

MEATINGPOINT

magazine

SUSTAINABLE TECHNOLOGY, PROCESSING & PACKAGING

**GOOD
ANIMAL HANDLING
BEFORE
SLAUGHTER
IS ALSO
GOOD BUSINESS**



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THE WAY OF THE FUTURE
AROUND THE WORLD**

**PLANT MEAT:
CARNIVORE NO MORE
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Dear reader,

It gives me great pleasure to welcome you to the first edition of Meating Point Magazine for 2019. As the new editor, I've enjoyed spending my first months assembling this issue, and also getting to know the industry, writers and readers. I am very aware of the responsibilities that the editor's role entails, and I approach my new role with both excitement and some trepidation! However, I am fortunate to be supported by a highly effective team, and thankful for the warm reception.

Thanks are also due to my predecessor Tristan Bogaard. Over the past 4 years he has done a fantastic job, shaping the magazine to ensure it has maintained its place among the leading international publications addressing the meat, poultry and seafood sector.

I am honoured to be entrusted with a publication that doesn't just report on news, developments, latest innovations in the meat, poultry and seafood industry; it stands for creating value. We embrace the idea that business serves a purpose that goes beyond profitability, and that a responsible and sustainable companies can inspire innovation and be a vehicle for progress. We believe these higher goals don't contradict for profitability. On the contrary, we're convinced businesses that reflect and embody them will be tomorrow's leaders. We are passionately interested in animal welfare, resource efficiency, circular economy, businesses that are beginning to innovate to tackle the impact on the environment, and achieving effective design and sustainability when it comes to meat packaging.

I look forward to work with all of you as we welcome your submissions, as well as feedback as authors, readers, and reviewers of the magazine.



Jenny Smart

Enjoy your read!

PUBLISHER:

MEATING POINT MAGAZINE Ltd.

8A Cedar Avenue, Ruislip, HA46UH,
London, UK

TEL: +44 (0)20 8581 2341

FAX: +44 (0)20 8581 2341

E-mail: info@meatingpoint-mag.com

www.meatingpoint-mag.com

EDITORIAL BOARD:

Jenny Smart

editor@meatingpoint-mag.com

Ben Anthony

banthony@meatingpoint-mag.com

Steliyana Vasileva

svasileva@meatingpoint-mag.com

MARKETING TEAM:

Aylin Nedzhib

marketing@meatingpoint-mag.com

Meylin Kara

support@meatingpoint-mag.com

Zvezdelina Kehayova

subscribe@meatingpoint-mag.com

DESIGN:

Taner Kyuchuk

design@meatingpoint-mag.com

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- * Food Safety, X-ray, Metal Detection, Check weighing
- * Tray Sealing and Thermoforming
- * Disposal and Wastewater Treatment, Energy Efficiency, Processing of Left Over Parts

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K+G WETTER SETS NEW HYGIENE STANDARDS

The Family Business from Hesse Scores Highly with Clever Solutions for Industry and Trade

This year's IFFA is approaching and, with it, the excitement of what's new to discover in the meat industry. The anticipation is also growing at K+G Wetter. In Frankfurt this year, the Hessians will present machine solutions that not only excel with their top performance, but also with their famous fine details – and bring more efficiency to industry and trade. K+G Wetter is offering a special highlight for industrial companies too. "IFFA is one of the most important international trade fairs for the meat industry and we are delighted to be back again. This year we have developed a highlight for all meat processors in the industry which we will be presenting for the first time at the trade fair and which sets new standards in terms of hygiene", reveals Managing Director Andreas Wetter. K+G Wetter will also be presenting clever solutions for trade businesses in its package at the trade fair.

Cooking System for More Efficiency

One innovation at the K+G Wetter booth is the cooking system. Stronger than ever, it now boasts the new 120-litre vacuum bowl cutter (VCM 120), which will also be presented at IFFA, as an advantageous extra. The special features of this further developed solution: The sausage meat can now be heated faster than ever before. K+G Wetter has succeeded in accelerating this process by 30 percent – which of course has a direct effect on the cost-effectiveness of the process. Steam consumption is also reduced

by 30 percent thanks to a special double-wall solution in the cutter bowl. With the completely enclosed system, K+G Wetter has implemented a solution that is also unrivalled in terms of hygiene.

Hygienic Down to the Smallest Detail

K+G Wetter is also constantly working on solutions in the field of grinders that will make meat processing in trade and industry more efficient. The innovative "Easy Access" on the newly developed angle grinders and mixer angle grinders E 130/G 160, for example, has more than proven itself in practical use. The generous opening allows direct access to the grinder hopper. This makes it much easier to add spices or other ingredients. The mixing shaft as well as the feeder worm

© K+G Wetter



In practical use, the innovative "Easy Access" has more than proven itself on the newly developed angle grinders and mixer angle grinders E 130/G 160, which allow direct access to the grinder hopper.

quickly – which is exactly the same for cleaning. For maximum hygiene and efficiency, K+G Wetter has also further optimised the manual and pneumatic sorting device on its grinders and mixer grinders.

© K+G Wetter



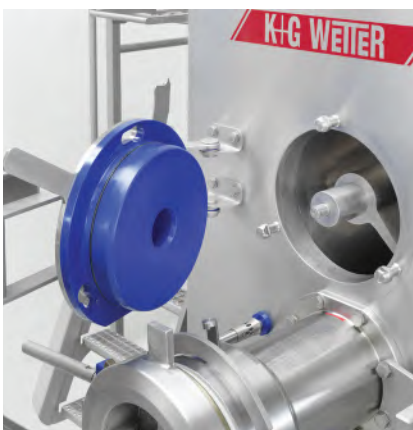
With the new cooking system, which is optionally available exclusively for the VCM 120, K+G Wetter has realised a solution that is also unrivalled in terms of hygiene.

It discharges hard parts laterally and can be installed and removed within seconds. The connection of the drive to the locking mechanism of the new sorting system can be easily separated without tools via a plug-in connection. This allows the user to clean the individual components particularly easily and thoroughly.

The automatic grinder AW K 280 has the optimised sorting device too and scores highly with further specific features that make the work much easier. Designed for industrial plants with special requirements, the automatic grinder can process both fresh meat and frozen meat blocks quickly and efficiently. As a new

feature, the machine is equipped with an optimised feeder worm counter bearing, which is now attached to the machine body with hinges. Instead of removing the counter bearing, it can be opened easily without tools. For cleaning, the feeder worm is pulled forward only a few centimetres. An internally installed cleaning nozzle automatically cleans the worm intake.

Strong Grinding Service Directly From the Professionals



Clever in the details: The new feeder worm counter bearing can be opened easily and without tools.

In addition, K+G Wetter also supports its partners from the butcher's trade and the food processing industry with a strong service. Because machines in meat processing usually run at full speed, the sharpness of the bowl cutter knives and grinder cutting sets must be one hundred percent reliable. This is the only way to ensure they work efficiently and cleanly. This is why K+G Wetter offers its partners a solid and fast all-round service for the professional regrinding of bowl cutter knives and grinder

cutting sets. If the performance of the knives or cutting sets decreases, the K+G experts will provide the correct sharpening again within the shortest possible time and return the

tool immediately. For quality that you can taste in the end.

www.kgwetter.de

IFFA Hall 8.0, Stand D96

IFFA


4. – 9. 5. 2019
Frankfurt am Main

Meet the Best

IFFA. One world-leading trade fair, one focus: meat. From hand-crafted to high-tech, this innovation platform presents the industry trends of the next 3 years. It is the meeting place for experts from industry, retail and the butchers' trade – for the first time also in the new Hall 12!

www.iffa.com

info@messefrankfurt.com

 **messe frankfurt**

LIMA : QUALITY IN SEPARATION - A GROWING RED MEAT DESINEWING MARKET FOR LIMA

Most of its customers know LIMA for "hard separation" that is separation of meat from bones at high yield to produce conventional MSM (Mechanically Separated Meat). This is still LIMA's main market worldwide with its range of LIMA S meat-bone separators and LIMA has built over all these years a strong reputation as a world leader in meat bone separation.



RM 400 DDM

However, it is important to underline the fact that LIMA has started developing its desinewing technology since 2008 and that LIMA is currently making a bigger and bigger name for itself in the industry for desinewing, that

is separation of meat from tendons, sinews, cartilages, bone chips out of trimmings, shank meat, aponeurosis and bone-out meat in general with its range of LIMA DD and DDM desinewers. The recovered meat is a HIGH-quality meat.

Typical high yields are obtained, from 80% to 96% while C/P ratios remain under controlled values and the temperature hardly increases during the process.

These desinewing applications are for poultry, pork, beef meat, lamb meat, bone-out meat in general.

Lately, specifically in France, with the change in the legislation, as the desinewed meat has now its own denomination as "pressed meat" in France, two major minced beef meat processors decided to invest into LIMA RM 400 DDM desinewers with their specific hopper and anti-bridging arm.

One important point is that desinewed meat whatever the country is never

considered as MSM (Mechanically Separated Meat) but meat indeed.

Many customers in Europe and overseas, are already taking benefit of the high-quality recovered meat from LIMA DD / DDM technology. They also enjoy the very simple yield adjustment and short down time for cleaning. This range of desinewers have a capacity of 100 kg/hr (220 lbs/hr) up to 12 000 kg/hr (26 500 lbs/hr), and have all the benefits you can expect from the Quality in Separation, LIMA can offer, such as:

- No extra pre-breaking or pre-grinding,
- Low temperature increase,
- High efficiency,
- Low maintenance cost,
- Quick pay back

To know more about these equipment and desinewing applications, come and meet LIMA at CFIA hall 5 Stand D58

www.lima-france.com

IFFA Hall 9.0, Stand C51

COST REDUCTION WITH NEW WEIGHING SYSTEM FROM HANDTMANN



The WS 910 weighing system is a new development that Handtmann will be presenting to the industry specialists at the IFFA 2019 for the first time. With the multifunctional VF 800 series vacuum fillers, Handtmann has developed intelligent portioning and control modules for modern production processes. They function, among other things, as the central control module for networking and synchronisation with other process

modules, such as the new Handtmann WS 910 weighing system.

The new WS 910 weighing system from Handtmann offers cost reduction through minced meat products with guaranteed accurate-to-the-gram weights. It is particularly useful in the application areas of minced meat and in the production of formed products. The WS 910 weighing system with the SB 912 sorting belt

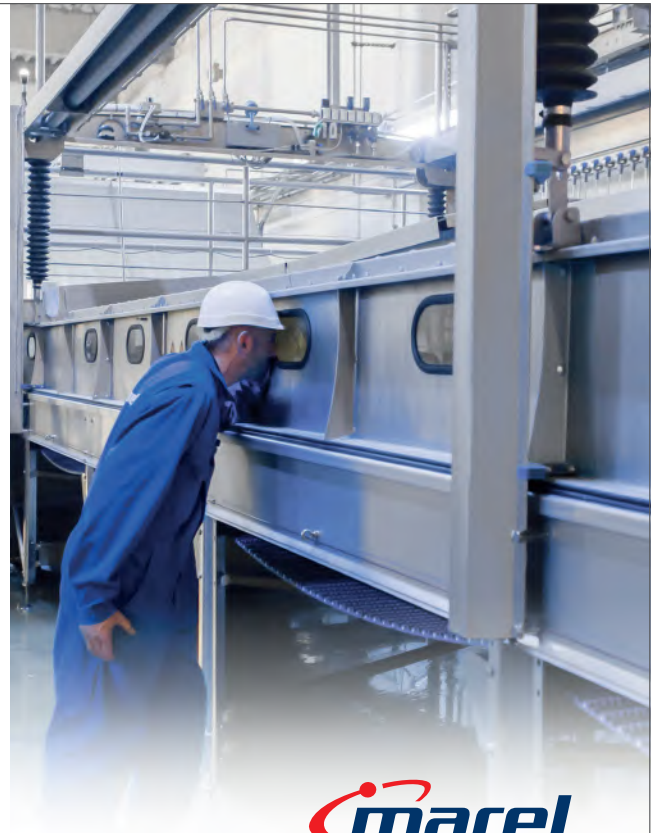
SMOOTH STUNNING SECURES YOUR PRODUCT QUALITY

CAS SmoothFlow

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Handtmann WS 910 weighing system with SB 912 sorting belt. Process control via VF 800 monitor control system

is always part of a turnkey solution, integrated into a production line for process monitoring. The main functions comprise production control, monitoring and weight control, as well as ejecting under- or overweight portions after the forming and portioning process. The weighing system also forms part of the Handtmann LineControl concept. On the one hand, this ensures user-friendliness (product selection via the vacuum filler only; setting of

the scales and communication then automatically in the line), and, on the other hand, process reliability due to increased line efficiency.

Using the new WS 910 weighing system with SB 912 sorting belt eliminates the need for rework, and results in savings in packaging, resources and handling. Fewer product ejections due to weights accurate to the gram further boost the production line's

efficiency and production output. Reducing give-away to a minimum by providing 100 % control through reference weighing of each portion, also helps achieve significant cost savings.

The IFFA will see live demonstrations of the new weighing system in a line solution for the production of minced meat products – from filling to depositing into the packaging: Hall 12, Stand A80.

www.handtmann.de

THE FAMILY MANAGED MOGUNTIA FOOD GROUP PRESENT THEIR ENTIRE RANGE OF PRODUCTS AND SERVICES AT THE IFFA



The family managed Moguntia Food Group, with its solid roots in Germany and Austria, will show its entire range of products and services for the first time at one stand. The globally operating group presents its individual brands Indasia, Moguntia, Haya4you and Fleischer on 350 square meters under one roof in the new exhibition hall 12.1.

„This eye-catching overall presentation symbolizes, not least in times of international group acquisitions, that a medium-sized family business too can be powerful“, stresses manager and board member Johannes Tonauer. Moguntia's customers from the meat industry, butcher trade, general food industry, fish industry, dairy industry, food service and trade benefit from the coherent overall solutions and concepts of the Food Group.

In addition to the appropriate starter culture from our own production, the company group offer seasoning

and spice blends, marinades, sauces, technological additives, convenience foods and much more. Since its founding in 1903, it has been on the pulse of the times. Therefore, innovative start-ups are also an increasing market of the company group. Nutritional concepts such as halal, kosher, vegan and vegetarian are realized as conscientiously as the development of innovations for the "right seasoning."

The Moguntia Food Group sees itself not only as a supplier, but also as a source of ideas and as a problem solver for its customers, which is why sustainable novelties and holistic concepts are included in the "trade fair" program, such as free-from-products, vegetarian compounds, the award-winning counter concept „Les Trésors“ and the product revolution „Liquid Spice“.

www.moguntia.com

IFFA Hall 12.1, Stand C10

RSS 70 - MAXIMUM CUTTING PERFORMANCE

REX Technologie - Cutting System and Sausage Separator



The REX cutting system RSS 70 is both flexible and universal; it is suitable

to be used as a stand-alone device as well as a variant in combination with the REX calibration system RKS 85. In doing so, the fully-automatic process after twisting is very profitable and extremely efficient in terms of labour, providing a short term return on investment.

The tripple sickle knife precisely separates the sausages at the twist

section. This increases the cutting performance which is supported by the REX servo-drive. Whether sausages in natural or artificial casings can be used, the RSS 70 is always successful due to its extremely high cutting performance.

The smooth machine housing designed according to the typical REX hygiene design and entirely

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www.steen.be



ST850

Turkey de-boner, thigh, drum and prime wing

ST700

High-yield skinner for various whole fish, fillets and poultry parts such as turkey, chicken, duck, pheasant, ...



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of the control units during cleaning. The large 12" touch-screen control is comfortable to operate and ensures simple programming.

The control can also be synchronised with the filling machine control. As a result, this facilitates the handling and monitoring of the overall plant in the "in-line" process. The feed and discharge belts, which can be easily adapted to the respective sausage calibre, ensure a secure guiding of the sausages into the cutting unit, whereby even the curved goods can be easily processed. Thanks to the optional available newly developed electronic calibre adjustment, product changing is simplified and maximum process security guaranteed.

The RSS 70 is easy to operate "in-line" in conjunction with the REX calibration system RKS 85. In doing so, the fully-automatic process after the twist-off is very profitable and it increases the performance.

The control can also be synchronised with the filling machine control. As a result, this facilitates the handling and monitoring of the overall plant in the "in-line" process. The large touch-screen control is comfortable to operate and ensures simple programming on the RSS 70 or directly on the vacuum filler. All models in the RVF 400 S and RVF 700 series have an "in-line" connection option.

made out of stainless steel is easy to clean. The standard protective cover guarantees optimal protection

RVF + RKS 85 + RSS 70 - Compatible and ubiquitous

www.rex-technologie.com

IFFA Hall 8.0, Stand D80

TOMRA FOOD INTRODUCES NEW DETECTOR FOR THE POULTRY INDUSTRY

Consistently high quality, reliable ejection of defective products, as well as less waste of valuable food - this is what TOMRA Food, part of the TOMRA group with headquarters in Leuven, Belgium contributes to with innovative sorting systems. The leading manufacturer of sensor-based systems in the field of food processing is now entering the poultry industry with a new unique detector for breast filets and butterflies.

TOMRA QV-P - Poultry Meat Detection

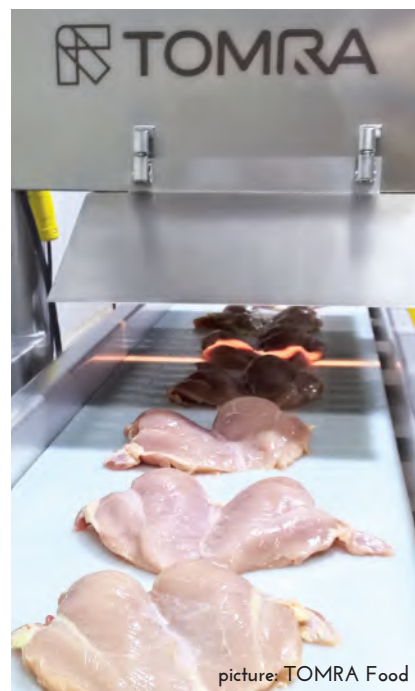
The filtering out of poultry breast fillet, which is interspersed with firm connective tissue, poses great challenges for quality control in the poultry industry. With the TOMRA QV-P, a unique patented detection system for poultry meat with this abnormality known as "muscle myopathy" or "wooden breast", can now be reliably sorted out. The system thoroughly scans the continuous product flow, classifies the meat in real-time and ejects flawed breast fillet. The user-friendly system can be



picture: TOMRA Food
TOMRA QV-P setting new standards: innovative detector for poultry breast fillets

easily integrated into existing lines or is available as a stand-alone version. The recorded measurement data can be retrieved as reports at any time and ensure complete documentation and traceability of the processes.

Bruno Gabriel, sales manager process analytics at TOMRA Food, says: "With the TOMRA QV-P our customers will not only be able to reliably sort out the affected products, though they will also have the ability to monitor each flock, making it possible to monitor each grower and compare for differences



picture: TOMRA Food
TOMRA QV-P - reliably classifying poultry breast fillets in production

being it in the feeding, climate etc. The TOMRA QV-P is the perfect addition to our portfolio for the meat, turkey and seafood business and we are pleased to take the next step in helping our customers to meet the industry's demanding requirements."

Chris Begley, Sales Director of Vanguard Processing Equipment Ltd, TOMRA agent for the UK and Ireland says: "British consumers eat chicken twice a week, on average, and as a result Britain's poultry sector is among the largest in Europe. This can lead to quality issues due to highly intensive farming. The TOMRA QV-P detects and grades chicken fillets in line according to muscle defects. It results in higher end-user quality and enables accurate grading for further processing."



picture: TOMRA Food
Chris Begley - Sales Director of Vanguard Processing Equipment Ltd, TOMRA Food agent for the UK and Ireland



picture: TOMRA Food
Bruno Gabriel - Sales Manager Process Analytics, TOMRA Food

www.tomra.com/food

IFFA

Hall 9.1 Stand D30

ROBOBATCHER GETS A FIRM GRIP ON STYLING

With supermarkets' insistence on attractive presentations, tray styling is a hot topic among poultry processors. Marel's new RoboBatcher Flex grippers are the perfect answer for fillets, drumsticks and whole legs. They allow fixed-weight batched products to be placed into trays according to patterns chosen by the user. Despite their amazing speed, they handle products with utmost care, and also save labor.



RoboBatcher's new grippers meet supermarkets' demand for styled trays of fixed-weight batched fillets, drumsticks and legs.

Soren Raahauge, Marel Product Manager Robotic explains; *"Improvements in styling performance also save labor, as there is much less need for trimming or restyling afterwards. This is a welcome benefit as finding qualified staff is becoming a bigger challenge for poultry processors everywhere."*

Don't Drop

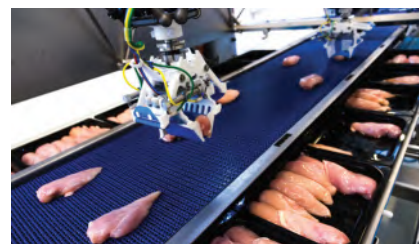
The RoboBatcher's vision system detects the orientation of every product on the belt, passing this information to the gripper. This allows for it to adjust its

angle, always picking up the product in the same way. The new grippers do not "drop" products into the tray, as bounce would cause a loss of control over how products land. Instead, the gripper moves to the bottom of the tray to release product at exactly the right spot. The jaws of the gripper open no more than necessary, which is particularly important for the last product in a tray.

Smart Grippers

In tray packing situations, the tail (end) of a breast fillet may protrude over the edge, making sealing impossible. The new RoboBatcher fillet gripper has a tail bending device, which pushes tails down when picking up fillet. The gripper then descends into the tray. Grease on the tray and protruding tails no longer compromise sealing performance, which results in unequalled automatic styling.

The smart jaws of the new drumstick and whole leg grippers pick up products in the most favorable way, so that their position, while moving,



makes it easy to arrange them side by side in the tray.

Fast Moves, Easy Exchange

RoboBatcher moves quickly with acceleration forces of up to 10G; a heavy gripper could slow performance and risk damage. RoboBatcher's new lightweight grippers feature many 3D printed synthetic parts with fewer bolted joints needed, so they can move around more quickly. They are also much easier to clean.

All grippers connect to the base in the same way and have a quick change adaptor. Changing grippers to handle a different product can be done simply by hand - no tools needed - in less than a minute.

www.marel.com/poultry



VACUUM FILLER & PORTIONING SYSTEMS





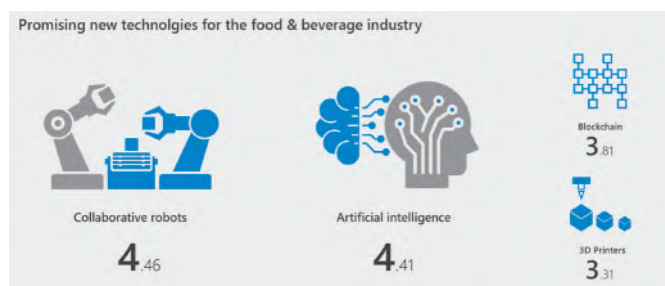
Hall 8.0 / D 80

REX Technologie GmbH & Co. KG
 +43(0)6235-6116-0
sales@rex-technologie.com
www.rex-technologie.com



SURVEY HIGHLIGHTS THE OPPORTUNITIES AND CHALLENGES OF DIGITISATION IN THE FOOD INDUSTRY

Many food manufacturers consider digitisation will have a huge role to play in the future of the food sector – but the majority still see a number of hurdles that need to be overcome in order to maximise the opportunity.



This was a key finding of the 2018 CSB-System survey which canvassed the opinions of decision-makers within the food and beverage production industry across 29 countries. Respondents identified increasing retailer requirements, strict international legislation on food and traceability, and growing consumer demand for quality and freshness as key challenges that information technology (IT) could help to solve.

Potential benefits outlined included networked production becoming the standard, which will bring producers and consumers much closer together. Producers will be able to create increasingly personalised products cost-effectively and placing orders directly with the manufacturer will become more commonplace.

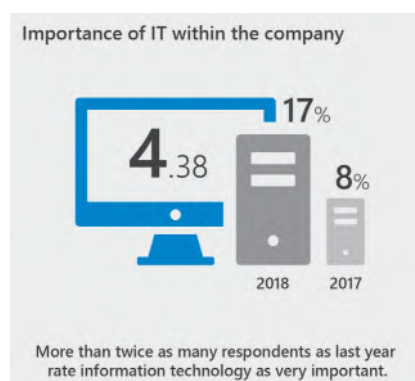
Although these factors mean that twice as many respondents than in the 2017 CSB survey rated IT as 'very important', the figure was still only 17%. Furthermore, only 15% of respondents spend more than 1.5% of their turnover on IT, while nearly 70% do not invest more than 1% in digitisation. This compares to medium-size US enterprises which, according

to Forrester analysts, spend 4.3% of turnover on IT.

The survey identified the main barriers to digitisation to be lack of employee skills and low awareness of what solutions are available on the market. CSB says working with a suitable IT partner can help companies to tackle the four major issues that enable companies to move towards

achieving a Smart Food Factory. These are a need for increased transparency; enhanced digitisation in marketing and sales; additional digitisation of factory processes; and improvements in quality and traceability.

ERP systems will have a critical role to play in this and will remain the focal point of many processes in food enterprises, as most companies are familiar with these systems and respondents saw many benefits. However, the survey found that they also think the demands on the systems can be too high, and they would like to see greater user-friendliness, advanced documentation capabilities and more analysis options for their existing systems.



In terms of latest technologies that may have an impact on the food industry, collaborative robots and artificial intelligence were rated the most highly. Much less is expected of 3D printing and blockchain, with investment in 3D printing losing momentum after a promising start. Decision-makers do not currently see blockchain gaining a foothold in the food industry in the near future, although its adoption by large retail players such as Walmart and Carrefour may change this.



"Our survey demonstrated that there is a strong recognition among food manufacturers of the benefits of creating a Smart Food Factory, but there is still a lack of knowledge and understanding that is preventing many companies from investing heavily in IT and digitisation," comments Frank Braun, CSB's head of marketing.

"For many companies, therefore, selecting a suitable external supplier may provide the necessary support and guidance to maximise the many opportunities that digitisation offers, in particular in improving business performance and profitability."

www.csb.com

NEW COMPANY NAME, COMBINED STRENGTH

Bastra Starts the New Year With Industry - Experienced Partner In a Highly Focused Manner



Combining strength: Claudia Buse (fourth from the left), managing director of BASTRA GMBH and her team as well as the partners of the family-owned Mittelständische Beteiligungsgesellschaft (MB) from Osnabrück are looking forward to working together.

With a clear focus and a new company name, BASTRA starts the new year stronger than ever. In the industry, the family-owned company which was founded in 1946 in the Sauerland region has always been known as an expert for high-quality cooking and smoking installations. This experience and expertise is now further enhanced by Bayha & Strackbein GmbH in order to provide an even better service for their customers from trade and industry under the new name BASTRA

GMBH. To this end, the globally active company has joined forces with the family-owned Mittelständische Beteiligungsgesellschaft (MB) from Osnabrück which has also proven industry know-how. "We are very pleased to share common values and network valuable knowledge to be used as of now for the best benefit of our customers. We are already full of ideas," says Claudia Buse, née Bayha, who is the third generation running the company.

Therefore, BASTRA will present some new developments, products and services directly at the IFFA 2019 with which the experts intend to make their national and international customers' work easier. "Our roots are in the craft sector and this is where we want to remain a strong and proven partner in the future. With innovative developments in the field of industrial machines, it is, at the same time, our goal to further expand our

sales activities in this segment and to use our large sales service network in Germany and abroad to do so. We also see significant potential for growth in the food retail sector. After all, more and more deli counters are installed where meat and sausage products as well as fish products can be freshly prepared and attractively presented in our cooking and smoking installations," says Claudia Buse, outlining the company's future course of action.

In addition to being a strong partner, BASTRA clearly includes providing a strong service. Therefore, customers are not only provided with a Germany-wide network of certified service partners. BASTRA also trains its employees within the company to ensure fast and



Since 1946 BASTRA has been known in the sector as an expert for high-quality cooking and smoking installations.

competent support before and after the commissioning of a production line. Therefore, customers can rely on BASTRA as usual: Everything is going fine.

www.bastra.de

IFFA Hall 8.0, Stand B50



Located in the Sauerland region, BASTRA develops high-quality cooking and smoking installations in its modern factory which are installed in more than 80 countries throughout the world.

SMARTCASINGS FOR CLASSIC, VEGETARIAN AND VEGAN SAUSAGE

According to Innova Market Insights, snacking will continue to be one of the leading trends in the food industry. For example, 83 percent of millennials snack instead of eating big meals, due to time constraints. Sausage is a classic snack, whether as hot dog, currywurst or salami stick, whether meat or plant-based. Hydrosol has developed the perfect casing for all these sausages – SmartCasings based on alginate. By means of co-extrusion sausages can be made in all standard sizes.

SmartCasings are a small revolution in sausage-making. A liquid alginate layer is applied to the sausage mass and then hardened into a firm structure in a calcium bath. The result is a strong and edible casing that gives sausages a crisp bite. What's more, this casing is and will remain available in unlimited quantity, and also offers processing advantages. *"The stabilising system is based on a complex mix of highly reactive hydrocolloids and starch. Synergistic effects upon exposure to a calcium chloride solution lead to the formation of a casing with good elasticity and tensile strength,"* explains Hydrosol Product Manager Florian Bark.

Stabilisation and "packaging" from a single source SmartCasings are

suitable for fresh bratwurst, raw sausage and scalded sausage. They are highly tear-resistant, and with raw sausages in particular they give a pleasantly soft bite. The technology can also be made to work very well for scalded sausages, as Florian Bark reports: *"Scalded sausages are a special challenge, as they are exposed to damp heat both during manufacture and later during preparation. So the casing needs to be not just tear-resistant, but also adhere to the sausage mass after cooking. To make sure it does, the sausages are cooked not by hanging in steam, but instead in a water bath using a special technique."*

For best results, the casing and sausage mass should be well adapted to each other. This is true for all product categories, but especially for scalded sausage. *"Here, our long experience in stabilising sausages is a great benefit, as in addition to the casing we can always offer the right stabilisation for the sausage mass. We take into account the specific phosphate content, salt content and viscosity of the mass. Thus, we offer the entire package for sausage-making, inside and out."*

Advantages of alginate casing SmartCasings offer many advantages over conventional sausage casings. They permit a continuous manufacturing process, which results in low production costs. With SmartCasings there is no wastage or rework from intestine changes.

Alginate cases also enable higher hourly throughput than is possible with conventional filling technology. The highly automated production technique requires less manual



intervention and so has lower personnel costs.

Furthermore, unlike cellulose casings there is no peeling step. There are also savings in material costs, as alginate casings are substantially more economical than natural intestine, collagen and cellulose casings.

Hydrosol SmartCasings also have another advantage – they are supplied as a powder. This gives them a much longer shelf life than finished pastes, rendering preservatives superfluous. Transportation and storage costs are also much lower with powder than with pastes. The SmartCasing powder can be made into a paste at any time. Hydrosol currently offers two powder versions, SmartCasing M as the standard version with animal protein and SmartCasing VR for vegetarian and vegan sausages. Hydrosol SmartCasings are available in halal and kosher versions.



www.hydrosol.de

NEW NOCK SKINNING MACHINE FOR WHITE FISH AT THE SPG 2019 IN BRUSSELS

The German manufacturer NOCK will exhibit their new SKINEX SBW 496 WHITE FISH, automatic skinning machine for all white fish species in hall 4, booth no.4-6333 at the SEAFOOD PROCESSING GLOBAL (SPG) in Brussels.

With the new, flexible NOCK MULTI-DISC® upper pressure belt, this machine skins white fish such as cod, pollack redfish, haddock, wolffish, halibut, pike perch and other white fish species particularly, gently, reliably and reaches the highest yield. The machine offers 2 skinning methods: pulling off the skin with a blunt blade (silver

skinning) or skinning with a sharp blade (stepless from thin to deep, favoured with the optional blade holder technology NOCK ACTIVE SKIN GRIPPER® ASG).

The fillets pass through the machine virtually horizontally without deflection, thus preventing damage to the inner fillet and avoiding the V-shaped splitting of the tail.

As with all NOCK fish skinners, the conveyors, pressure unit and the



blade holder can be easily removed without tools for cleaning purposes.
www.nock-gmbh.com



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7-9 May 2019 in Brussels
Hall 9, Booth No 4026

GLOBALG.A.P. News Conference
8 May 2019, 3-4 p.m.
Hall 11, Room 1123, 3rd Floor

www.globalgap.org/aquaculture

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DICED HAM PRODUCER GOES FOR WEIGHING TECHNOLOGY FROM MULTIPOND

The family-owned company in the Westphalia region of Germany was founded in 1931 as an abattoir and since then has been considered a driving force on the German meat and sausage market. Meat and sausage products have been the focus for three generations. The company philosophy is: Quality, craftsmanship and innovation for the customers. "In Recent years, there has also been heightened consumer awareness about product safety, quality and hygiene", says Jörg Timpe, Technical Manager at H. & E. Reinert in Versmold. And so more than ever before, the top priorities in the meat-processing industry are safety, quality and hygiene. Therefore, the company relies on the multiple-head weighers from MULTIPOND for good reason. Recently, an additional weighing system, type MP-30-1000-400-J, for weighing diced ham has been acquired for the factory in Versmold.

The limiting room height of 4.50 m was the greatest challenge for this project. Every millimeter counted in the planning stage. The gap between system and ceiling is just a few millimeters. "This is very special equipment construction. From our previous experience, it was

clear that only MULTIPOND can do this.", explains Timpe.

The diced ham is transported onto the platform via an inclined belt conveyor supplied by Grönweg. Another feed conveyor transports the diced ham onto the weigher. This multihead weigher is of the latest machine generation. The central theme of this new generation is hygienic design - and even down to the smallest detail. The J Generation was developed and realized specifically for use in areas demanding extremely high hygiene requirements. "The weigher's hygienic design was, without doubt, another reason for our decision to go with MULTIPOND. MULTIPOND is here a good step ahead of the industry as a whole.", says Timpe.

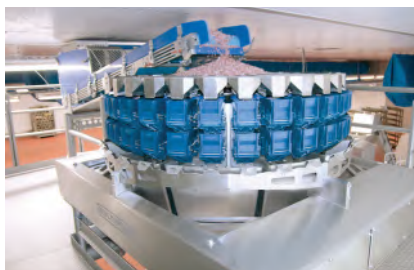
Once the diced ham has arrived on the weigher, it is first conveyed to the prefeed hoppers by the radially positioned feed trays and then to the weigh hoppers underneath. Using the partial portions, a computer determines the combination that comes closest to the 125g target weight. All product contact parts are precisely adjusted to the production requirements and the

properties of the diced ham in order to guarantee a smooth product flow. The weigher is controlled and operated using a convenient color touchscreen monitor. The fully automated calibration of the proprietary load cells ensures the highest accuracy and availability through the integrated calibration weight in each weighing cell. MULTIPOND is the only manufacturer of multihead weighers worldwide - who fully automatically, calibrate whilst running. The 30-head weigher is equipped with a 3-way outlet. A motor-driven timing hopper installed under each of the outlets transfers the portions to the downstream transfer system.

The gimbal-mounted transfer system with incorrect weight Reject was designed specifically for this application by Grönweg represents the interface between weigher and packaging machine. Swivel hoppers distribute the weighed portions into the 6x3 format hopper. The subsequent, Rise and Fall 6x3 format Distribution unit ensures that the portions are transferred correctly into the trays of the downstream thermoforming machine and the sealing seams remain dry in the process.

The entire system was designed for an output of 12 times 18 packages per minute. The target weights of the end packing are from 75g to 125g. The mean value achieved, a decisive criterion for the give-away, corresponds exactly to the target weight. The standard deviation with 125g of target weight is approx. 1.3g. Jörg Timpe is extremely satisfied with the results: "MULTIPOND delivers what it promises."

The hygienic design of the weigher is the basis for fast and simple cleaning. All J-Generation multihead weighers have protection class IP 69 as standard. Timpe explains "the weigher undergoes daily a complete wet clean. During this



process, the weigher is literally placed "under water". The quick and tool-free removal of product contact parts effectively reduces the system's downtime for cleaning and maintenance work to an absolute minimum. A wash wall from Gröneweg additionally installed on the platform also simplifies the cleaning process many times over.

Drawing on its long-standing experience of weighing the most difficult products, MULTIPOND was at our side offering a wealth of knowledge, says Jörg Timpe. Our extremely positive experience with MULTIPOND in the past was yet another key decision factor for Reinert. The weigher is now the fifth multihead weigher from MULTIPOND. All MULTIPOND systems run almost fault-free and are completely reliable. The excellent on-site service was another decisive plus point for MULTIPOND.

"The weigher's hygienic design was, without doubt, another reason for our decision to go with MULTIPOND."



Jörg Timpe, Technical Manager at
H. & E. Reinert in Versmold

MULTIPOND has been an owner-managed German company since the very beginning. Drawing on more than 70 years' experience in industrial weighing technology, we are a pioneer in this sector. Our success is based on the high quality and excellent technical standard of our weighing systems. We consciously commit to a high level of vertical integration, as well as production exclusively in Germany. Customer focus has become our corporate maxim. A team of more than 250 employees commits worldwide to offer our customers from the food and non-food sectors optimized, unique solutions tailored exactly to their requirements at all times. Sales, project planning and service are handled by the headquarters in Germany, by the four subsidiaries in France, the Netherlands, UK and the USA, and by a worldwide network of agents.

www.multipond.com

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VIBRANT NATURAL COLOURS FOR MEAT APPLICATIONS

Global meat production is projected to be 16% higher in 2025 than in the base period (2013-15). This compares with an increase of almost 20% in the previous decade. Developing countries are projected to account for the vast majority of the total increase, through more intensive use of protein meal in feed rations. Poultry meat is the primary driver of growth in total meat production in response to expanding global demand for this more affordable animal protein compared to red meats.

Processed meat is considered to be any meat which has been modified in order to improve its taste or to extend its shelf life. Innovative processing methods like salting, curing, fermentation, and smoking has resulted in manufacturers creating products that meet consumer demand for longer shelf life in meat and have a great visual appearance. Meat colour is significant to consumer acceptance of products hence natural food colours are used at various stages of the process to make it attractive, appealing, appetizing, and informative. The use of food colours in meat and poultry is globally increasing and is widely accepted amongst the millennials with more than 26000 products launched globally coloured using paprika, turmeric, annatto, beta carotene and redbeet. The most used natural colour in this category is paprika which gives a reddish orange shade to the final product.

While choosing the food for our appetite, colour plays a very significant

role. Addition of colour makes food more attractive and enhances its overall appeal. Over the past decade, manufacturers have started to switch from synthetic dyes such as FD&C's to natural alternatives including the processed meat category. Natural colours have in fact been used for centuries to colour food, beverages, textiles, medicine etc. When using natural colours in processed meat, technical challenges always exist. These challenges can include the cost in use; processing conditions, interaction with other ingredients,

and continued engagement with the category.

In addition to this, the regulation in various countries approves various naturally derived colourings in processed fish, meat & egg products. Due to this, Kancor's highly qualified research and development team tend to formulate products with paprika, turmeric, redbeet and annatto colours. Some colours like red beet and black carrot concentrates are considered dual purpose colours because these ingredients are added as a functional ingredient to the product in addition to providing colour to the finished product.

In processed poultry irrespective of the type of chicken part or portion, the respective food regulatory authorities permit the use of natural food colours on the surface of cooked poultry. Some common applications are breadings for nuggets or patties. Meat

and poultry processors prefer to use shades like yellow or reddish orange from annatto turmeric blends on the surface of cooked poultry to give it a more authentic and appealing look. Applications can be direct which include tandoori, barbeque, rotisserie or roasted. It can also be included to spice blocks, seasonings, marinades etc. Cutting edge extraction and manufacturing technology, which is becoming more environmentally respectful, is delivering processed foods in a more ethical way. Together with increased traceability and sustainability of natural ingredients, brands can



heat stability (undergo pasteurization (~ 80 deg C)), light stability and colour change in various pH values and interaction with oxygen.

As per Mintel's data, the world's top 20 retail processed meat and poultry markets accounted for an estimated 28.3m tonnes of volume in 2017, led by the US, Russia and China. Consumers are becoming increasingly concerned about the ethics and supply chain transparency surrounding meat, poultry and fish sourcing following several food scandals. This has put incredible pressure on suppliers to create trust

build honest product stories that inspire, reassure and delight.

Kancor and Mane offer C-CAPTURE, a wide range of natural colours suitable for various product platforms and systems. C-CAPTURE includes colours such as turmeric (yellow), a host of carotenoids including annatto, paprika and beta-carotene (yellow, orange and reddish orange), beet juice concentrate (pink), fruit and vegetable juices (red to purple) to name a few. In addition, the company offers spirulina (blue), several sodium copper chlorophyllin (green) options, caramel and other customised blends depending on, application, market location and desired hue. Kancor is a significant player in the extraction of natural raw materials. The company has been extracting and manufacturing natural colours since long. Kancor's expertise in in-house extraction, isolation, purification and blending processes, creates shades that are consistent in hue and stable in virtually any food and beverage matrix.

Kancor's colour stabilisation process is a synergistic play of carefully controlling the processing technology on one hand and the addition of an in-house functional ingredient OxiKan on the other. Kancor uses advanced controlled size technology that creates formulations without the addition of extra ingredients thereby minimizing the instability caused by these ingredients interacting with each other and with the food matrix thus making each product as label-friendly as possible.

While natural colours for meat applications do come with challenges

(no different than other food products) Kancor and Mane work to find the right solution. Based on the results of stability studies (such as the one below), Kancor and Mane have been able to uncover a variety of solutions to naturally colour meat-based products.

The following study compares between synthetic dyes (Sunset yellow & Carmoisine blend) with C-CAPTURE's Sunrise series.

Objective:

An application trial in Tandoori chicken comparing sample 1 (coloured using C CAPTURE Sunrise series-Annatto blend) and sample 2 (coloured using synthetic colour E110+E122)

1. To compare colour impartation between sample of C-CAPTURE's sunlight series and sample using synthetic colour in actual application.
2. To establish a dosage pattern for Tandoori application.
3. To check colour stability after grilling.

Formula - Tandoori Chicken

Sl. No.	INGREDIENTS	SAMPLE 1		SAMPLE 2	
		Weight	%	Weight	%
1	Chicken	190.50	81.96	155.42	81.94
2	Seasoning	7.62	3.28	6.22	3.28
3	Curd	28.6	12.30	23.22	12.30
4	Lemon juice	1.90	0.82	1.60	0.84
5	Ginger garlic paste	3.81	1.64	3.11	1.64
	TOTAL	232.43	100.00	189.67	100.00

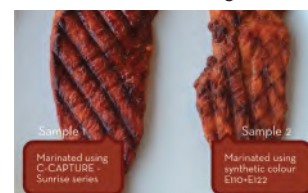
Formulation details - All colour samples were mixed with seasoning powder which was used to flavour the product. Dosage maintained in seasoning powder was 0.625%. This dosage will provide 250 ppm colour in the final product.

Observation:

Before Grilling



After Grilling



Conclusion

1. It is clear from the above pictures that the colours of both samples in marinated stage and after grilling were almost the same with sample 1, using C-CAPTURE giving a more orange appearance.
2. Dosage requirement for Tandoori application is 250 ppm in the final product.
3. Colour samples were found stable in grilling at about 120°C.

Procedure:

Two samples were made:
Sample 1: Coloured using C-CAPTURE Sunrise series, annatto blend
Sample 2: Coloured using synthetic colour E110+E122

After preparation, samples were compared in terms of end product colour visually.

The trial consisted of the following steps:

1. Preparation of seasoning powder with C-CAPTURE colour sample, spices, salt and other additives
2. Marinating and grilling of chicken
3. Evaluation and comparison

www.kancor.com

IFFA Hall 12.1, Stand D31

CAS ANESTHETIZATION: THE WAY OF THE FUTURE AROUND THE WORLD

The Popularity of Marel Poultry's CAS SmoothFlow is Rocketing Worldwide.

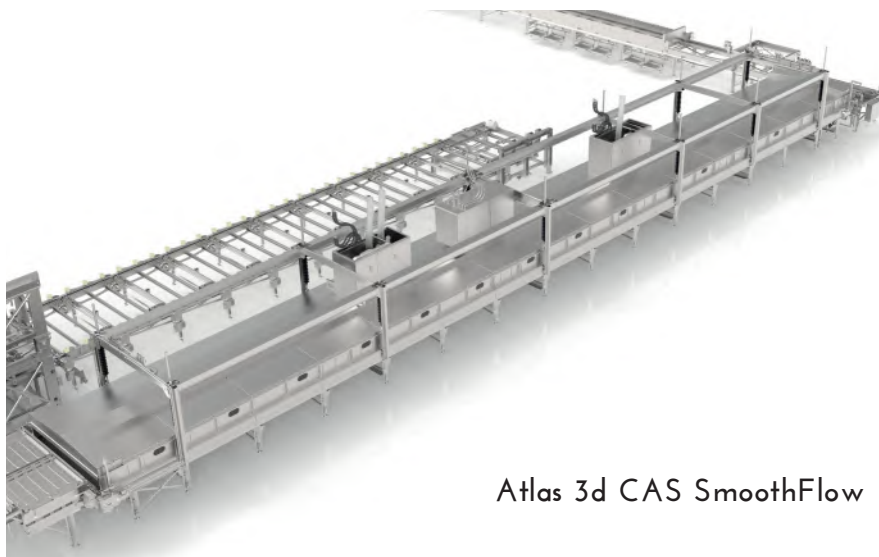
Globally, the interest in controlled atmosphere stunning (CAS) systems for poultry is growing, driven by multiple factors. Governmental legislation and consumer preferences concerning animal welfare are key considerations. Product quality, however, is also a main driver for choosing CAS. Marel Poultry was the first company to produce such an anesthetization system. At the moment, the popularity of the current generation CAS SmoothFlow system is rocketing worldwide.

There are two types of stunning systems commercially used for poultry, a water bath system and controlled atmosphere stunning. Worldwide, water bath stunning is the most used system, but it is losing ground.

Loss of Quality

Since 2013, EU legislation 1099/2009 has been in place. This legislation protects animals at the time of killing and describes in detail what and how

systems must be used for stunning and killing animals. For water bath stunning systems minimum currents (i.e. milliAmpères) per bird are determined to ensure loss of consciousness for all birds. These required currents, however, cause loss of meat quality. This (partly) explains why the majority of European processors has shifted or is shifting to controlled atmosphere stunning.



Atlas 3d CAS SmoothFlow

Legislation

In other parts of the world, legislation is gradually becoming stricter. In some countries this will lead to a faster switch to CAS stunning. We see this happening in the US, where the "Joint Animal Protection Organization Statement on Broiler Chicken Welfare Issues", a group including the US Humane Society and Compassion in World Farming, asks poultry companies to use CAS by 2024. The same year is marked as a deadline by the Global Animal Partnership organization for the broiler industry to have taken measures which significantly improve animal well-being. It is not without reason that several major US poultry processors recently decided to abandon electrical stunning and implement the CAS SmoothFlow system in their broiler processing plants.

The World's First

Tim van Schaik, product specialist live bird handling at Marel Poultry, tells about the world's first Controlled



CAS SmoothFlow Blauw

Atmosphere Stunning (CAS) system for poultry, which was produced by Marel Poultry. "Based on intensive research in the early nineties, we launched the first generation CAS stunning system in 1996. CAS SmoothFlow, our latest generation system, is the result of 30 years of research as well as customer and market experience."

Based On Science

"We have co-operated with numerous research institutes worldwide and the technology we apply is supported by dozens of scientific publications. Our CAS SmoothFlow system has a unique feature in the world of anesthetization: the regulated addition of O₂, next to CO₂. Tim van Schaik continues, "Based on scientific research, we found that a mixture of CO₂ and O₂ is the best way for broilers to get smoothly induced into unconsciousness."

The SmoothFlow system can consist of up to five equal sections, each with its own programmable controlled atmosphere. The broilers lapse gently into unconsciousness in the induction phase. Perfect control over the air mixtures in subsequent sections results in a smooth transfer to the completing phase.

"Birds lapse gently into unconsciousness, without any stress, pain or convulsions."

The Most Humane

Taking into account the entire process, including shackling, CAS is the most humane way of anesthetizing. "Certainly when the CAS SmoothFlow system is combined with the ATLAS live bird handling system, broilers can stay calmly in their trays all the way from the farm, during transport to the anesthetization area." Contrary to electrical stunning, broilers aren't shackled live; only after being stunned, they are shackled in an unconscious state, which is also less strenuous for



CAS SmoothFlow

the shackling team. Tim van Schaik adds, "Looking through windows along the entire tunnel, we can check the broilers' behavior during the inline stunning process. The new generation Marel Poultry systems stun the broilers within five minutes. We see that the birds go to sleep gently, without any stress, pain or convulsions. Atmosphere stunning results in an irreversible anesthesia."

Slowly

Once birds have been transported smoothly to the stunning system, they are exposed to less than 40% CO₂ for one minute. After that, the CO₂ level is slowly built up to a higher percentage. The improved product quality yield of CO₂ anesthesia, compared to water bath stunning, will be one of the main drivers for processors to switch to CAS.

First-In-First-Out

The CAS SmoothFlow system processes poultry according to the first-in-first-out principle. Van Schaik:



CAS SmoothFlow Window

"The continuous process assigns exactly the same stunning time and atmosphere level to every broiler. Another advantage of this linear setup is the possible removal of DOA's (birds dead on arrival) before they enter the stunning process." Certain countries have regulations that forbid DOA's from entering into the stunning device.

Decisive Arguments

According to Tim van Schaik, plenty of arguments are important when deciding to use CAS. "Many considerations have to be taken into account, such as animal well-being, food safety, regulations, hygiene, religious requirements and product quality. Additionally, atmosphere stunning systems have larger footprints than water bath stunning systems, so available space can also be a decisive aspect. Our customers choose the one or the other system with different priorities and needs in mind. It's our mission to advise the solution which best meets each individual situation."

www.marel.com/poultry

NEXT GENERATION CUTTING AND TRIMMING TOOLS WITH GREATER CAPACITY:

Bettcher's Optimised Quantum Flex Trimmer and Quantum Skinner Set New Standards



Picture:
Bettcher GmbH

Quantum Flex

High-performance cutting tools for the meat processing industry coupled with unique sales and service support - this is the recipe for success of Bettcher Industries Inc. The company, headquartered in Ohio, USA, achieves high customer loyalty through exceptional customer satisfaction. In Europe, the company is represented by Bettcher GmbH,

based in Dierikon, Switzerland, and is directly responsible for a growing number of markets.

Bettcher's showcase of innovative developments from its trimmer and skinner product lines will be the highlight of the forthcoming IFFA 2019 trade fair. The new tools enable the company's meat industry customers to further optimise production yield, and thereby increase throughput and profit.

With 75 years of experience in the industry, Bettcher promises to boost its customers' processes and profitability with a range of innovative trimmers and skimmers. To achieve this, the company develops tools that enable simple, clean and ergonomic work on meat production lines. This increases meat yield and leads to more profit in a highly competitive market. At the IFFA 2019, Bettcher will showcase its innovative portfolio at a new, larger

stand. Trade fair highlights will include the unveiling of all the latest features of its successful cutting tools.

Quantum Flex Trimmer - Fits Any Bettcher Motor

The new Quantum Flex Trimmer now offers maximum flexibility: it is compatible with any of the extremely durable Bettcher motors already used by Bettcher customers. Lighter weight and optimised ergonomic properties are also key features of the new Quantum Flex Trimmer. Its patented blade lock ensures that the blade stays in the same position and thus guarantees ease of use. Lower vibration leads to greater comfort when working and reduces wear and tear of blade and housing. Further technical adjustments provide increased blade speed and better cutting efficiency. This translates to significantly higher meat yields and a speedy return on investment.



Picture:
Bettcher GmbH

Effective Trimming and higher meat yields, with Quantum Flex



Picture:
Bettcher GmbH

Motors - The Quantum Flex fits any Bettcher motor installation - no need to replace existing motor

Quantum Skinner - Electrically Powered

The latest generation of Quantum Skinner by Bettcher was launched in Europe in 2018. As the first electrically powered hand-held skinner, it clearly stands out from other devices which normally require compressed air to operate. Its Quantum Motor not only provides high-speed power and performance but is also exceptionally quiet. Another advantage is the skinner's significantly reduced weight, making it easy to handle. At IFFA 2019 Bettcher will present an upgrade with technical optimisations that include more torque and therefore more power to facilitate the meat cutting process.

Bettcher has launched another innovation to offer customers even more flexibility: both the Quantum Skinner and the Quantum Flex Trimmer can now be used with the new motor, so that only the handpiece needs to be changed in order to switch applications. This not only saves time in production, but also provides energy savings of up to 90 percent compared to pneumatic devices.



Picture:
Bettcher GmbH

Gregor Thomalla -
Managing Director Bettcher GmbH

Careful Product Development, Advanced Tools, Comprehensive Service

Bettcher's development, manufacturing and purchasing units are headquartered in Birmingham, Ohio. The Bettcher Innovation Center, BIC, is an innovative research facility where next generation products are developed. It includes a state-of-the-art testing facility where new products are subjected to rigorous testing under real-life conditions. Bettcher ensures that only sophisticated tools are released to market. Apart from its European Head Office in Switzerland, the company also has offices in China and Brazil. These locations serve markets in Europe, the Middle East, Africa and Asia. In part, this is done through local distributors, some of whom look back on decades of partnership with Bettcher. However, when one of these partners leaves the Bettcher network, Bettcher now opts increasingly for direct sales - another success story for the company.

At the centre of the Bettcher sales concept are designated Bettcher experts. These consultants are experienced practitioners, e.g. butchers, who have local expertise of their markets. This includes specialised knowledge of country-specific applications and meat cutting processes. Due to their proximity to customers, Bettcher experts offer targeted on-site support such as free-of-charge training for new employees handling Bettcher tools on processing lines. For Bettcher, the initial outlay is rewarded by high levels of customer satisfaction. Another of the company's strengths is short response times. For this purpose, existing capacity has been greatly expanded to ensure, amongst other things, short delivery times for spare parts.

Bettcher - Future Growth and Portfolio Expansion

The move to provide direct sales in various regions of the world has

brought the company strong growth. In recent times, Bettcher has celebrated the successful launch of innovative new products. The high level of investment in improved services and support is also paying off.

Picture:
Bettcher GmbH



Quantum Flex unique quick-change blade house with cam mechanism

The company is expanding and intends to broaden its range of services and products with high-performing additions. The US subsidiary Gainco from Gainesville, Georgia, has for example launched the YieldScan, an innovative scanner that offers precise yield monitoring in the poultry industry. During the production process, the YieldScan performs real-time monitoring that analyses the amount of meat remaining on the bones. If too much meat remains, corrections can be undertaken immediately. The scanner therefore perfectly complements Bettcher's portfolio for the poultry industry which also utilises the innovative blades from Bettcher's range of cutting tools.

The latest addition to Bettcher's portfolio is Exsurco Medical of Wakeman, Ohio, located near Bettcher's headquarters. Exsurco develops and produces blades for healthcare and surgical applications.

Thus, Bettcher is well positioned to meet all current and future challenges.

www.bettcher.com

IFFA Hall 8.0, Stand A30

GOOD ANIMAL HANDLING BEFORE SLAUGHTER IS ALSO GOOD BUSINESS

By Dorte Lene Schrøder-Petersen

Now, animal welfare standards can be measured and calibrated for maximum efficiency. The Welfare and Quality Check (WQC) is a perfect tool for surveillance, benchmarking and communication of your animal welfare.

Increasing Focus on Improving Animal Welfare at the Slaughterhouse

The majority of the earth's population eat meat from animals that are bred and slaughtered under industrialized conditions. The farmers, haulers and the meat industry are responsible for ensuring that the animals are treated well and without unnecessary use of force. Within the EU, and in many other parts of the world, animal welfare at the time of slaughter is regulated by law. At the same time there is growing public pressure in many countries to optimize animal welfare, including at the day of slaughter.

Animal welfare is not just about ethics and humanity, it is also about common sense and good economy. DMRI have experienced that handling

the animals in a gentle way before slaughter not only leads to good animal welfare, but also to good business – primarily because the quality of the meat is better from animals that are not stressed due to lower drip loss and less variation in pH, for example. In addition, gentle treatment also results in fewer injuries to the animals and survival of more animals until the time of slaughter – which reduces food waste.

It is Always Relevant to Optimize Animal Welfare – Even at Well-Run Slaughterhouses

It will often be possible to improve animal handling, or procedures related to the live animals, even in well-run plants. New operators, old layout or machinery – there is always a good reason for re-focusing on how the live animals are being handled. Some of the typical problems that indicate the need to renew the focus on animal welfare are a slow flow in production, increased need for trimming and increased drip loss. Very often these issues are just accepted as unsolvable problems.

The Areas In Production that Can Often be Optimized are as Follows:

• Pick-up facility

A well-designed pick-up facility can reduce the amount of fighting among the pigs, thereby reducing the degree of skin damage. Furthermore, in a well-designed facility, the pigs are encouraged to walk more voluntarily to the truck, thus reducing the time used to load the truck.

• Transport

A well-designed vehicle with good ventilation can reduce the number of animals dying during transport and in the lairage. Furthermore, an optimal logistic planning system can help minimize the stress during loading, and increase the meat quality measured by pH and drip loss.

• Unloading

Regarding unloading, it is important to optimize the design so that the pigs do not get frightened by external stimuli such as reflections and noises, therefore, voluntarily walking to the lairage. This facilitates the unloading process, reduces the amount of labour and optimizes the working conditions.

• Lairage

During lairage, the pigs should be kept in small groups. Dividing big lairage pens into smaller units (approx. 15 pigs per unit) will reduce fighting, since the pigs do not need to constantly re-establish their hierarchy. Research has shown that pigs in small groups are more relaxed after a 10-15 min period. This is beneficial due to the reduced amount of skin damage, which again reduces the amount of necessary trimming and probably optimizes the meat quality due to the decrease in drip loss.





In WQC, the slaughterhouse will not only have an audit and receive a diploma, it will also receive an action plan based on the problem areas, which DTI identify at the visits.

- *The race*

In the race leading to the stunner, small groups are also easier to handle, and it is therefore easier to get the pigs to walk voluntarily. The number of pigs that fall is reduced, and this can reduce the amount of haemorrhages in the tenderloins and the hams.

- *Stunning*

An optimal stunning procedure is needed to avoid stress and negative reactions among the animals. Furthermore, the amount of haemorrhage, especially in the hams, can be reduced. A reduced amount of haemorrhages will minimize the need for trimming, thereby improving the economy of the slaughterhouses.

Good Animal Handling Can Be Learned

DMRI educate and train slaughterhouse operators/managers around the

world in correct animal handling. The course consists of a one-day survey of the current handling of animals by the operators and the mechanical functions at the plant. This is done to obtain insight, which will be used for the subsequent education and training. During a weekend, for example, all operators and managers working at the slaughterhouse (from reception to sticking) will be given a course in the correct handling of pigs. Managers will undertake the course on day 2, and operators on day 3. The course is finalized with a test, and operators/managers passing the test will be given a diploma, which specifies that they are now educated by DMRI in the live handling of pigs.

Welfare and Quality Check (WQC) is an audit system that improves both animal welfare and meat quality at the same time

When DMRI visit a slaughterhouse with the purpose of performing a WQC, the slaughterhouse will be surveyed by DMRI experts. The slaughterhouse staff will be educated in WQC both theoretically and practically in the production. At the same time, DMRI experts perform a WQC in order to set a zero-point level. At the end of the visit, a customized follow up plan will be agreed with the slaughterhouse management. The follow up plan will typically consist of re-visits, skype meetings, perhaps followed by video and photo documentation, or a combination of the above. Follow up is optional – but recommended – in order to secure

the longevity and significance of the program.

In WQC, the slaughterhouse will not only receive an audit and diploma, it will also receive an action plan based on the problem areas identified by DMRI at the time of the visits. The action plan includes suggestions on how to handle such issues. The problems are discussed regularly at meetings between the slaughterhouse and DMRI according to the agreed follow up plan. The slaughterhouse will have the opportunity to contact DMRI with questions (e.g. photo, video recordings) anytime needed, within the agreed follow up period.

The WQC graduation is divided into 4 main sections: unloading area, lairage area and driving to stunning, stunning and sticking process, and meat quality. Each section is divided into subsections, and the evaluation of each subsection is divided into a number of individual questions/surveillance points.

What is so special about WQC? Our philosophy is not only based on management, slaughterhouse layout and animal-based indicators, but also on meat quality. WQC thereby gives the slaughterhouse a tool to



In a world where there is a growing consciousness about animal welfare and sustainability, there is a constant need for focus on and re-thinking of the way we handle our animals.

optimize production economy – as well as improving animal welfare at the same time.

'In a world where there is a growing consciousness about animal welfare and sustainability, there is a constant need to focus and re-think the way we handle our animals. One way to secure compliance with legislation and consumer demands is to continuously educate the staff and implement



valid monitoring procedures'. (Dorte Schrøder-Petersen, DMRI)

About the author:

Dorte Lene Schrøder-Petersen is the team manager for animal welfare at the Danish Technological Institute (DTI/DMRI). She is a veterinarian and holds a Ph.D in Ethiology (animal behaviour).

Before she came to DMRI she was employed for 14 years in The Ministry of Environment and Food of Denmark.
www.dti.dk/dmri

TACKLING ANTIMICROBIAL RESISTANCE THROUGH IMPROVED LIVESTOCK HEALTH AND WELFARE

Launch Of An Exciting EU - China Research Project

A new ambitious and ground-breaking project was launched: HealthyLivestock. Internationally renowned experts and scientists from the European Union and China will work together to tackle antimicrobial resistance (AMR). A key pillar of the project is disease prevention. Combined with prompt and targeted interventions where necessary, this will result in a reduced use of antimicrobials and less AMR: a clear win-win for animals and people.

Medicines against infectious diseases, called antimicrobials, are one of the most valuable inventions in human history. Since their discovery, antimicrobials have saved the lives of millions of people and animals. However, every antimicrobial use inevitably promotes the emergence of defense mechanisms by the disease agent.

HealthyLivestock has chosen to tackle antimicrobial resistance at its roots and covers the species of pigs and poultry.

Through a Multidisciplinary Approach it Will Lead to:

- reduction of the risk for animals to get exposed to disease agents,
- increased resilience of the animals towards disease challenges,
- early detection of health problems and specific diseases,
- and if antimicrobials are needed, a more precise use or alternatives.

Special tools to help farmers will be developed. The outcome of HealthyLivestock research will be conveyed to all relevant parties, including farmers, quality assurance scheme owners, and veterinarians working in livestock production, as well as animal welfare organizations, politicians, and decision makers.

GLOBALG.A.P. is part of the consortium and look forward to integrating practical outcomes of the research project into

our certification standards. In turn, the requirements and strategies put forward by the GLOBALG.A.P. IFA Standard regarding biosecurity, animal welfare, and antibiotic reduction strategies in the livestock provide a good foundation for HealthyLivestock. Our experience in quality assurance and in communicating and promoting improved biosecurity, antibiotic reduction strategies, and the avoidance of antimicrobial resistance at producer level are a major contribution to the project.

HealthyLivestock is coordinated by Wageningen Research. The project will last 4 years and integrates partners from academia, research institutes, and the private sector from the following countries: Belgium, China, France, Germany, Italy, the Netherlands, Poland and the United Kingdom. The consortium is funded by the European Commission and the Chinese Ministry of Science and Technology.

www.globalgap.org



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X-RAY FLEXIBILITY GUARANTEES HIGHEST QUALITY STANDARDS

Two Ishida IX-GA 4075 x-ray inspection systems are supporting Scandinavia's number one supplier of reindeer, venison and elk meat in its ability to meet the very highest food standards including ISO 22000 FSSC (Food Safety System Certification).

The Polarica factory in Rovaniemi, Northern Finland slaughters up to 20,000 reindeers and butchers 1,200 tonnes of reindeer and game meat per annum, supplying both fresh and frozen meat for the retail and foodservice sectors, along with around 2,200 tonnes of processed meat including reindeer and game, salami and ham.

The fresh and frozen meat is weighed and packed into a wide variety of bag sizes from 30g to 2.5kg. Because elks are hunted, a particular quality check requirement for the elk meat is to detect any shot remaining after cut up. While a metal detector would also be suitable for this purpose, plant manager Kalle Huhtamella says that the Ishida x-ray systems provide a much higher level of sensitivity as well as the ability to detect a wider range of foreign bodies.

"The water content in fresh meat is a particular challenge for metal detectors," he explains. "The fluid resonates in the detector's magnetic field and this can signal the presence of a foreign object to the machine. The metal detector therefore has to be calibrated to remove this problem, but this also reduces its overall detection effectiveness."

"X-ray systems are not affected by this and at the same time are also able to detect other potential foreign objects such as glass, dense plastic, and bone. This additional versatility is of huge benefit in helping us to

meet the stringent quality standards of our customers."

A second Ishida IX-GA-4075 is inspecting sealed packs of sliced processed meat in pack sizes from 80g to 600g.

"The Ishida x-ray provides the perfect final quality check for the finished packs," says Kalle. "We are able to screen for any foreign bodies from the raw material used in the manufacture of these products, and for any other objects in the unlikely event that they accidentally find their way into the packs during the processing and packing operation."

The IX-GA x-ray inspection systems incorporate Ishida's unique self-learning Genetic Algorithm (GA) technology that provides maximum detection sensitivity and reliability, and are more than capable of handling the different speeds and pack sizes on the two lines. The machines are in operation for eight hour shifts, five days a week, are easy to use and extremely reliable.

"The Ishida x-ray systems are our models of choice," confirms Kalle. "They are simple to calibrate and work continuously and reliably. We require the utmost accuracy and consistency in our inspection systems as quality is fundamental to our reputation, and this is the reassurance we get from the Ishida models. This may involve a more expensive initial investment but for us, it has definitely been worth the money."

One example of the superb detection capabilities of the Ishida x-ray was its ability to spot a very small piece of shot of around 0.2mm in a piece of reindeer tongue. This is a highly unusual occurrence and seems likely to have been caused by the reindeer



ingesting the shot when grazing and this small piece travelling through its veins until it came to rest in the tongue.

"Without the Ishida system we simply would not have been able to detect this," says Kalle.

Polarica's long-standing experience of Ishida technology also includes the installation of one of the company's multihead weighers for its fresh meat line. The current 14 head model replaced a 10 head variant which had been operating successfully for over 15 years.

"Our original weigher was fast and extremely accurate but the additional heads on this latest model have given us even greater weighing capacity, which is particularly vital as we are introducing some smaller 30g, 40g and 50g retail packs of meat," says Kalle. "The weigher is continuing to deliver high levels of accuracy at very fast speeds."

The Ishida x-ray systems were supplied by the company's Finnish agent, Multivac Oy.

www.ishidaeurope.com



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SCHUR FLEXIBLES GROUP PRESENTS NEW SCOPE OF POSSIBILITIES AND INNOVATIVE AND SUSTAINABLE PACKAGING SOLUTIONS AT PACKAGING INNOVATIONS 2019

To strengthen their center of excellence concept the Schur Flexibles Group has acquired Uni Packaging UK in April 2018. With them the Group is the perfect partner for all flexible packaging matters for a wide range of clients' product portfolios. The Schur Flexibles Group has already developed a pioneering sustainability strategy under the guiding principle of "rethink" and will welcome visitors at Packaging Innovations in Birmingham from February 27th-28th, stand D40, to share their ideas and information on new packaging regulations while presenting their innovative sustainable packaging solutions.

Schur Flexibles' Five Pillars of Sustainability

The implementation of the sustainability strategy follows Schur Flexibles' recently developed 5R programme based on five pillars: responsibility, recycling, replace, reduction and renewal:

- **Responsibility:** Schur Flexibles takes full responsibility for itself and its products. The company has implemented a wide range of measures to support sustainability within the Group and its sphere of activities.

- **Recycling:** Schur Flexibles aims to maximise the recycling of reusable materials in order to reduce the use of new materials e.g. with the award winning FlexiClose(re) based on polyolefines or BarrierTop(re) based on PET.

- **Replace:** Packaging solutions that are not optimal from a sustainability point of view will be replaced by more

sustainable alternatives, one of the options are the Standup Pouches.

- **Reduction:** The amount of materials used will be reduced as much as possible to save resources. The range of innovative and high performing products includes the VACUshrink FM40 film and BarrierTop X 35 which are amongst the thinnest on the market.

- **Renewal:** Wherever possible, alternative packaging materials made wholly or in part from renewable materials such as paper, fibre, or plastic films from renewable raw materials will be used, e.g. DanaFibre.

The packaging solutions developed as a part of Schur Flexibles' 5R approach and "design for recycling" concept, are all marked accordingly with the "rethink" logo to highlight the range of sustainable products. The most important prerequisite for the market launch of all sustainable packaging materials is that they fulfil the highest levels of product safety and functionality.



Photo: Schur Flexibles Group

FlexiClose (re): Winner of German Packaging Gold Award and Sustainability Award 2018



Photo: Schur Flexibles Group

Picture 2: Schur Flexibles BarrierTop X 35 for MAP applications: At 35µ thickness it is currently the thinnest film available in the market. It has outstanding tear resistance and excellent machinability.

Sustainable Packaging Enhances Point-of-Sale Advantages

Utilising the modern, flexible and resource-saving packaging solutions offered by Schur Flexibles not only protects the environment but also ensures a competitive advantage at the point of sale. Sustainability is a criterion that increasingly influences consumers when they decide whether to buy a product or not. Therefore, the ability to advertise products by highlighting the sustainability of their packaging leads to significant market advantages.

A Strong Partnership to Serve Customers Best

With the acquisition of UNI Packaging UK, the Schur Flexibles Group has expanded their already comprehensive portfolio of flexible packaging solutions, now covering the entire value chain: extrusion technologies, including modern Waterquench coextrusion, laminating and coating with or without solvents, all standard printing technologies are available for flexible packaging including digital printing and converting with

modern and convenient extras such as laser perforation. This one stop shop concept with production sites and sales contacts all across Europe is completed by services that go

beyond the daily business, such as those offered by the PackScience Center - a combination of a modern pilot plant with expert support and a comprehensive choice of seminars. In

addition, customers can receive the relevant technical support to ensure a smoothly run packaging process of their production lines.

www.schurflexibles.com

BARRIER VERSIONS OF PLASTIC-FREE EARTHPOUCH HIT THE SHELVES



EarthPouches

BARRIER versions of Sirane's award-winning plastic-free packaging solution are now available - with options including stand-up pouch, bag and flow-wrap film.

Sirane's plastic-free packaging 'Earthpouch' won a top prize at the UK Packaging Awards - taking first place in the Resource Efficient Pack of the Year category.

And barrier and high barrier versions are now available - as Sirane's Earth Packaging range continues to expand. The barrier and high-barrier versions potentially allow the plastic-free solution to be used for meat and fish products, including frozen.

Simon Balderson, Sirane MD, said: "Earthpouch is a great product, a paper-based packaging solution with a natural coating that makes it entirely plastic-free.

"The barrier version - and the high-barrier version which has just been released - were the obvious next steps, allowing more sectors of the market and packers of different products to use an environmentally-friendly packaging solution."

The Earthpouch - an industry first - is made from a paper with a 100% plastic-free heat-sealable coating which is then formed into a preformed stand-up pouch which provides total food security for dry and moist food products. The material is now also available as a bag and as a flow-wrap film with the same properties.

Judges at October's UK Packaging Awards described the Earthpouch as an "Innovative pack that will deliver the single material to simplify the recycling stream or be composted, with many pouches now on the market and a trend for reusable and therefore refillable this is a welcome addition as a pack format option."

Simon Balderson added: "One of the great things about the Earthpouch is that it is also cost-effective, often environmentally-friendly packaging comes at a cost, with Earthpouch that's not the case, there really are no negatives.

"We know customers have different requirements in terms of barriers, depending on what they are packing, and we're working on having a solution for everyone."

One of the common questions with pouches like the Earthpouch is 'how to we pack it?' We've also recently added a pouch-filling line to our offering, the M7, which is compatible with the Earthpouch as well as a range of other materials.

The Earthpouch is just one of a range of compostable/recyclable products and packaging solutions Sirane has developed over the years - and it has been placed in our Earth Packaging range: compostable; recyclable and sustainable.

As well as a range of compostable absorbent pads, we've also added a range of paper-based absorbent pads which are both compostable and recyclable. Pads can form a key component in meat packaging, improving appearance & shelf-life.

The UK Packaging Awards success comes on the back of a great few months, in which the plastic-free packaging has earned serious industry recognition.

The Earthpouch was recognised last year at the Sustainable Food Awards in Amsterdam, where it finished third in the sustainable packaging category.

And we were also awarded a Green Apple Environment Award for Environmental Best Practice - which was presented at the House of Parliament on November 12.

Sirane is an innovative food packaging development-to-manufacture company, with expertise in absorbency and material science. Specialisms include bags and pouches, absorbent products, shelf-life extension and dual-ovenable products.

www.sirane.com

TASTIER, FRESHER, LONGER SHELF LIFE AND MORE SUSTAINABLE: THAT'S MICVAC'S PROMISE

Micvac will be exhibiting at the CFIA in Rennes from March 12 to 14, 2019 and will present the Micvac system for the production of innovative and sustainable fresh, chilled ready meals.

As a pioneering food tech company, Micvac contributes to a more sustainable society through their innovative system for healthy and environmentally conscious meals. The company has developed a chilled ready meal system that utilises in-pack cooking and pasteurisation in one continuous process. Key to this process are the Micvac microwave tunnel as well as Micvac's patented packaging components: the Micvac valve, tray and specially designed film.

Micvac has just received the SACCN Y - Deloitte Green Award* for their system for the production of fresh, chilled ready meals:

« Micvac has created a great contribution to decreasing the amount of synthetic preservatives being used in ready meals, as well as prolonging their shelf life, leading to a healthier and more sustainable environment.» In the fresh convenience meal segment the Micvac

system enables shelf life of up to sixty days without preservatives, compared to the typical five-day shelf life for many other chilled ready meals. This extended shelf life reduces spoilage in stores and at home while at the same time keeping food fresh and tasty, while also adding to convenience with the signature Micvac whistling sound: when heated in the Microwave the package signals when the food is ready to be enjoyed. The system maximises energy efficiency right from the word go. Micvac offers important energy savings through a variety of features. The improved microwave tunnel only heats up when products are inside. The cooking process is highly targeted, which means that only the products passing through the 3-lane microwave tunnel are heated. Fast in-tray microwave cooking means that cooking times are kept to a minimum, thus preserving not only energy but also the flavour, texture, natural colouring and vitamins of individual ingredients. Also, there are fewer pre-cooking steps needed.

A recent study with KIN Food Institute, Neumuenster, Germany collected data looking at the conventionally offered



Photo: Micvac AB

Christian Benedict,
Country Manager France

convenience meals, comparing the conventional autoclave process with the Micvac microwave system. The results made clear, that the Micvac process is much more sustainable - 1/4 of the CO2 emission - and also cheaper - 1/3 of the operating costs per tray and the 1/2 the production time. When comparing the vitamin content of the same recipe, Goulasch with potatoes and red peppers, after cooking the vitamin content of the Micvac fresh chilled ready meal was almost as twice as high as the other.

For the French chilled ready meal market, which was valued at €484.85 million at the end of 2016 (Source: IRI) the Micvac system gives producers the opportunity to outperform their competitors with all the advantages of this modern technology (According to InnovaDatabase, the number of new chilled ready meal launches in France raised by 16.5 % between 2015 and 2018). Other findings show, that for French consumers the most important property of a ready meal is the convenience aspect.

All in all, with this modern approach and by offering meals that are fresh, full of flavour and healthy, Micvac fulfills the wishes and tastes of the modern consumer in these fast-moving times.

www.micvac.com



Photo: Micvac AB

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“TRIALS WILL HELP INDUSTRY TO SAFELY REDUCE PACKAGING WASTE” SAYS ULMA PACKAGING UK

The packaging industry must keep an open mind and invest in sustainable ways to reduce materials waste, but it will be an ongoing process - says an industry spokesperson.

Paul McMahon, Business Manager - Machine Sales at ULMA Packaging UK, says: “Growing concerns over plastic pollution and the impact of food packaging waste on the environment is helping to increase demand for sustainable packaging. While the current sustainability drive is welcome news for policy makers in the UK tackling the impact of plastics and ways to boost recycling - it will take time for manufacturers to find suitable alternatives.”

Paul, who believes that trials with any new packaging will need to happen to ensure that the quality and protection of food is assured, explains: “The good news is that innovative packaging machinery

designed to reduce pack size and waste, in addition to being compatible with biodegradable and recyclable materials, is helping to make waste reduction a reality.”



Paul, continues: “Machinery designed to reduce film waste by up to 40 per cent such as ULMA’s TFS407R, alongside innovative materials like biopolymers and other solutions such as paper-based wrappers and boxes

continue to be introduced to the market and we expect this trend to continue.”

ULMA Packaging UK acknowledges that reducing food packaging waste is a top priority and is currently working closely with several industry partners to run trials using sustainable materials including cardboard, as well as compostable and recyclable films.

Paul, concludes: “We have recently invested in a new demonstration facility in the UK to facilitate packaging trials as it is important for us to help brands achieve their goals. By trialling new packaging machinery with sustainable materials, any concerns over whether an innovative new material will do the job it needs to do is alleviated. It truly is an exciting time to be working in the packaging sector and the amount of bespoke packaging solutions on offer to reduce waste is astounding.”

www.ulmapackaging.co.uk

COMPLETE SOLUTIONS FROM A SINGLE SOURCE

MULTIVAC will be presenting holistic solutions for processing and packaging meat and sausage products to trade visitors from industry, craft and trade. In addition, concepts for production of sustainable packaging solutions and the topic of digitalisation will be among the focal points of the trade fair. The appearance will be rounded out with the presentation of the extensive product range in the area of labelling and quality in-spection.

MULTIVAC’s trade fair appearance will be under the slogan of “The DNA

of Better Packaging and Processing”. One focus will be the presentation of complete solutions for cutting and packaging of meat and sausage products. MULTIVAC’s expertise in the area of cutting and portioning, as well as various solutions for efficient connection of cutting systems to downstream packaging machines, will be presented on the basis of several fully automated lines. Particular attention is paid to efficient and gentle transfer

of the cut products into the respective pack cavity, for which MULTIVAC



offers various pioneering solutions. In addition, solutions for pack marking,

inspection, converging and packing in boxes are integrated into the lines.

MULTIVAC also expects a high level of visitor interest in the area of sustainable packaging solutions. A wide variety of concepts that contribute to reducing packaging material consumption in packaging production, as well as concepts for production of packaging that meet current requirements with regard to recyclability, will be on display. One example of this is the MULTIVAC PaperBoard portfolio, which is made up of a wide variety of materials for the production of MAP and vacuum skin packs on thermoforming packaging machines and traysealers.



MULTIVAC will demonstrate MultiFresh™ technology for production of vacuum skin packaging on a compact thermoforming packaging machine and a compact traysealer, which is also equipped with a labelling system for applying promotional labels to the pack.

In addition, an extensive product range in the area of labelling and quality inspection will be presented. The most important exhibits include direct printing systems and solutions for efficient wrap-around labelling of a wide variety of packs, which MULTIVAC has consolidated under the brand name Full Wrap Labelling.

At an additional stand in Hall 12, MULTIVAC will be exhibiting a wide selection of compact chamber machines for craft businesses. Live demonstrations of the latest slicers

and portioners will take place in the MULTIVAC Processing Tent in front of Hall 11.



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www.multivac.com
Hall 11, Stand B11, C11, D11
Hall 12, Stand C40

PROSEAL GT1s GIVES ONE HECK OF A BOOST TO SAUSAGE-MAKER

The high speed and low maintenance of three Proseal GT1s tray sealers are providing Heck Foods Ltd with increased efficiency in its factory operations as well as better quality packaging for its sausage and burger products. The tray sealers deliver a fast and reliable sealing operation, running for 12 hours a day and at a speed of around 60 packs per minute.

The top sealed trays have replaced Heck Foods' previous shrink-wrapped packaging, ensuring the company's products are now better protected, more effectively presented, and more convenient for both retailers and customers. Top sealed trays offer a stronger pack format than shrink wrap, providing additional protection by being fully, hermetically sealed and ensuring the products are displayed to their best advantage by using a stretch film that also allows vertical display.

"The three Proseal tray sealers are very reliable and their seals are

quality," comments Andrew Keeble at Heck Foods. "They've massively improved our operation by optimising our run rates – no surprise as we've bought Proseal machines in the past and know their good reputation is justified."

The GT1s machines are installed on three lines in the Heck Foods factory, with two machines packing sausages and one packing burgers. Proseal's ProMotion system maximises throughput with its following motion and intelligent buffering technology that enables trays to feed continuously into the sealer without stopping. The machine's I-Film technology meanwhile ensures effective monitoring of the film diameter for high-speed printing.

Particularly important for food markets such as sausages and burgers, Proseal's unique Eseal® technology provides high quality seal reliability. At the same time, it delivers a 92% reduction in energy usage, which offers valuable cost savings and sustainability benefits.

Heck's operations are further enhanced by Proseal's 'Auto Tool'



connection system, which enables tool changes to be carried out in around two minutes. Quick-change conveyor belts and an auto-lock film reel holder also reduce downtime.

"Maximising throughput is vital to the efficiency of our operation and the Proseal machines are helping us to achieve this," concludes Andrew Keeble. "On top of everything else, the aftersales support we have received from Proseal has been the best of anyone we work with."

"We are also looking at different pack formats, and Proseal are working with our tray manufacturers on this."

Based in Kirklington in North Yorkshire, Heck Foods is run by the Keebles family and has now passed down to the family's second generation. The independent company prides itself on delivering farmers' market quality sausages to a wider market.

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HOW EUROPEAN POLICYMAKERS CAN CREATE A CIRCULAR ECONOMY

There has been a seismic shift in public attitudes to waste and recycling recently, and policymakers have been implementing ambitious targets and new regulation all over the world. The European Union is no exception, having announced a series of new laws that will undoubtedly change the way EU Member States recycle and view waste in the future.

At the root of this new legislation is the circular economy and the EU's desire to manage its own resources more effectively, further fueled by restrictions put in place by countries that traditionally accepted the EU's waste.

TOMRA Collection Solutions, the world leader in reverse vending, is present in more than 60 markets worldwide working to create a more circular economy. The Norwegian company collects 35 billion used

beverage containers per year within deposit return schemes for closed loop recycling.

Here, TOMRA Collection Solutions sets out how a circular economy can be accomplished through more recycling and material recovery, and how viewing plastic as a valuable resource instead of waste is one of the first steps in achieving this.

Waste Crackdowns

The EU currently recycles only about a quarter of the 25-26 million tons of the plastic waste it produces annually, and about half of that was sent to China. However, when China's National Sword policy was introduced in February 2018, 24 types of waste material were banned and the purity level required for accepted items greatly increased.

The world's reliance on China as a depot for presorted but dirty waste has been thrown into sharp focus, and with an influx of materials being diverted from China, other waste-importing countries are following suit with their own restrictions. In August, Thailand banned the import of plastic and electronic waste. Then, in October, Malaysia's hugely strained recycling industry – which was inundated with 88,000 tons of the UK's plastic scrap and 150,000 tons from the US – announced similar restrictions on plastics imports.

As countries close their borders to poor quality recyclables, Europe's waste-exporting countries are planning how they are going to manage the tidal wave of rubbish they traditionally exported and are looking inwards to improve their own recycling infrastructure.



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*easily sorted and recycled where the right infrastructure is in place

New Eu Recycling Targets

Through the Circular Economy Package, EU Member States have signed up to a number of legislative proposals on waste, including a 75% target recycling rate on packaging waste by 2030. Additionally, in October, the European Commission announced that not only would plastic drinking bottles have to include a minimum of 35% recycled content by 2025, but also that Member States must collect and recycle 90% of these beverage containers.

In addition to China's waste import ban, the catalyst for this legislation has been heightened awareness of an increasing environmental pollution crisis. Implementing these ambitious targets will bring many benefits and by managing resources more efficiently, EU countries will create green jobs,

manufacture higher quality products and deliver a more sustainable and circular model of production.

Circular Economy Explained

While many governments are realizing that a linear industrial model is no longer sustainable and are increasingly willing to take action, a circular economy can seem like an intangible or distant goal.

But a circular economy would have wide-ranging benefits and can be introduced very practically, says TOMRA's circular economy advisor, Kristine M. Berg: "The circular economy is all about the positive environmental impacts of keeping resources in closed loops. This includes the direct benefits of recycling such as reducing carbon emissions, but I would argue that it also covers much wider benefits of

reducing demand for virgin materials and triggering improvements in consumer behavior."

Berg also highlights important distinctions in how climate and environment are understood with a circular economy perspective, both by government and consumers: "A circular economy mindset is a key solution when talking about environmental issues such as marine litter, because in a sense you eliminate the idea of 'waste'. Everything is a resource. Materials are ideally designed for recycling, for a second, third, fourth lifecycle – and are collected and recycled accordingly to maintain material quality. This is true for glass bottles, metal cans and plastic bottles, for example."

"But not all of these perform equally well if we talk about climate on top

of this. Plenty of other materials can be recycled to a high quality over and over again – but collection and recycling can be very energy intensive. Although much harm can come from plastic materials when they go astray and end up in the environment, plastic outperforms most other materials in terms of climate gains or benefits in the recycling process. Furthermore, plastic can't be easily replaced in terms of medical equipment, transport, or food and water safety. Plastic isn't the enemy, our single-use behavior is.

"Waste management systems are extremely complex and value chains can be very intricate. Co-operation and transparency are key; when thinking about the execution of EU-wide regulation there needs to be thoughtful implementation."

Regulation Must Support Recycling

With increasing awareness of the impact plastic has on the environment, regulators have an important role to play in maintaining the reputation of the material. Plastic is the workhorse material of today's economy and, for manufacturers, it brings unrivalled functionality at low cost.

However, there are signs that European legislators are considering reclassifying plastic as 'hazardous waste', following a proposal discussed at the Basel Convention in September. While the intentions behind the recommendation may be good, TOMRA suggests that restrictive policies would make recycling and thus recycled products more expensive and complicated.

Head of TOMRA Collection Solutions, Harald Henriksen, says: "With advanced sensor-based sorting technology available, there is no need to burn plastic waste for energy recovery instead of recycling it into new products. In fact, burning plastic waste is the very definition of

a linear economy, and what legislators are trying to overcome.

"Taking a waste-to-energy approach doesn't encourage better product design and consumer behavior. Worst of all, burning plastic means that we need to pump up more oil for more products, when we have already produced 8.3 billion tons of plastic since the 1950s."

For Henriksen, the EU's focus for a circular economy should be on reducing demand for, and reliance on, virgin plastic.

From Waste to Value

Central to the vision of a circular economy shared by policymakers, industry and technology providers like TOMRA, is the reimagining of plastic as a valuable resource.

Henriksen continues: "We need to stop viewing plastic as waste, and instead treat it as a resource and an opportunity. The linear economy model of 'take, make, dispose' has been accelerating for the past 40 years. At its heart is a culture of waste, viewing products as disposable, with little regard for what becomes of them once discarded. In a circular economy it is possible to collect and recycle without impacting on the product's quality, so that products can be used again and again in a never-ending closed loop."

Henriksen suggests that rather than demonizing plastic as a pollutant, the

EU has adopted the right focus in setting circular economy targets, such as limiting the use of virgin plastic and incentivizing improvements in recycling infrastructure.

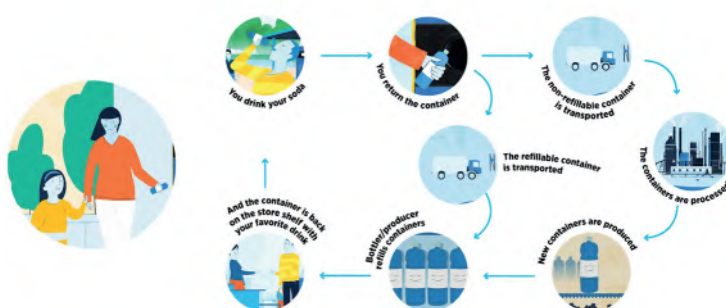
"These are very positive steps and the momentum is all heading towards a more circular economy," Henriksen continues, "but the important question is, who is ready?"

While overall the EU managed to recycle 67% of packaging in 2016 – led by strong performers such as Belgium and Denmark, who recycle around 80% – the reality is that Hungary, Croatia, Estonia and Latvia struggle to recycle 50% of their packaging, according to Eurostat data.

Deposit Return Schemes

Introducing a deposit return scheme (DRS) is the most effective way for EU Member States to meet new targets, for example achieving a 90% collection rate on single-use plastic drinks bottles ahead of the 2025 deadline, according to TOMRA.

Deposit return schemes see consumers pay a deposit of up to €0.25 on plastic, aluminium and glass containers, which is then refunded when the bottle or can is returned for recycling. Eight EU nations now have a DRS, with Germany leading the way at a 98% return rate. TOMRA's innovative 'reverse vending' machines – which enable automated collection – are



How Does a Reverse Vending Machine Work

also used in Lithuania, where a DRS implemented in 2016 saw recycling rates soar from 34% up to 92% within two years.

DRSs achieve up to 40% higher collection rates for plastic, aluminium and glass beverage containers than other collection methods and there are two main reasons for this:

Financial incentive – providing consumers with a financial incentive not only motivates them to dispose of their container in the correct place, it also communicates that the container has a value, that it is not rubbish and should be treated as a resource. In fact, deposits reduce beverage litter by up to 80%.

Increased purity – by separating bottles and cans for recycling through reverse vending machines, drink containers are

collected without contamination from other types of waste in a household recycling bin. This means it can maintain a high level of quality, suitable for turning back into a bottle, rather than being downcycled for lower quality applications.

Turning a bottle back into a bottle is a process known as closed-loop recycling, which TOMRA calls the Clean Loop. This reduces both reliance on the raw materials needed to produce new beverage containers (that is, coming into the loop) and waste ending up in landfills or in nature as litter (going out of the loop).

Furthermore, a DRS works exceptionally well when policymakers and manufacturers work together to ensure that products are designed with recycling in mind. Around 80% of a product's environmental impact

is determined at the design stage, so manufacturers should transform the way products are designed and produced, especially those made with mixed plastics that are extremely difficult or impossible to recycle.

EU Member States will have a challenge on their hands over the next couple of years to meet these new ambitious targets, however with good collaboration between manufacturers, policy makers and consumers the targets are very achievable.

A circular economy can be a result of this collaboration: having the right infrastructure in place to not only achieve high collection rates, but also maintain a high level of purity on the material collected, will ensure a bottle can be reincarnated again and again, keeping litter out of the world's oceans, streets and landfills.

SEALED AIR JOINS NEW GLOBAL ALLIANCE TO HELP END PLASTIC WASTE IN THE ENVIRONMENT



Sealed Air Corporation (NYSE: SEE) announced they have joined the Alliance to End Plastic Waste, a new global organization comprised of nearly 30 companies to date making a five-year commitment to invest \$1.5 billion in solutions to help eliminate plastic waste in the environment.

"The Alliance brings together key members across the value chain,

from materials suppliers to waste management companies, to jointly develop solutions that minimize and manage plastic waste, as well as promote means to use waste plastics in a circular economy," said Ted Doheny, Sealed Air President and CEO. "Our increased investments in innovation, including collaborations with partners such as the Alliance, will help us accelerate progress toward our 2025 sustainability goals."

The Alliance is a nonprofit organization that unites companies that make, use, sell, process, collect, and recycle plastics. These plastic manufacturers, converters, consumer goods companies, brands, retailers, and waste management companies will work together for action to better the environment and the industry.

"Keeping our environment free of waste is important to the future of our planet," said Jim Fitterling, Dow CEO. "Working with companies like Sealed Air allows the Alliance to accelerate efforts and take decisive action to put an end to plastic waste in the environment."

In addition to its participation in the Alliance, Sealed Air recently announced its 2025 Sustainability and Plastics Pledge, committing to delivering 100% recyclable or reusable packaging offerings, with 50% average recycled content by 2025. The company is also a participant in the Ellen MacArthur Foundation's New Plastics Economy initiative, and recently became a signatory to the New Plastics Economy Global Commitment

www.sealedair.com

CHANGE IN THE COMPANY MANAGEMENT

MULTIVAC Marking & Inspection is today among the leading manufacturers of innovative labelling, marking and inspection solutions. The company has been part of the MULTIVAC Group since 1993. As part of a strategic realignment, there was a change of personnel in the company management in January. Mr Volker Gerloff has withdrawn from the company management; the operational responsibility for the business has been taken over by Dr. Hendrik Frank (Engineering & Technology), Mr Karsten Strothmann (Sales) and Mrs Julia Timpe (Administration).

The new management trio has many years of experience at MULTIVAC Marking & Inspection and will ensure, that the company continues to operate successfully in the market, and that the management realign-

ment will be implemented successfully in all areas.

"Through his efforts during the last 25 years, Mr Gerloff has contributed significantly to the development and integration of the company into the MULTIVAC Group," explained Guido Spix, Director and CTO/COO of MULTIVAC Sepp Haggenmüller SE & Co. KG.

Since the company became part of the MULTIVAC Group, the expansion of the product range was systematically driven forward under the guidance of Volker Gerloff. Today the spectrum of products ranges from cross web labellers, conveyor belt and link chain labellers right through to box labellers and direct web printers. Inspection systems such as checkweighers, metal detectors and

X-ray inspection systems complement the comprehensive product range.

As recently as December 2018 a new production and office building was inaugurated at the company's Enger site. Following completion of the new building, the overall operating area has increased to around 7,400 square metres – an expansion, which had become necessary due to the company's strong growth. The company currently has around 200 employees and has had to significantly increase its production capacity, particularly in the area of conveyor belt labellers and inspection systems. In parallel with this, all the process sequences in Goods Inward and Stores, as well as in the Manufacturing, Assembly and Dispatch departments, are currently being reorganized to further optimise production.

www.multivac.com

SALE OF MILMEQ EXPECTED TO EXPAND SERVICE OFFERING FOR CUSTOMERS

Privately-held New Zealand engineering company Milmeq Limited will be split and sold in the coming months.

An agreement has been signed for the sale of Milmeq's chilling and freezing capability to New Zealand listed company Mercer Group Limited, effective from 1 March 2019.

Chairman Ralph Marshall described the sale as a good move for staff, customers and suppliers.

"Being purchased by a publicly listed company, with a range of complementary products, positions Milmeq equipment well for future growth. We have been nimble over the years, always

innovating to meet market needs, but we anticipate this innovation will further accelerate under the new owners."

Mercer Group supplies equipment to the food processing sectors under its two operating companies; Mercer Stainless, which works in stainless steel fabrication for the dairy and medical industries, and H&C, which provides automated handling systems to the dairy and meat processing industries. Milmeq will form part of the H&C business.

"Adding Milmeq chilling and freezing products and experienced staff to Mercer Group is expected to provide a number of synergies and facilitate

further expansion in the global market," Mr Marshall said.

Mr Marshall described Mercer Group as a like-minded company, with similar values and a focus on innovation and customer service.

"For our customers, we expect this to result in continued improvements to products and services, to meet their rapidly evolving needs," he said.

The sale will see Mercer Group acquire Milmeq's range of chilling and freezing systems, including tunnels, plate freezers and other products sold under licence, which it will continue to sell under the Milmeq brand.

A conditional agreement is also in place for the sale of the company's meat processing system design and engineering capability. This capability will be transferred to Australian project delivery company Wiley & Co. Pty Limited, as part of a strategy to expand their operations into New Zealand. This transfer is expected to take effect in January 2019.

Mr Marshall said the two transactions were expected to provide excellent outcomes for existing Milmeq customers.

"These sales will ensure continuity of service to our customers. And our customers will further benefit from by having access to the broader capabilities of the purchasing organisations," he said.

All existing project contracts would be completed by Milmeq Limited and new contracts would be transitioned either to Mercer Group or Wiley.

Key Milmeq staff members were expected to transfer to the purchasing companies to help ensure a smooth transition for customers. However, there were also expected to be a number of redundancies, as remaining business operations were proposed

to be wound up in the coming months.

Mr Marshall acknowledged that the change in ownership and direction meant the outcome was not ideal for those Milmeq staff members potentially facing redundancy.

"It is absolutely the low point of this transaction," he said.

The Dunedin site, including its manufacturing workshop, did not fit into the growth strategy for either Mercer Group or Wiley. Attempts to sell the manufacturing workshop as a standalone business had not been successful and, as a result, Milmeq Limited has today signalled its intention to close its Dunedin workshop over the coming months.

Mr Marshall described making the announcement for the potential closure as *"unavoidable but incredibly difficult"*.

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"We've been a family-owned business for more than 60 years, so our team are considered part of the Milmeq family. To be having to now tell these people they may no longer be a part of that - that makes this process bittersweet," he said.

www.milmeq.com

DETECTAMET APPOINTED NEW SALES MANAGER



Exponential growth and expansion have led to Detectamet appointing a new sales manager, Chris Lund.

"Chris has fifteen years' experience in selling food service equipment, working closely with distributors to develop sales for products in the UK and further afield," says Helen Morrison, Detectamet's Group Managing Director.

"As we continue to expand, Chris's role will focus on growing our market share in the UK and Europe."

"With considerable experience in the food industry, we know Chris will be able to hit the ground running."

Chris's previous positions as Regional Accounts Manager, Catering Manager and Export Sales Manager, include working with distributor sales teams to increase back selling, developing end user sales, and setting up a completely new distributor sales channel in the Middle and Far East.

www.detectamet.com

DALZIEL INGREDIENTS GROWS SALES TEAM UNDER EXPANSION



James Cowen, Gill Skipper

Dalziel Ingredients, the UK specialist in bespoke seasoning blends, cures and functional ingredients, has strengthened its sales team with two key appointments, underlining the firm's commitment to customer service as it grows.

Gill Skipper joins as technical sales account manager, after 29 years working in the food manufacturing industry with Tulip Ltd.

Latterly she was product technologist developing snacking, party food and seasonal food products - sausages, scotch eggs, pies and hand-held food - for the UK's biggest supermarkets.

In her new role, Gill is tasked with developing customer relationships and using her long experience in manufacturing to support clients on their product development.

She said: "Having worked closely with Dalziel over many years, I'm very excited to have this opportunity with them (Dalziel) to apply my skills in a sales role, visiting customers and developing their new product ideas."

James Cowen also becomes technical sales account manager at Dalziel Ingredients. Having started his career with Dalziel 24 years ago, latterly as purchasing manager, he brings a great understanding of product development to his new role.

Their appointments reflect the company's strong track record of growth, resulting in Dalziel's major £2.5m expansion at its Felling, Gateshead factory and new product development centre.

Richard Wilson, Dalziel Ingredients' sales director, said: "We've seen a

sharp increase in demand globally for our bespoke ingredients products.

"These appointments demonstrate our commitment to first class customer service as we grow, and we're delighted to welcome Gill and James to the team."

Dalziel Ingredients advises food manufacturers across the UK on flavour trends, market analysis, factory processes, recipe formulations and product quality enhancements (increasing yields, salt reductions, improved texture and fat reduction).

All Dalziel Ingredients' products - seasonings, complete mixes, rubs, glazes, functional blends, flavoured batters, flavoured crumbs, snack seasonings, cures and brines - can be developed as gluten free at Dalziel's purpose built, BRC accredited dry blending site.

Existing products can reformulated as gluten free.

www.dalzielingredients.co.uk

FRONTMATEC TO ACQUIRE LEADING SPANISH EQUIPMENT DISTRIBUTOR INTECAL

Frontmatec, the leading global supplier of customized equipment, solutions and software for the red meat industry has entered into an agreement to acquire the leading Spanish distributor and service provider of food tech equipment, Intecal - Industrial Técnico Alimentaria, S.A.

The global demand for red meat is increasing along with a growing global population. Spain has been

especially successful in meeting this demand and increased its production to become the largest producer of pork meat in Europe. The acquisition marks another step in the ambition of Frontmatec to become the global preferred supplier of equipment, projects, automation and robotics by strengthening its position on the attractive Spanish market. Besides being a leading national distributor, Intecal also offers excellent service



which is an important area that Frontmatec is keen to expand.



Henrik Andersen

Frontmatec CEO, Henrik Andersen: *"With Intecal becoming part of Frontmatec, we will strengthen our position on this vital market significantly. Along with the recent partnership with AIRA, Frontmatec is now the undisputed global leader in automation and robotics to the red meat industry and we are confident that the Spanish market will welcome this deal of combining the excellent sales and service capabilities of Intecal*



Manel Bernadó

with the broad product offering of Frontmatec."

The current owner and founder of Intecal, Manel Bernadó, will continue together with Oscar Bernadó and Frontmatec Spain General Manager Francesc Agustí to form the new management of Frontmatec - Intecal.

Manel Bernadó said about the acquisition: *"Frontmatec is an excellent*

fit for Intecal. Frontmatec has a very broad product offering and strong project capabilities within red meat which I am confident will benefit our customers greatly. It is obvious that Spain is an important market for Frontmatec and I am convinced that Intecal together with Frontmatec Spain and AIRA Robotica, both with whom we have a very good relationship, will grow together to become the preferred supplier to the food industry in Spain."

Speaking about possible changes to the future business set-up, Manel added: *"We will continue working with our long-standing business partners - they are all complementary to the strong product offering of Frontmatec and we will continue supporting our customers in Spain with best-in-class support and service which Intecal is renowned for."*

www.frontmatec.com

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PLANT MEAT: CARNIVORE NO MORE

Henk Hoogenkamp

Part 2

Texture and color are considered the Holy Grail when it comes to using plant-protein ingredients to mimic meat. It is a fine art to duplicate the textural subtleties such as chewiness, fibrosity, and flakiness of the meat or fish. Proprietary innovative manufacturing and formulation technologies have become available and are now increasingly used for animal-protein replacement.

Flavor and Aroma is Key

Other major differences are the flavors and aromas of meat, which is especially true for beef. When beef is cooked, literally hundreds of different aroma compounds come through and together create the ultimate taste humans prefer, which is the golden standard for comparison and quality reference. Undoubtedly, flavor and texture of meat is hard to replicate. This is, by far, the highest hurdle for the meat alternative products to climb.

Plant protein ingredients, as well as support additives such as konjac—a fibrous root vegetable with a rubbery texture/consistence—can be modified for varying degrees of textural density to meet consumers' expectations.

Undoubtedly, vegetarians and vegans alike want burgers, and until recently, they were willing to eat over-seasoned and under-hydrated cardboard-like textures. However, those days are gone. Now there are a few vastly-improved meat-free burgers like the Beyond Meat, Moving Mountains, and the Impossible burger that are getting much closer to the real thing.

Meat flavors develop at different rates just like fat, connective tissue, and meat cook. Subsequently, the caramelization

reaction of carbohydrates creates hundreds of flavor compounds during heating. This is a very difficult problem to solve for the vegetarian burger formulators. However, let us pause for a moment and recognize that true vegetarians and perhaps flexitarians, have debased their flavor and eating sensations. Quite a few perhaps do not know or have forgotten what an actual pure beef burger tastes like.

Even when plant protein-formulated meat equivalent products reach a high degree of flavor, aroma, and texture



equivalency with the real McCoy, one major component is still missing from the burger attributes: blood. Of course, there is no real blood in raw meat but rather a combination of myoglobin and some extracellular water that creates the reddish-looking meat juices.

The mission of the entrepreneurial-driven meat analog companies is to improve human health, positively impact climate change, conserve natural resources, as well as improve animal welfare. The new plant-based meat substitutes are

strikingly similar in taste and texture to animal protein and have an aura free from bioengineered foods.

Consumers at Turning Point

It is a definite sign of the times that even very traditional German meat companies are now entering the market for meat substitutes. Trends seem to indicate that meat alternatives sales in affluent markets are developing at the expense of meat: Meat analog sales are expected to pick up continuing momentum and register double-digit growth patterns, whereas meat sales in some affluent countries like Germany are on a slight decline.

The plant-based meat alternatives are a category that is outpacing growth in the broader packaged foods sector. Strangely, most of the sales growth of plant-based meat products does not come from vegetarians but rather from the millennial consumers (born 1982-2004) and their children who facilitate a long-term habitual change in consumption patterns.

Global Perspective

Despite the steady increase in global meat consumption averaging plus 3 percent each year, there is a collective push by entrepreneurial companies and capital venturists to shake up the meat supply chain, citing environmental and health concerns over intensive factory farming of animals. For example, Impossible Foods has received funding and support from Bill Gates-owned company Cascade Ventures, Google Ventures, Temasek Singapore and Khosla Ventures. It is remarkable that Venture Capital

funds increasingly focus on investing in alternative proteins.

Expanding into the fast growing plant-based proteins market is a strategic growth platform, which supports the commitment to become part of the journey for food sustainability. The overriding reason is that animal protein is the most vulnerable and resource-intensive part of the world's food supply with an immense use of land and water, pollution and antibiotic abuse to keep animals "healthy", and hormones to accelerate growth.

A possible future scenario for innovative technologies is in blending structured plant protein with a portion of animal meat or cultured meat, formulated to create wholesome and good-tasting foods. These products can be termed "hybrid foods". It is clear that innovative extruded structured plant protein products have reached a high degree of technology, which enables a successful duplication of authentic organoleptic meat properties.

Soy: A Missed Opportunity

It remains a mystery why the rather conservative US soy protein industry had a lackluster attitude about the necessity of product innovations to further advance the market. Instead, they took the easy way forward and carried on using dated technology extruding defatted soy flour - limiting its applications due to flavor constraints - and continued maximizing inclusion levels which clearly did not impress consumers. Even though consumers showed a strong dislike due to negative perceptions and flavor associations, the soy protein industry did little or nothing to make the necessary changes to improve acceptance levels. The large soy companies are now facing a new landscape in which they are no longer considered a pioneer but have become followers in a market they once dominated.

Alternative Meat

Computational science application is increasingly successful in determining values of plant species, such as those present in soy, wheat, corn and rice, as well as finding combinations to create nutritive and great tasting sustainable sources of protein and other bioactive phyto-compounds.

An example of an emerging ecologically-sustainable food source is the Jackfruit tree. The Jackfruit tree is indigenous to Southeast Asia and can be considered a highly neglected food source. The fruit is low in protein but high in dietary fiber that, when cooked, uniquely mimics the fibrous texture and appearance of (pork) meat. The fruit needs minimal processing and can be crumbled, shredded, minced or pulled when heated. Jackfruit trees grow in the wild and the fruit needs to be harvested before it ripens. This



plant-based whole fruit is non-GMO and another food choice high in dietary fiber, low in sugar and hypoallergenic.

Combining the virtues of plant protein and technology has unlocked the secret to create near-perfect replicas of muscle meat. These meat analog foods are formulated using plant proteins derived from wheat, soy and pea using a structuring process that uniquely creates and mimics meat-like alignment and fibrosity. This technology breaks away from the typical, outdated extrusion processes of meat substitutes - such as the rather old-fashioned textured TVP soy flour- which often lacks the fibrous texture moisture retention and has poor

flavor. Traditional textured soy flour is considered merely as filler without real textural improvement.

However, premium extruded structured plant protein can successfully replace lean meat. The modern technology of structured plant protein is a great technology and its success is mainly determined by the composition and formula percentage, as well as the mechanical and thermal process to create a fibrous appearance that will duplicate the organoleptic properties of meat. In fact, the journey from tofu or "meat from the field" - to extruded structured meat analog ingredients has taken more than 2,300 years.

Structured plant protein foods have a lot of advantages: no cholesterol, no trans fats or saturated fat, and are made of plant proteins free from antibiotics and hormones that are so typical for lean meat. Premium plant-based meat analog foods are products that look like real meat or meat products when cooked and can be pulled into shreds, or appear as minced or crumbled, or used as part component of an emulsified vegan sausage like a hotdog and bologna.

Perception is Reality

To gain acceptance from mainstream consumers, the meat alternative should ideally be just as a convenient, tasteful, and ultimately even cheaper than the animal meat protein product. Over time, "plant meat" products are expected to be cheaper than animal-harvested meat products.

In principle, structured "plant meat" is a manipulation of plant protein and other minor ingredients to perfectly mimic the texture, appearance, consistency and nutritional approximation of cooked meat. Today "plant meat" foods are priced higher than average supermarket beef and chicken, but less than premium varieties like cooked, free-range chicken.

At a molecular level, everything from an animal's lean and fat tissue can be replicated using plant fractions instead. For example, the "plant fat" can be replicated by using several methods and one specific technology is to structure coconut oil with extruded plant protein and pea protein or potato protein to entrap the fat. When heated on a grill, the plant fat begins to melt, very similar to beef fat.

Impossible: A that Bleeds

The unlikely has become a reality: the engineering of a plant-based burger that smells, tastes, looks and even feels like ground beef. These formulated products will sizzle and brown on the grill in a similar way as the animal-derived meat patty.

The essence of meat is the compound called heme. In blood, the heme is present as hemoglobin, while in meat muscle it is called myoglobin. It is striking that the leghemoglobin present in the roots of soy and alfalfa and the myoglobin in meat both share similar 3-D structures known as an alpha helical globin fold, which centers at the heme.

Leghemoglobin -the star ingredient of the Impossible Burger- is a protein found in nodules attached to the roots of nitrogen-fixing plants such as soy, that is similar to myoglobin and hemoglobin generally recognized as safe (GRAS). It is made using genetically-engineered yeast -the DNA of which has been retooled to produce the color that is strikingly similar to blood. In the future, leghemoglobin will likely be considered a color additive in some other potential plant-based meat applications.

The molecule of heme is identical to the myoglobin that is in an animal or in human blood for that matter. Heme is essential for all forms of life in humans, animals and plants. In organoleptic sense,

heme creates the (metallic) flavor in the raw and cooked products. During the cooking process, heme typically interacts with some of the ingredients like amino acids, sugars and vitamins, creating a "meaty caramelized and roasted aroma".

Impossible Food's name to fame has been the creation of "plant blood". This ingredient makes a meat-free burger that not only look and taste like beef, but also bleeds like the beloved all-time American favorite. US restaurants now

artificially manufactured with slightly more finely-grained appearance. When cooked in a skillet pan with some oil, it immediately begins to sizzle and some of the coconut oil emulsion oozes out. After a little while, the patty starts to brown upwards from the bottom and begins releasing some of the "plant blood" juices. When the patty is flipped, a brown crust appears and it is striking to see that the burger has really firmed up like a beef patty. (As a side note, coconut oil is known for its unique fatty acid profile and is rich in medium chain triglycerides and lauric acid.)

To simulate "beef fat", coconut oil and functional plant protein ingredients -i.e. potato protein and or soy protein- are typically used. Such a combination provides the sizzle during cooking and the mouthfeel of fat while eating. (Sizzling is the fat leaking out when a certain grill temperature is reached and allows crust and flavor/aroma development.) It is noteworthy, that the cooking time and temperature are slightly less than that of a traditional burger.

Not only animals have hemoglobin, but also other nitrogen-fixing plants such as soy, clovers, or alfalfa -which captures nitrogen- can be used to create leghemoglobin (a heme protein). This is done by using specific soy DNA that is inserted or infused it into a modulated or genetically-engineered yeast strain. It is well known that yeast is the modern workhorse of cellular biotechnology and increasingly used in a plethora of foods and beverages like alcohol, animal-free rennet for cheese processing, pharmaceuticals, and modification of many types of protein ingredients. These modulated yeasts also play an important role to make "plant blood" by means of fermentation.

The trick is to use yeast and fungi to create plant-based heme compounds



serve these plant meat burgers that originated from the world's technology hub Silicon Valley, California. The Impossible Burger production capacity will be ramped up quickly now that the 8000m2 manufacturing facility in Oakland, California, is in full production, and initially aiming for about 450,000 kilos 'plant meat' a month, or the equivalent of some 6.2 million plant-based burgers a month.

There is no doubt that the Impossible Burger is getting closer to simulating the typical beef burger. In its raw state, the burger looks a bit reddish and somewhat

that truly simulate the typical beef juices. Heme is an iron-containing molecule that is present not only at high concentrations in animal lean muscle, but also in legumes like the roots of the soybean and alfalfa. To recreate meat hemoglobin, oxygen is brought in contact with iron. The result is a red compound that is exactly what separates “red meat” like beef and “white meat” like chicken and, to a lesser degree, also pork.

The roots of some legumes like the soy plant and alfalfa have nitrogen-fixing properties. Using cellular biotechnology, specific single-cell yeast strains have the ability to make plant blood, also termed leghemoglobin. A rather traditional fermentation process is used to complete the production of the purified heme in which most of the yeast is removed. It can be debated that this method of heme technology skirts the process of genetically-modified organisms, and it remains to be seen how the natural food aficionados react when they have the option of purchasing these types of plant meat foods.

Although the “Impossible Burger” is entirely made of plant components, it can still be considered a product of cellular agriculture. The heme that gives the Impossible Burger its distinctive bloody appearance and taste is produced by taking the soybean gene that encodes the heme protein and transferring it to yeast. When cooked on a grill, the heme gets transformed into an explosion of organoleptic preferences.

Impossible Food’s strength centers around a technology that leverages molecular engineering to create “bleeding” plant-formulated burgers to greatly enhance the replication of the color and flavor. It is only a matter of time before these technologies have totally disrupted the traditional meat companies, including the fast-food restaurants like McDonald’s and Burger King. For now, the burger chain White Castle has rolled out the plant-based Impossible Burger in all their 377 restaurants across the US and Impossible Food is expected to go retail in 2019.

Impossible Burger Ingredient Line-Up

- Water
- Extruded Pea Protein
- Coconut Oil
- Potato Protein
- Natural Flavors
- Leghemoglobin
- Yeast Extract
- Sodium Chloride
- Isolated Soy Protein
- Konjac Gum
- Xanthan Gum
- Vitamin B1, B2, B12.
- Zinc

Beyond Meat Burger Ingredient Line-Up

- Water
- Extruded Pea Protein Isolate
- Expeller-Pressed Canola Oil
- Refined Coconut Oil
- Bamboo Cellulose
- Methylcellulose
- Potato Starch
- Natural Flavor
- Maltodextrin
- Yeast Extract
- Salt
- Sunflower Oil
- Vegetable Glycerin
- Dried Yeast
- Gum Arabic
- Citrus Extract
- Ascorbic Acid
- Beet Juice Extract
- Acetic Acid
- Succinic Acid
- Modified Food Starch
- Annetto

Perception Is Reality

Most of the growth in the alternative meat segment comes from both the younger affluent millennial consumers and the baby boomers who proactively seek out foods that fit their lifestyle. These lifestyle reasons can be manifold -be it healthy, ethical, or simply distinctive eating experiences, feel-good, and the preference for natural and recognizable ingredients which often translates to the

desire to eat less farm-raised muscle meat. The substitution of meat proteins with plant proteins is spreading, though it is fair to say that the global world market is still minuscule as a percentage.

It is too early to tell if the success rate of this pathway will be able to replicate all the benefits of animal protein using the most traditional methods. When farm-raised animals convert energy-dense, micronutrient-poor crops such as grains into micronutrient-dense foods like milk, eggs, and meat, the food production will reach an enhanced capacity to meet the micronutrient requirements of the population.

There is little doubt that finding a true alternative to meat for the general public is, by far, the biggest obstacle to tackle. After all, eating meat is deeply embedded in emotional, cultural, religious, and psychological associations. But, just as text messaging and emails have changed the way people communicate, society will change over time and adhere to a new identity of the food they eat.

Plant Protein Taste Considerations

Plant proteins tend to taste bitter, a clear disadvantage when compared to animal proteins present in meat, eggs and dairy. Flavors are frequently used to mask the bitter note of the plant protein ingredients.

The texture, bite, chew, and the right level of juiciness are created to assemble the right balance of the various plant protein properties. The organoleptic, and performance properties of plant proteins, need to be cleverly orchestrated. Wheat gluten is normally used to give the burger structure, firmness, chew and some protein lamination (fibrosity), while potato protein is ideally suitable to hold water and transition from a softer uncooked state, to a more defined solid state when cooked. The potato protein is absorbed at the fat:water interphase, and plant fats, like deflavored coconut fat, canola oil and rice oil are suitable emulsion carriers.

Color Tuning

For plant-based meat products, color is an increasingly important purchase driver. In marketing lingo, the Instagrammability of a food product is a trend that is mainly driven by Millennials and Gen Z. As such, the food should be photogenic –visually exciting, appetizing, and instantly perceived as natural. Yet, at the same time, the terms “natural” and “clean” are often interpreted differently by the industry and the consumers. The latter group wants to understand what is in their food, preferably with no, or very minimal chemical alternation.

Compared to animal protein foods, plant proteins can be problematic in masking both strong colors and off-flavors. Color is probably one of the most organoleptic variables in food’s appeal. Plant-based meat manufacturers have become creative in finding ways to mimic the color in meat alternatives.

Plant-based botanical, and/or vegetable extracts include beetroot, saffron, red radish, lycopene, and sandalwood extract. These selective color pigments, extracted from fruits, vegetables and botanicals, are a way forward to deliver vibrant colored plant-based foods in a more natural and cleaner way. In addition, some of these color extracts like beetroot, lycopene, and turmeric are increasingly recognized for health benefits.

Each and every one of the color additives selected have their own efficiency, and these variables also depend on whether the plant meat product is sold “raw” or “cooked”. When cooked, a typical brownish color is required. Caramelized sugar and/or malt will achieve the desired appearance.

Most of these coloring-support ingredients face some particular challenges such as heat stability and pH sensitivity. For example, lycopene can be an effective solution for plant meat products in which heat instability is at play.

Umami: Going Forward with Mushrooms

Meat consumption is expected to rise sharply, especially in developing countries. This is mainly due to improved living standards, including a higher financial status and improved health. There are also unsettling environmental and health consequences to consider. These include loss of biodiversity, higher greenhouse gas emissions, water pollution and deforestation. However, it is futile to expect that meat consumption will decline, though it will perhaps be possible to reduce the growth curves with a concerted effort.

The inclusion level of structured extruded plant proteins in hydrated form, ranges from 100 percent meat-free to approximately 20 percent. A typical pattie formula includes a stable fat and water emulsion that acts as a carrier, to which hydrated structured plant protein ingredients are added. A novel idea is also to include stabilized cheese curd and probably rice curd for more meat-free options.

The use of mushrooms in blended burgers, other ground meat and poultry products may allow for a significant reduction of sodium and fat. Mushrooms contribute to the creation of a desired umami flavor because of the presence of glutamate. Mushrooms can be added to the blend as pre-blanching, or as a powdered concentrated natural glutamate ingredient. At a usage level of 0.3 to 1.0 percent, the powdered ingredient provides the much sought-after umami flavor, allowing up to 50 percent salt reduction. Any mushroom variety will deliver value: white button, portabella, and shiitake boost umami flavor, while enhancing texture and moisture management in both hybrid and plant-based formulas.

Beef, and or plant-meat products blended with a significant portion of mushrooms are now en vogue and have become a regular offering in food service and food markets. Besides the sustainability attributes of mushrooms, like carbon

footprint reduction, anti-inflammatory and antioxidant properties, they are an ideal vehicle to lower the cost for both premium beef of “plant meat” formulated products. The “beef-mushroom” burger is not something that has been concocted in the 2018s. In 1994, the writer of this article developed for McDonald’s Indonesia a “low-cost” burger sandwich, using mushroom stems to add texture, chew, flavor and favorable price points.

Analog or Hybrid

Innovative structuring technology is now available using plant-based protein ingredients that are dried immediately after extrusion. These products are hydrated before use at prices significantly cheaper than meat. This form of extrusion is growing at a much greater speed than high-moisture processing. For now, a few entrepreneurial-driven companies that sell meat-mimicking food to affluent consumers, mainly use high moisture extrusion.

Extruded structured plant protein fibers and chunks will increasingly cut into lean meat formulations to either enhance or replace significant amounts of expensive meat sources. Most probably, beef and tuna foods will be the first to develop into “fusion” or hybrid meat products or even become animal-free altogether. Beef, salmon, and tuna are expensive muscle foods. Structured plant protein will not only deliver cost-savings but also contribute to a more efficient and economical use of transitional protein sources. Although chicken is a relatively cheap source of muscle protein, there are dynamics to infuse chicken food with structured plant protein ingredients in a wide range of hybrid chicken products, like those appearing on menu boards of the world’s largest fast food companies.

Plant Meat Production

The structured protein ingredients can be extruded in many different shapes, sizes, and colors like nuggets, pellets, mince, flakes, and fibers. These products are often formulated using two main

components: soy protein and wheat gluten. These two components have covalent disulfide bonds and non-covalent interactions, creating a typical configuration also known as lamella. These lamellas look like fine sheets of material held closely together with hydration fluid in between.

The composition of the extrusion formula largely determines the physical appearance and organoleptic attributes of the structured protein. Both fiber structure and laminar properties (cross-linking and a reformed expandable structure) play important roles, and are an integral part of the end product's characteristics.

Plant protein ingredients open up in the extrusion barrel to interact with the other formula components such as wheat gluten, potato starch, and plant fibers. Functional plant fibers like those extracted from rice and fruit can be considered support ingredients, and low inclusion levels may be part of the formula. These (water-insoluble) fibers typically act as a "dispersing phase", somewhat interrupting the nucleation of the melt, and create a kind of diagonal expansion showing a zigzag pattern. Nucleation (aggregation/sticking together) is often found to be sensitive to impurities in the thermodynamic phase of the formula system.

Gluten can be considered a main ingredient for creating lamination of the extruded structured plant protein, whereas, soy or pea protein supports the creation of the longitudinal formation of the fibers that mimic cooked meat fibrosity and appearance. Changing the wheat and soy or pea protein ratio can modify the structure of a textured rehydrated plant protein particle. This is especially important to create elasticity and stress relaxation properties, duplicating the structure of muscle, thus, closely mimicking cooked meat.

Specifically, the breaking of the chemical bond in the proteins –disulfide bonds– is essential for the protein molecules to

realign and link into longer chains, a process very similar to polymerization. The continuous flow of the protein dough and the subsequent breaking of the disulfide bonds can create extensive stress on the metal composition of the barrel lining, and should be monitored.

The reassembling of the disulfide bonds causes the much sought-after

properties to resemble mimic meat-like properties. The conditioned dough has a typical processing temperature of 120°C – 130°C which finally reaches the die mounted at the end of the long barrel. The simultaneous shearing and cooling in the end-compartment boost lamination and cross-linking. The product is cut and shaped exactly at the point of pass-through at the die.



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The combination of added moisture, heat, shear, and pressure in the extruder barrel creates gelatinization of the starch and denaturation of the plant proteins. This builds a viscoelastic mass that flows and allows alignment as well as cross-linking, then immediately expands into the required shape and structure when finally escaping the die.

Besides the important role of soy protein and wheat gluten, there are a few secondary-support functional ingredients used to improve not only organoleptic quality but also water-holding or water retention. For the latter, stabilized rice bran or rice fiber can be used at an inclusion level of up to 2 percent to improve the speed of hydration and water retention.

Flavor and Color

Extruded structured meat analog particles still have an overhang of distinct soy, pea or wheat flavor. The freshly extruded granules or chunks can only be seen as an intermediate product that still needs flavoring through marinade diffusion. Depending on the specific properties of the structured meat analog fibers, the water hydration ranges from 2 to 4 parts. These levels of hydration are typical and analytically provide the same protein values as lean meat.

For the use of typical chicken or beef flavors, certain amino acids –the key component of sodium glutamate– can be used to create the much-heralded umami flavor, one of only five that the tongue can perceive. The hydration or marinating is usually done in large stainless vacuum tumblers that allow flavors, such as hydrolyzed plant proteins, yeast extracts, and seasoning/spices, to diffuse into the structured plant protein membranes.

To simulate cooked beef color, both caramel and malt can be used as a component of the plant meat. New technologies have been developed to include stable heat and color forms of hydrolyzed protein flavors. The inclusion level of these natural flavors is less than

1.0 percent and allows for the by-passing of flavor addition and diffusion when the final product is assembled in the processing plant

Noteworthy is the addition of minute amounts of titanium dioxide, often used to camouflage the grey color of the soy protein into something more appealing to create the typical cooked chicken breast look.

High Moisture Extrusion

Premium (high moisture) structured plant protein foods have taken a page from Apple founder Steve Job's credo that "People don't know what they want until you show it to them." Some of the world-famous Silicon Valley entrepreneurs are now investing in companies that use radically different approaches to create a more sustainable food supply chain by primarily focusing on providing alternatives to animal protein.

Market research in consumer attitudes and expectations can be tricky and misleading. The cold fact is that "you can't ask your customers to tell you what to do next. They simply don't know, until it is shown to them." (James Dyson, WSJ December 9, 2017). These words from James Dyson echo the words of Steve Jobs.

High moisture extrusion (HME) can be described as a system in which a blend of plant proteins, starches and processing aids are moved into a pre-conditioner where water and oil are added. This mixture is then moved into co-rotating and intermeshing steel augers, where specific steam heat, pressure, and shear conditions alter the protein structure, including the influence of chemical expansion properties of the support additives. This mechanical process very quickly creates a dough-like paste while pushing it forward into the long barrel for transformation into a laminated and fibrous or fibrated meat-like product.

Innovative extrusion technology allows conversion of plant protein to animal protein characteristics like meat properties.

It requires quite a bit of knowledge about protein interaction and extrusion expertise to perfectly match the organoleptic properties of cooked meat.

High moisture extrusion technology generates products to have the taste and mouthfeel of genuine muscle meat, without the need for rehydration. These types of plant meat foods are perfectly suitable for "heat & eat" consumption.

The product specifications of high moisture meat analog products are typically similar to harvested meat: 70-75 percent water, 15-20 percent protein, and 2-5 percent fat.

For now, the downside of high moisture extrusion, is its rather high consumer prices. Retail prices are typically higher than its meat equivalent. Only affluent consumers can afford these high prices. Eventually, prices need to come down to be competitive with animal protein. The future starts today and an entirely new plant protein platform will emerge, changing the landscape forever.

Moving Ahead

To immediately reduce meat consumption, the way forward should be to choose a path where lean meat is blended or infused with structured plant protein extrudates that ingeniously mimic beef, chicken or tuna by infusing hydrated structured or fibrated plant protein ingredients or particles with a portion of lean meat. World-famous franchised restaurants have successfully introduced this concept by using this technology to offer affordable chicken patties, burgers, breakfast links, pizza toppings, and spaghetti meat sauce while maintaining nutritional value.

Existing formulated-meat products will likely undergo conceptual changes. For example, coextruded dumplings, hot dogs, hors d'oeuvres, pizza pepperoni, and burgers will continually evolve until they are no longer perceived primarily as a meat product. For example, KFC (UK) is testing chicken-like vegetarian

options and planning to launch in 2019. The vegetarian chicken substitute initiative is based on how the main fast food restaurants have started to respond to the growing demand for meat-replacement products, which is another clear sign how breathtaking fast the plant-based meat sector is moving.

The same is true for hand-held "pocket" foods. This category has expanded into a wide array of products for people who have little time or desire to sit down for a meal. Hand-held wrapped foods originated in the Orient, where they were known as "lumpia" or spring rolls. Today, these products come in many varieties - from tortillas to a growing selection of mix-and-match foods - based on ethnic preferences, flavor, and taste.

Wrapped or handheld foods may be considered as the beginning of the demise of meat as the main focal point of a meal, and will slowly be transplanted by

food-on-the-go. Here, meat is "hidden" in wrapped fillings and stuffing, which serves as a characterizing ingredient with significantly less emphasis on the species - whether beef, poultry or fish.

With the growing popularity of plant-based meat foods, this category is expected to skyrocket. The latter is also true for the sales of fish substitutes -including sushi, often considered the last frontier that people will give up. It will be interesting to see how the Good Catch "fishless" products are accepted when introduced later this year. The potential of "fake-fish" has been underestimated, but consumers are starting to recognize the negatives of commercial fishing practices and the mercury levels present in fish as vegetarian foods become more mainstreamed.

Some may bemoan the change, but the new concept of formulated meat foods as tasty and convenient ingredients will not only accelerate consumer demand,

but also serve as a catalyst for modern applications with the real use of plant protein as the chosen protein for a new line of products. Hence, providing sustainable, affordable, environment-friendly, nutritive, and tasty convenience foods.

About the author:



Henk Hoogenkamp

Former President DMV USA
(a Friesland Campina company),
Senior Director Strategic Technology
Dupont Protein.
Board member RIBT.
Author and Publicist

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IFFA 2019 - OPTIMISED PRODUCTION THANKS TO DIGITALISATION

Optimising production processes is increasingly based on digitalisation and interlinked networks. The objective is to increase security of production and optimise the use of the machinery, to work in ways that are more energy-efficient and to be able to react more flexibly to changes in the market.

From 4 to 9 May, leading international companies will be showcasing their latest technologies at IFFA and providing information on the major trends and developments in the meat-processing industry. A considerable amount of space is devoted to the optimisation of production processes. The examples of best practice on show at the trade fair offer trade visitors a host of valuable hints in this regard, together with assistance in making relevant decisions.

Smart Sensors - Senses for the Machines

In the 'smart factory', products and individual machines spread throughout the factory must communicate with one another and organise, regulate and monitor themselves. One of the basic requirements for this is the ready availability, at all times, of status data on products, machinery and drive mechanisms, bearings and so on. This task is undertaken by so-called 'smart sensors'. As well as the actual sensor itself, which captures the magnitude of the relevant parameter, they include integrated micro-processors for processing and analysing the signals. Alongside traditional parameters such as temperature, power usage, torque and pressure, they also record gases and microbial contamination.

Paradigm Shift in 'Condition Monitoring'

Traditional maintenance at fixed intervals or at a given number of hours of operation usually takes place too early, for reasons of safety, and thus shortens unnecessarily the running time of still perfectly serviceable components such as drives, shafts and bearings. As a result, companies lose both money and valuable resources. Mechanical damage does not just appear from nowhere. It makes itself known well in advance with unusual noises, vibrations that suddenly appear, or temperature increases, as well as increased power consumption and the like. These changes can be picked up with the help of intelligent sensors

in real time, monitored online and assessed, using appropriate CMS (Condition Monitoring Software). This makes it possible to target maintenance more specifically and provides valuable information on further possible optimisation of machinery and plant.

Rfid Chips Provide a Convincing Electronic Job Ticket

RFID (Radio Frequency Identification) makes it possible to transmit data wirelessly in real time between transponders and read-write heads. Integral transponders in slaughtering hooks, feeding troughs, pallets, packaging or machine parts communicate bi-directionally with read-write heads installed at the



processing and packaging stations. Thus, for example, not only do the factory-fitted RFID chips in the slicer knives store the geometrical data of the blades, they also store the sharpening schedules that go with them and the encoded item and serial numbers. The RFID read-write head installed in the sharpening module reads the data from the blade, identifies it, carries out the appropriate sharpening procedures and then updates the transponder data, including details of remaining serviceability. This principle can be applied to many other processes and procedures along the value creation change.

Visualisation Systems Make for Efficiency, Transparency and Quality

The combination of digital camera and image-assessment software provide machines with the ability

to see and, with it, open up the possibility of their reacting, in specific and appropriate ways, to changes in their environment and of taking decisions. As a result, they can recognise location, position, orientation, shape, size and colour of all sorts and kinds of object on conveyor belts. The data acquired in this way can then be used, for instance, to control robots and extraction/rejection units or to assess proportions of fat and lean in the in-line classification of bacon cuts as A, B or C class goods. Further applications include checking that packages are complete in number and undamaged, as well as the correct positioning and printing of explanatory and address labels.

More Effective Planning With a Digital ‘Twin’

A digital simulation is more than just a 1:1 digital representation of its physical counterpart. It possesses the same sensors, behaviours qualities and software, and is linked to other systems in exactly the same way. And that makes it the ideal development tool for designers and builders of plant and installations.

Typical areas where the principle can be used include virtual simulations of processes and functional testing of components, component modules, machines and, indeed, whole installations, including the control and application software. This enables designers to flag up and correct errors in advance of actual manufacture and saves costs, time, resources and energy. Professionals working in sales, planning, manufacture and maintenance, from both the manufacturing and consumer sides, can run through, discuss and optimise all the different options with the help of the digital ‘twin’, as if they were working in the real world. Other



possibilities that arise as a result of digital simulation include training for future machine and plant operators and maintenance staff relating to both the system itself and the virtual commissioning system. And finally, the digital simulator can be used to operate and maintain the real plant and equipment in the real world. And this can be done across geographical borders, too.

IFFA will be opening its doors in Frankfurt am Main from 4 to 9 May 2019. All the signs augur well for the meat industry's next leading international trade fair: more than 1,000 exhibitors from some 50 countries have already signed up to be part of this sector highlight. They will occupy a gross exhibition space of 120,000 square metres – eight per cent more than at the previous event. The inclusion of the new Exhibition Hall 12 has enabled IFFA to spread its wings and grow. At the same time, the trade fair is now concentrated at the western end of the Frankfurt Exhibition Centre for the first time, and thus offers an extensive and ground-breaking trade-fair experience.

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BETTCHER GmbH



Pilatusstrasse 4
6036 Dierikon,
Switzerland
Tel: +41 41 348 02 20
Fax: +41 41 348 02 29
Email: info@bettcher.ch
Web: www.bettcher.ch

GLOBALG.A.P. c/o FoodPLUS GmbH



Spichernstr. 55
50672 Cologne,
Germany
Tel: +49 221 57776 -0
Fax: +49 221 57776 -1999
Web: www.globalgap.org

Industrial Auctions B.V.



Looyenbeemd 11,
5652 BH Eindhoven,
Netherlands
Tel: +31 (0)40 240 9208
Fax: +31 (0)40 240 9209
Email: info@industrial-auctions.com
Web: www.industrial-auctions.com

IPCO Sweden AB



2453-B Västra Verken
81181 Sandviken
Sweden
Tel: +46 (26) 26 56 75
Fax: +46 (26) 25 86 75
Email: johan.nyberg@ipco.com
Web: www.ipco.com

Kancor Ingredients Limited



Bldg. No. 814/C, Near Suburban Club,
Seaport/Airport Road, Thrikkakara P.O.,
Ernakulam - 682 021, Kerala, India
Tel: +91 484 3051100
Fax: +91 484 3051121

Web: www.kancor.com

Karl Tichy Handelsgesellschaft mbH



Salaberg 23,
A-3350 Haag
Austria
Tel: +43 664/4433221
Fax: +43 7434/44459
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Marel Stork Poultry Processing B.V.



Handelstraat 3
5831 AV, Boxmeer
Netherlands
Tel: +31 (0) 485 586 111
Fax: +31 (0) 485 586 222
Email: info.poultry@marel.com
Web: www.marel.com

Meyn Food Processing Technology B.V.



P.O. Box 16
1510 AA Oostzaan
the Netherlands
Tel: +31 (0)20 2045 000
Fax: +31 (0)20 2045 001
Email: sales@meyn.com
Web: www.meyn.com

NOCK Maschinenbau GmbH



Industriestrasse 14
77948 Friesenheim
Germany
Tel: +49 (0) 78 21 / 92 38 98-11
Fax: +49 (0) 78 21 / 92 38 98-18
Email: info@nock-gmbh.com
Web: www.nock-gmbh.com

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Irlachstraße 31
5303 Thalgau
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