industries such as automotive, aerospace and packaging, but it is now making its way into the food and beverage sector. In fact, it is predicted that by 2020, the global revenue for the 3D printing market will reach $21 billion.

One German company is using 3D printing to create 3D printed jelly meals for elderly care home residents that may have difficulty chewing or swallowing solid foods. As the potential uses of 3D printing are developed, the benefits that this technology can offer are becoming further understood. 3D printing food can produce precise results and save time and effort.

While 3D printing has the potential to provide innovative food to the growing population much faster compared to traditional methods of manufacturing, it also provides options for the industry to be more environmentally sustainable. 3D printing only uses the required amount of raw materials to make a finished product and the hydrocolloid cartridges that are used in 3D printers form a gel when mixed with water and leave minimal waste.

Blockchain Technology

Consumer attitudes to food have also changed. Whether

it's ensuring that produce is grown sustainably, plastic waste is kept to a minimum, or even eliminated altogether, consumers now want to know every detail about the product they're buying – and blockchain technology can provide just that.

Through blockchain, consumers can verify the history, origin and quality of a product. Blockchain is benefitting the industry as it builds trust between the supplier, manufacturer and consumer, which in turn can increase brand loyalty. It can also reduce food waste by identifying problems along the way, such as contamination or storage issues. If problems are detected at an early stage of the production process, it can be resolved before it hits the shelves. This could help reduce food waste and eliminate the need for product recalls.

Most food manufacturers should already have software installed that monitors, records, and traces product ingredient details. ABB offers its 800xA distributed control system (DCS) or the ABB AbilityTM Manufacturing Operations Management (MOM) system, which traces and records an ingredient and logs the data in a database for manufacturers to refer to.

It is still uncertain exactly how the growing population and consumer preferences will impact the industry, but manufacturers need to ensure their facilities are equipped with the latest technology in order to adapt to the constant change. Manufacturers should embrace these developments in technology and apply them to their production processes as failure to prepare could jeopardize their position in the industry. ●

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THE DIGITALIZATION OF FAST FOOD

The Arrival of Artificial Intelligence (AI) and Plant-Meat

By Henk Hoogenkamp

Wellbeing, health, great taste, clean label and ecological sustainability are today's key drivers influencing consumers' purchase decisions, particularly in the affluent societies. This is especially true for the Millennial and Generation X-consumers. Knowing all these wants and needs, it can be expected that the food industry continues to go through a disruptive transition and the end is nowhere in sight. Winning with words, or "storytelling" are nowadays "essential ingredients" for food companies who want to successfully communicate a growing consumer affinity for products including social or ethical causes. After all, it is very important to recognize the important marketing rule that "when people are not consciously including, they are subconsciously excluding".

The food industry is adapting to changing consumer expectations in an on-demand affluent world as home-cooked meals are on the decline, and meals eaten away from home and away from restaurants are expected to accelerate. Instead a greater proportion of the food intake will be substituted by food delivered from virtual restaurants, cloud-kitchens, subscription food services and grab-and-go pickup stations. Especially cloud-kitchens -sometimes grouping together different food specialities under one roof- will continue to rapidly grow and disrupt the traditional food service markets. Consumers will become increasingly loyal to third-party delivery apps, and as such a risk of impacting brand loyalty to individual restaurants. The surviving restaurants likely will become smaller, not larger. Automated food preparation kitchens and evolving individual dietary restrictions will accelerate menu changes to provide specific health benefits.

The Story of Success

For the success of a new brand or an ingredient, it is crucial to entice the consumers with a story outlining why they should buy the product. In this day and age, consumers are informed and influenced by social media and their purchase decisions are based on health, taste, price, transparency and honesty. This is especially true for the emerging generations who want to know where their food comes from. Differences in generational eating habits need to support well-being and mental-health, particularly for people managing healthy lifestyles around work, families and social peer interactions. Add to that the

growing number of consumers who expect food companies to package all of these complicated variables into sound and easy-to-understand stories explaining the merits of the product.

For example, the use of chemical and unsustainable ingredients can lead to a variety of issues for both consumer health and the true interpretation of sustainability. The sustainability issues are now so deeply embedded in the entire supply chain - from core agriculture to food processing and ending at the environmentally friendly products. Increasingly, the Millennials and Generation X-ers want to know what is in a product and are seeking out simple-to-understand ingredients to understand how it benefits their health and well-being. However, sustainability is not just about counting carbon credits, it also encompasses ethical and social values, and often its role in peer-dominated social media influences.

Social Media Health

Literally out of nowhere, social media has created an overwhelming pressure for brands and consumers to interact. Initially, the legacy food companies underestimated the change in social dynamics and its effect on purchase decision making. It therefore comes as no surprise that particularly young people -teens- are fully engaged with food and drink brands. Unfortunately though, a massive 90%+ is related to brand platforms such as unhealthy snacks, candy, sugary drinks and fast food. Social brand engagement targets peer influenced groups. This is designed to make products and services seem fun, cool and daring. Food companies should not relentlessly promote their least healthy -but good tasting- products, but instead accept social responsibility and find common ground by introducing health alternatives.

However, as the teens are still attracted to less-healthy foods, the Millennials and Generation X-ers are setting the stage for a new era of food dynamics. The traffic to roughly 14,000 McDonald's US restaurants continues to stagnate. Part of the decline is due to consumers switching to food that they view as more healthy. Much to the chagrin of franchisees, McDonald's US has invested heavily in updating mandated investments in digital ordering kiosks. This seems to have resulted in an orchestrated push-back from franchisees or owners making these huge capital investments. Another underestimated issue is the all-day breakfast menu and some complex menu-board offerings that -in some restaurants- have significantly slowed down restaurant operations, including increased wait-times at drive-throughs.

McDonald's tests new P.L.T. made with a Beyond Meat patty in Ontario

Face and Voice Recognition

As consumers in affluent societies turn to healthier alternatives, traditional fast-food sales are slowing across various target groups. To reverse the trend of the traditional salty and greasy fast food, subtle menu board changes are made including the addition of plant-based meat alternatives. These strategies attract a younger crowd which can be considered a cultural shift as these business evolve. Besides adding plant-based food options -like the Beyond Meat Burger- to the familiar array of favorites such as the Quarter Pounders and Chicken Nuggets, also artificial intelligence (AI) is quickly becoming a strategically essential tool to anticipate a customer behavioral decision making. For example, digital ordering boards and camera technology using facial recognition or license-plate numbers, allow a fast food company to define a list of suggested purchases based on previous visits taking into account such factors as the weather, time of day, the popularity of foods as well as the length of the wait. Drive-through businesses have taken a page from internet algorithms and personalization to collect consumer data and then use that information to encourage more spending.

As the fast food industry grows more competitive, food delivery apps allow the opportunity for gathering consumer information. This includes the use of Bluetooth devices tracking real-time consumer's movements. Actually, it seems as though the large fast food companies are ultimately transforming quasi-technology business platforms into an e-commerce that happens to sell food. The bottom-line is that the recommendation algorithms and voice recognitions built into ordering systems have generated larger orders, not only fattening the profit but also the waistline of the consumers. After all, when looking at delicious food pictures, it is hard to resist the temptation to splurge. Critics of artificial intelligence have long warned that the technology eventually will lead to a dystopian future in which humans are subordinate to computers. It remains to be seen, but the unintended consequences have the potential to further worsen the current obesity crisis by driving up unhealthy eating habits. Despite all good intentions, it will make it difficult for people to find moderation. ●

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GEA PACKAGING DAYS 2019: SAFE AND SUSTAINABLE FOOD PACKAGING THAT MINIMIZES FILM USE

With sustainability increasingly important in food packaging, it's only logical that packaging systems not only need to be efficient, safe and flexible but also conserve energy and resources. GEA product experts demonstrated the technology group's solutions for this segment at this year's Packaging Days, staged at the Biedenkopf plant (Germany) in November.

During the GEA Packaging Days at the Biedenkopf plant, customers informed themselves about solutions in the field of sustainable food packaging.

Over two days, more than 220 participants were welcomed at the well established event. They gathered information on equipment solutions that meet food producers' various requirements regarding optimized packaging quality, safe and economical packaging processes as well as better recyclability coupled with reduced film usage. The event focused on the GEA PowerPak PLUS packaging machine as well as covering every step in the packaging line from feeding, through inserting, cutting and sealing, to labeling and separating. To ensure the highest packaging quality, all individual modules are tailored to each customer's requirements.

The A team: GEA PowerPak PLUS and GEA DualSlicer

The lecture series kicked off with a presentation on the GEA PowerPak PLUS thermoforming machine and compatible GEA DualSlicer. Attendees were given proof positive of a packaging process that makes rapid film changes extremely simple while minimizing film wastage. Characterized by its premium cut quality, low give-away and high yield, the slicer can be perfectly adapted to suit the relevant product. As tried-and-trusted solutions, both machines are reliable, easy to operate and ensure stable processes.

The GEA PowerPak PLUS packaging machine offers extremely easy, simplified and fast film change with minimal film loss during the packaging process.

FoodTray: a Sustainable Packaging Solution

An exploration of topics revolving around reduced film consumption and recycling subsequently highlighted FoodTray, a system solution for sustainable food packaging. The tray concept combines corrugated paperboard and plastic film to create a consumer-friendly packaging system for fresh foodstuffs. Automatically assembled on the GEA Thermoformer, the two

materials can easily be separated after use for appropriate disposal.

Solutions for Multi-Layer Packaging

Increasingly, multi-layer or double-layer packaging is being used to facilitate the handling and presentation of fresh products. This is in keeping with the trend toward smaller package sizes at grocery retailers' and discounters' fresh foods counters. The upshot is lower film consumption. Due to the technical need for two loading systems, however, the thermoformer's cycle speed is reduced. The long-term purchasing behaviour of the end customer will ultimately decide whether machine technology will prevail. The industry can always rely on GEA for the appropriate Solutions.

Photo GEA

The FoodTray paperboard / film composite solution can be almost completely recycled and is versatile in use.

Greater Flexibility with Gea Smartpacker

The appeal of the GEA PowerPak Plus, with its good 12-month track record on the market, is matched by the GEA SmartPacker. With a simple format change, this versatile vertical form-fill-seal packer can handle up to seven different pouch designs. GEA works closely with plastics manufacturers from as early as the film development stage. Extensive testing ensures that the SmartPacker provides packaging companies with proven solutions for reliable and sustainable product packaging that consumers can dispose of in environmentally friendly ways.

Alongside practical solutions, the GEA Packaging Days also showcased a number of the Fraunhofer Institute's projects that aim not only to enhance packaging safety during transport but also explore the state of the art in recycling composite films. The event wrapped up with basic guidelines on packaging recyclability in line with the new German Packaging Act.

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PACKAGING CONCEPTS AND METHODS FOR PRESERVING MEAT QUALITY

There are different packaging concepts depending on the particular product and the processing stage within the added value chain. This means that different technology and packaging materials are required, when transport or maturation packs for example are being produced, from those required for retail packs for the end consum-er. In addition to the high demands placed on hygiene and functionality, one of the most important objectives of a pack is to provide extended shelf life for the product.

Meat is a valuable food product. It is therefore essential, that all those involved in the process chain exercise the greatest care in handling the product. One important aspect of this is the product processing, which should be as sparing on resources as possible. But there is also special importance attached to the packaging, since this contributes to preserving quality and extending the shelf life of the product, thereby also contributing to reduc-ing food waste. Essentially it depends on the product to determine, which is the most suitable packaging con-cept, method, or technology.

Transport Packaging

Transport or maturation packs are generally used for larger pieces of meat in the B2B sector. These industrial packs protect the wholesale meat primals from external influences, while also minimising the effects of the meat drying out. The packs are used for transporting the product from the supplier or abattoir to the meat processor, sausage producer, wholesaler, local butcher or caterer, and they are also used for transporting product within individual processing companies. One other benefit: the meat can mature in the pack and therefore improve still further in quality. This is used primarily for beef. A good example of this is roast beef, which is transported from South America to Europe, where it is further processed.

An ideal type of packaging for these large meat cuts are vacuum packs or shrink packs, which are produced on chamber machines or chamber belt machines of different output categories. Selection of the appropriate ma-chine depends on the products to be packed, their size, and weight and also the required output or level of effi-ciency. If the products to be packed are evenly sized, alternative packaging concepts to packing in film pouches may be used, and these enable a higher degree of automation to be achieved. One example of this is ther-moforming packaging technology.

Retail Packs

In the case of retail packs, the marketing aspect is an additional objective. The pack must be presented attrac-tively at the point of sale and encourage the consumer to purchase the product. Product differentiation features include the visual appearance and sensory feel, the visibility of the product in the pack and its printing or label-ling, as well as other functions such as opening aids, reclosure features, or ease of stacking on the supermarket shelf.

In parallel with this, there has been a trend in recent months towards greater sustainability in packaging and a higher level of environmental awareness, which have been influenced by the discussions about the use of plastic packs, the EU Packaging Strategy, and current packaging legislation. This trend has a direct effect on the design and production of packs, as well as the packaging materials used. This means when packing food products, only as much packaging material should be used as is absolutely necessary to protect the content of the pack. In addition to this, alternative packaging solutions, particularly paper fibre-based materials, are also gaining in importance for the meat industry, as well. This is because they contribute significantly to increased pack recycla-bility.

Depending on the product and the expectations of both the retail trade and consumers, there is a wide spectrum of retail packs available, ranging from rigid thermoformed packs and pre-made trays to flexible packs in a wide variety of designs. Examples of these are vacuum packs, vacuum skin packs, and shrink packs. In addition to the chamber and chamber belt machines already mentioned, there is a whole range of suitable thermoforming packaging machines and traysealers, which can be selected for the different requirements.

Methods for Preserving Meat Quality

Vacuum packs or MAP packs are generally the preferred type of packaging for preserving the quality of the meat product and extending its shelf life. The differences in the various products do however require the packaging concept to be designed in individual ways. In principle both methods are comparable in the contribution they make to the microbial effect on shelf life.

Research institutes, universities, leading machine and film manufacturers, as well as recycling companies are all systematically working on suitable packaging technology to extend shelf life and preserve product quality. One current example is the QualiMeat project, which is being sponsored by the Interreg Europe program and runs until December 2019. The six partners involved - the University of Kempten, Innsbruck University, Innsbruck Man-agement Center, MULTIVAC, the Kempten Center for Food and Packaging Industry, and NATURABIOMAT GmbH - are researching the interaction of various packaging systems and materials on fresh meat. The aim is to optimise packaging materials and processes for improving the preservation of fresh meat quality.

Vacuum Packing

In the case of vacuum packs, the extended shelf life is achieved by removing the oxygen (O2). Otherwise the oxy-gen would quickly cause spoilage of the food through chemical or biological processes. The vacuum prevents the growth of aerobic microorganisms, such as pseudomonads. Despite this however, the metabolic processes of anaerobic lactic acid bacteria continue in the vacuum pack, and these also of course grow on the meat. Due to their metabolism, these lactic acid bacteria produce carbon dioxide (CO2), which dissolves gradually in the meat and reduces the pH value of the product. This process stems the growth of other bacteria.

Oxygen or the removal of oxygen also has an effect on the colour of the meat. The meat's colour essentially de-pends on its myoglobin content and state. The myoglobin is responsible for the intramuscular transport of oxy-gen, and it is present in different quantities in the various products. Lean pork, for example, contains only 2 grams per kilogram of meat, while beef on the other hand can contain up to 20 grams per kilogram. Since there is predominantly deoxymyoglobin in freshly cut meat, it has a purple colour, which appears paler or stronger depending on the type of meat.

But this colour is not stable. Depending on the particular type of meat and its processing, the deoxymyoglobin oxygenates into oxymyoglobin at a higher concentration of oxygen. The original purple colour of the meat then changes to a brick-red colour. If the oxygen content is reduced to a low value, or the meat is stored for a long time, the unattractive brown-coloured metmyoglobin is automatically produced. The meat may actually still be faultless from the microbial point of view, but it is often no longer accepted by the consumer due to its visual appearance.

If the oxygen is largely removed, as in the case of vacuum packaging, this also creates more stable preservation of the meat colour - and therefore a higher level of consumer acceptance. If the oxygen is removed completely from the pack, the colour of the meat tends towards purple again thanks to deoxymyoglobin. But the quality of the meat also plays

an important role here. If the reduction capacity is not sufficient to metabolise the residual oxygen, which is present in the pack and dissolved in the meat after the packaging procedure, the meat appears brown despite the absence of oxygen in the pack. However, this tends to be accepted by the consumer in the case of beef in vacuum packs, for example more than with pork.

Another aspect which should be taken into consideration: with vacuum packs, the escaping meat juice is not caught by an absorbent pad, as is the case when packing under modified atmosphere, but rather the juice col-lects in the cavities around the meat. These cavities can be reduced by shrink or skin packaging, whereby the film is pulled skin-tight around the meat by means of a special process, and this reduces the escape of juice significantly.

The different vacuum packs can be produced on thermoforming packaging machines, as well as traysealers and chamber machines. Two attractive versions of the vacuum pack, which have become established in the market, are vacuum skin packs and shrink packs.

Diversity of Vacuum Packs - Vacuum Skin Packaging

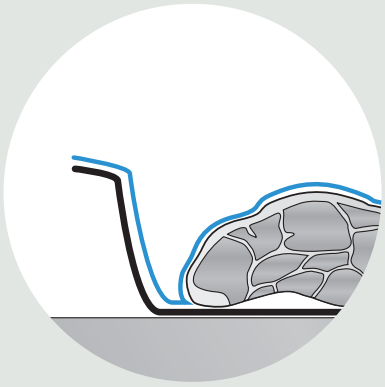
Thanks to their high level of product protection and their attractive appearance, vacuum skin packs are on an upward trend in the self-service retail sector. This type of pack involves the upper web being tightly draped around the product without tension like a second skin, before being sealed to the entire surface of the lower web or pre-made tray. The product is not distorted and keeps its natural appearance. The food product is also fixed firmly to the base of the pack or tray, so that it can not slide around, and it can therefore be presented at the point of sale as either a stand-up pack, a hanging pack or a conventional horizontal pack. The vacuum in the pack contributes to an extended shelf life for the product. In addition to soft meat like fillet pieces, other prod-ucts with sharp or hard features, such as bones for example, can also be packed securely in this type of pack. If vacuum skin packs are stored in the freezer, they also provide reliable protection against freezer burn.

It is however essential to select suitable film material. The mechanical properties of the upper web must be de-signed for the shape and height of the particular product, so that even those products with high protrusion or sharp features can be packaged attractively and securely. Suitably dimensioned standard trays must be used for producing vacuum skin packs on traysealers. With thermoforming packaging on the other hand, reel-fed upper and lower webs are used to produce the packs. In addition to logistical and financial benefits, the advantages of reel-fed materials lie in the fact that universally used films can be utilised and there is a higher degree of flexibil-ity, since packs can be produced to individual designs, for example with specially formed contours or other features.

MultiFresh™ from MULTIVAC is a special process for producing vacuum skin packs which can be made on both thermoforming packaging machines and traysealers. The comprehensive machine range meets all the require-ments of pack size, output, and

Vacuum

Packaging under vacuum extends the shelf life of products since the biochemical degradation of the product is slowed down by the removal of the atmosphere. As the products may be compressed in the process, vacuum packs are only suitable for food which is not sensitive to pressure.



MultiFresh™

MultiFresh™ vacuum skin packaging uses a special skin film, which encloses the product without tension like a second skin and seals to the entire surface of the lower web. The upper web passes through a heating station to activate the film properties, and it is then pre-stretched in the sealing die.

level of automation. The special MultiFresh™ films combine functional benefits with outstanding visual properties. MultiFresh™ packs are characterised in particular by their high level of trans-parency and brilliant gloss – and they also offer optimum product protection, while at the same time ensuring an extended shelf life is achieved for the product.

Diversity Of Vacuum Packs - Shrink Packaging

In the case of shrink packs on the other hand, the product is vacuum packed in a special shrinkable film. The shrink properties of the film are activated by brief contract with hot water. Conceived as a cost-effective and automated alternative to conventional packing in shrink bags, FormShrink® was developed by MULTIVAC as its own unique process, whereby very thin thermoformable films with special shrink properties are used to envelop the product on all sides, like a second skin. The perimeter sealing produced by a thermoforming packaging machine gives seal seams with a high level of strength and durability. An integrated shape cutter is used to au-tomatically cut out the packs with their protruding upper web, and the cutting process is so accurate that, in con-trast to conventional shrink packs, the film trim at the edge of the pack is reduced to a minimum. Thanks to FormShrink®, every product has an individually tailored pack, regardless of its shape and size.

Packing Under Modified Atmosphere (MAP)

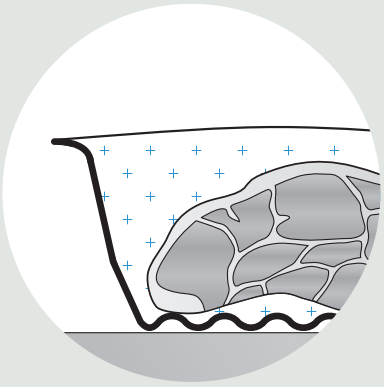
MAP packs are frequently used to pack fresh products in the self-service retail sector, such as minced meat, gou-lash, and shingled steaks or chops. In the case of MAP packs, the natural atmosphere in the pack is replaced by a modified atmosphere appropriate for the particular product. The gas mixture is typically made up of oxygen, carbon dioxide, and nitrogen. When determining the modified atmosphere for the particular product, the chemi-cal processes, which take place during the storage of the product, must always be taken into account, particularly since the barrier properties of the packaging material can never be 100%.

When packing fresh meat, a mixture of 60 to 70 percent oxygen and 20 to 30 percent carbon dioxide is used. The amount of oxygen must be tailored individually to the necessary CO2 quantity, and the required barrier properties of the packaging material have to be tuned to the expected storage time and required shelf life. The desired brick-red meat colour, which consumers associate with product freshness and quality, is prevalent at oxygen concentrations above approx. 21 percent. But oxygen can also, under some circumstances, have a nega-tive impact through loss of water and toughness of the meat. In addition to this, oxidation products from fat and protein can also arise. The individual meat-processing company must however make its own evaluation about the extent, to which these effects are actually perceived as negative, since they will probably remain almost imper-ceptible, given the relatively short shelf life of the product.

The CO2 has a bacteriostatic and fungistatic effect, since the pH value of the meat is reduced by the CO2. This contributes significantly to an extension of the product shelf life. When combined with low storage temperatures, bacterial

Formshrink

The FormShrink process uses special, extremely shrinkable thermoforming films. The finished packs pass through a shrink unit. The shrink properties of the film are activated by the heat effect of the hot water, and the film then lies tightly around the product.



Modified Atmosphere (MAP)

In the case of packs with modified atmosphere, the atmosphere in the pack is replaced with a gas mixture, which is matched to the product. This usually consists of carbon dioxide, nitrogen, or oxygen.

spoilage is effectively stemmed. The temperature and change of pH value have a significant influence on colour, consistency, taste, and shelf life during meat maturation.

However, the problem is compounded by the fact that CO2 migrates from the pack more readily than O2. It also dissolves partially in the product. This causes the amount of CO2 in the pack atmosphere to change more than the amount of O2 over the storage period. These two aspects must also therefore be taken into consideration, when determining the gas mixture, so that the extended shelf life can be achieved and the best possible quality level maintained. If too much CO2 is added, the pack may collapse under some circumstances during the storage period due to lower internal pressure - and a so-called pseudo vacuum arises. If too little CO2 is added, it may not completely develop its bacteriostatic function, and the effect in regard to shelf life extension is therefore less marked.

MAP packs are produced primarily on thermoforming packaging machines and traysealers. After the pack cavi-ties or trays have been filled with the product, the atmosphere in the pack is modified by means of either gas purging or back flushing with the special gas mixture, after a vacuum has been drawn in the pack. The upper web is then sealed to the formed pack. A wide range of packaging materials made of various plastics, as well as paper fibre-based materials, are available for producing MAP packs.

Vacuum or MAP?

It is difficult to answer the question regarding which form of packaging is best suited to which type of meat. Both vacuum and MAP packs contribute to extending shelf life and enhancing the attractive presentation of the prod-uct. An important criterion is however the shape and form of the product. Compact pieces of meat such as fillets are primarily vacuum packed, whereas portions of minced meat or goulash tend to be in MAP packs in the chill cabinet.

As regards preserving the product's colour or achieving optimum colour stability, the vacuum pack is superior to the gas-flushed pack, since the colour remains constant over the storage period - assuming the packaging mate-rial has an adequate oxygen barrier. In the case of gas-flushed meat, the desired red colour can be achieved through oxygen, but the stability of the colour does however depend very much on the meat quality, the produc-tion process and the storage conditions.

The preservation of the meat quality has to be judged in conjunction with the microbiological and sensory shelf life of the product. A high bacteria count or large bacteria growth represents not only a health hazard to consumers but also a loss of product quality. This can be established, for example, by the smell or state of the meat. Irrespective of the microbial parameters, the sensory shelf life of the product can be detected by a colour change, which represents for the consumer the first and most immediate criterion for judging freshness.

From the microbial aspect, the distinction is somewhat more difficult. Since carbon dioxide through gas exchange is not present in vacuum packs, this is only formed by microorganisms such as lactic acid bacteria in the meat itself. As described above, the CO2 is of significant importance, since it has bacteriostatic and fungistatic effects, and in conjunction with low temperatures it stems the growth of microorganisms. In association with the slower metabolism of anaerobic bacteria, this contributes significantly to extending the shelf life of the product. However, due to the growth of lactic acid bacteria, an unpleasant and sour smell may be detected after the pack is opened, but this disappears after a short period of time.

In MAP packs the effect of carbon dioxide also stems the growth of other aerobic bacteria, such as pseudo-monads, so that the oxygen content has less of an influence from the microbial point of view.

As a matter of principle, it is recommended that for each product, its particular characteristics and the environ-mental conditions are factored into the calculations, and also that the interaction with the packaging material is fully investigated. The interaction between the machine and the packaging material also has a significant influence on the quality of the pack and therefore also on the product - as well as on the efficiency of the overall packaging procedure. As a leading machine manufacturer, MULTIVAC supports its customers from the very beginning. Its range of services extends from comprehensive advice and technical support through to pack tests and sam-ple productions, and right up to collaboration with leading film manufacturers for the development of specific packaging materials for individual customer requirements. ●

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- Conveyors and Belting
- Skin and Whole Muscle Packaging Trends

2 APRIL

Ordering Deadline: 14 April, 2020
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- INTERPACK Review
- Mincing, Blending, Mixing, Filling, Forming Technology
- Burger Patties and Meat Snacks
- Disposal and Wastewater Treatment, Energy Efficiency, Processing of Left Over Parts
- Energy Efficient Packaging Equipment Trends and Solutions

3 JUNE

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- Dicing, Strip, Cutting, Slicing
- Smoking, Cooking, Coating, Frying
- BBQ Trends, Snacks& Sides, Natural Ingredients Trends
- Marinades, Clean Label, Meat-Free Alternatives
- Sustainable Packaging Trends

4 SEPTEMBER

Ordering Deadline: 14 September, 2020
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- **NEW: Agroprodmash Special Supplement (In Russian)**
- Sausage, Bacon and Ham Production
- Casing, Netting, Clipping, Labelling
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- Vacuum and Skin Packaging Trends

5 OCTOBER

Ordering Deadline: 12 October, 2020
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- Extracting and Processing of Poultry Meat
- Vacuum Pumps
- Food Safety, Hygiene, Disinfection
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6 DECEMBER

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