INTERNATIONAL

41 / 2021

# MEATINGPOINT magazine

## SUSTAINABLE TECHNOLOGY, PROCESSING & PACKAGING

GEA Signature CHICKEN

WHICHEVER WAY YOU SLICE IT,
THE RESULTS SPEAK FOR THEMSELVES



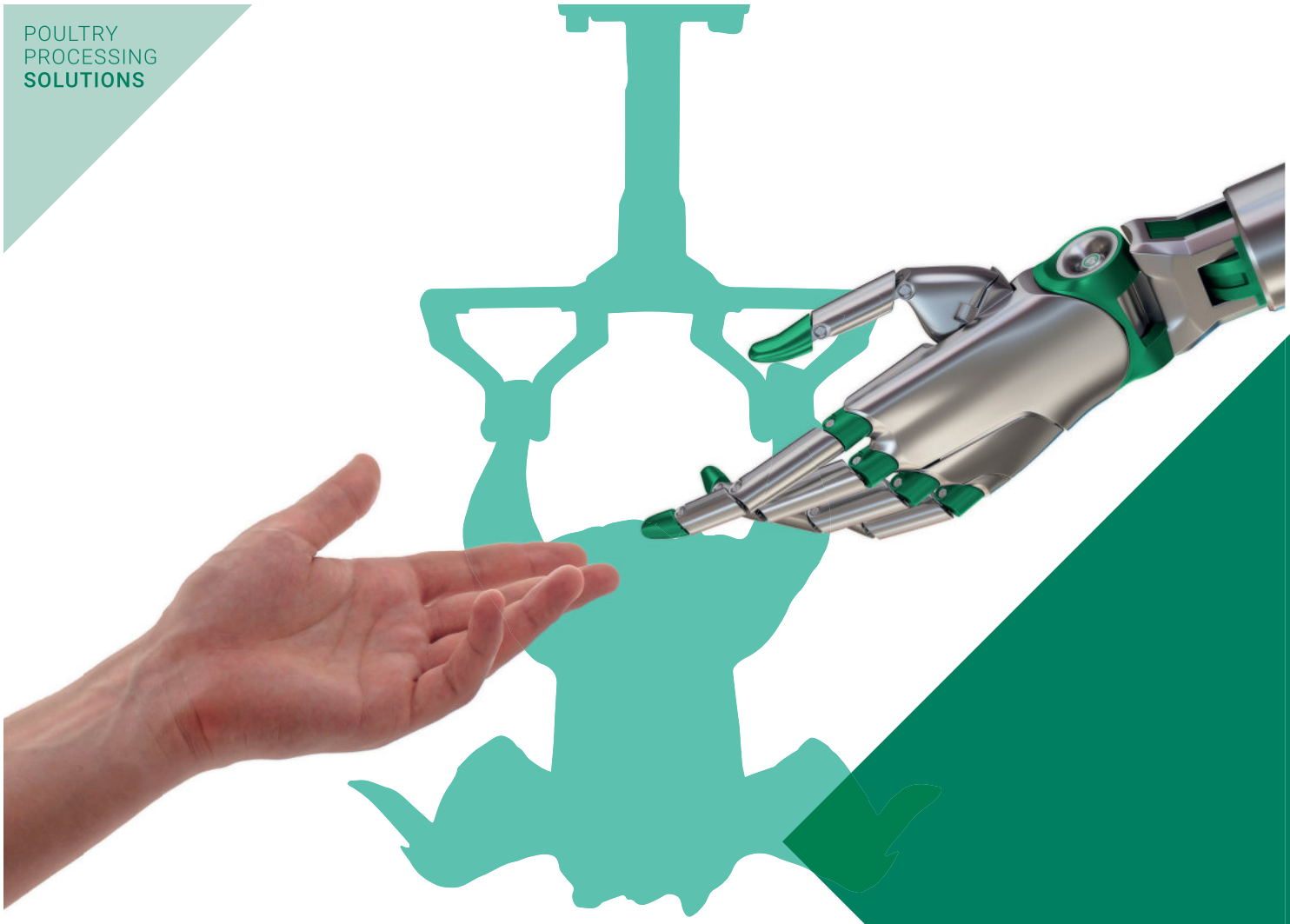
INJECT → TUMBLE → COOK

AIR CHILLING GROWTH IN NORTH AMERICA

MAXIMIZING YIELD AND QUALITY IN POULTRY MEAT PRODUCTION

MEAT PRODUCTION AND CONSUMPTION IN 2030

POULTRY
PROCESSING
**SOLUTIONS**



# Need a hand **with your labour challenges?**

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# Dear reader,

Jenny Smart

Made up of three integrated trade shows – International Poultry Expo, International Feed Expo and International Meat Expo – the IPPE is the world's largest annual meat, poultry and animal food trade show. The event is sponsored by the U.S. Poultry & Egg Association(USPOULTRY), the American Feed Industry Association (AFIA) and the North American Meat Institute (NAMI).

IPPE will be held Tuesday through Thursday, Jan. 25 – 27, 2022, at the Georgia World Congress Center in Atlanta. The Expo will highlight the latest technology, equipment and services used in the production and processing of animal food, meat and poultry products. Combining the expertise from AFIA, NAMI and USPOULTRY, IPPE will also feature dynamic education programs focused on current industry issues. Find some of the innovations to be showcased on pages 14-20.

A considerable amount of effort has been invested into sustainability programs throughout U.S. animal agriculture over the past few years. As more people across the world are gaining access to high-quality animal protein, the animal agriculture industry must continue to place sustainability as a top priority. In support of this goal, the annual Animal Agriculture Sustainability Summit will once again be held at the 2022 (IPPE) in Atlanta, and will provide provide perspectives on animal agriculture and food supply chain sustainability initiatives relative to EPA efforts to mitigate climate change and improve water quality.

In this issue, we also tackle the challenge of food security for a growing global population, questioning whether the new technologies to produce plant-based meat substitutes or cell cultured meat would contribute to a reduction of resource consumption and negative environmental impact and if they would add value to food security. Don't miss reading an article by Prof. Hans - Wilhelm Windhorst which presents a projection of the development of "Meat Production and Consumption between 2020 and 2030."

As always, we feature the industry's latest news and developments, top-notch technological innovations, company profiles, as well as research papers.

Lastly, with this final issue of 2021, I would like to say a big thank you to all our readers, contributors, and advertisers! I wish you a Merry Christmas and the happiest New Year!

## Enjoy your read!

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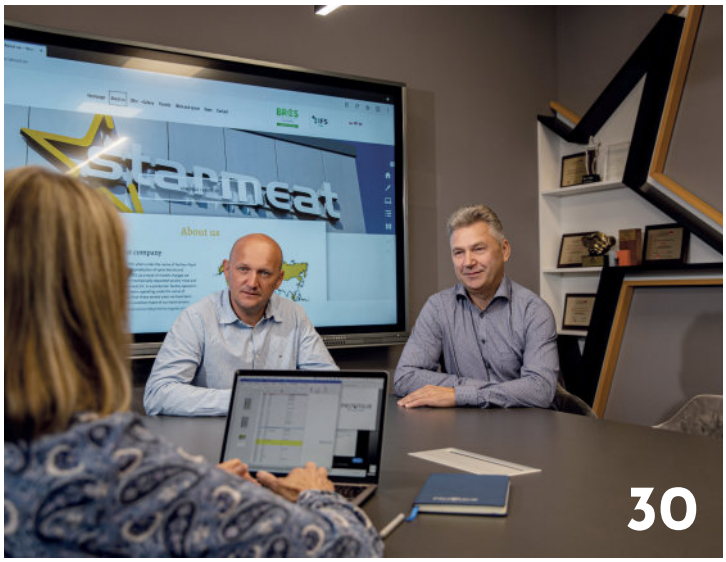



## IN THE NEXT ISSUE:

- IFFA and ANUGA FOODTEC Preview
- Slaughtering, Cutting (Blades, Sharpening Systems)
- Skinning, Deboning & Trimming, Portioning, Gringing, Separating, Sorting (Meat and Poultry Focus)
- Conveying Systems
- MAP Trends

Ordering Deadline: 11 Feb, 2022
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## INDEX OF ADVERTISERS:

# MINEBEA INTEC: FOUR WINS AT THE AUTOMATION INSIDE AWARDS


*The headquarters of Minebea Intec in Hamburg*

Success all along the line: In the Readers' Choice Awards of the international online platform "Automation Inside", Minebea Intec successfully beat the competition in December. A total of four awards went to the global supplier of industrial weighing and inspection technologies. The company thus won all the categories in which they were nominated.

The annual Readers' Choice Awards of the online platform "Automation Inside" is an established competition in which readers vote for the best automation companies and products in a total of 18 categories. The competition offers an ideal opportunity for readers to judge which products are particularly recommendable.

Three products from Minebea Intec were nominated for the 2021 Awards - and all of them beat the competition: In the category of "Best Sensor", the innovative weighing module Novego won, whose advantages were also well received by readers. The hygienic all-in-one solution is not only distinguished by its particularly easy installation: Novego reliably provides precise measurement results in weighing processes - even with transverse forces of up to 20% of the nominal load. A technological advantage that benefits a wide range of applications.


*Hygienic solution: The Novego weighing module is a load cell and installation kit in one*

In the "Best Automation Software" category, the top spot went to the successful ProRecipe XT software, which offers users a wide range of benefits. In the networked recipe management system, materials, recipes and batches can be managed and production orders generated from them, which are then made available for processing at the connected weighing stations. With an optional connection to the customer's ERP system, this step can be automated - duplicate data maintenance is no longer necessary. At the station, ProRecipe XT guides the user safely and efficiently through the weighing process with its sophisticated user guidance.

Minebea Intec took the third victory in the "Best Control System" category with an established classic, the Maxxis 5 weighing indicator, which had already secured the award in the previous three years. The crowning glory of this year's awards, however, was the award for "Best Automation Company" - whereas last year it was second place.


*With automated dosing processes, version 3.5 of the ProRecipe XT software once again ensures maximum safety in recipe management.*

"We are very pleased about the awards: Especially the title as "Best Automation Company" shows that not only our strong

### An Overview of all Awards Won:

| | |
|---|---|
| • Best Sensor | Weighing module Novego |
| • Best Automation Software | Software Pro Recipe XT |
| • Best Control Systems | Weighing controller Maxxis 5 |
| • Best Automation Company | Minebea Intec |

recipe software ProRecipeXT, but our overall package of high-quality products, comprehensive software and service offering as well as individually adapted weighing and inspection solutions convinced the readers," says Willy-Sebastian Metzger, Director Strategy, Business Development & Marketing at Minebea Intec, who also sees good opportunities to confirm the strong result for the coming year. "Despite the current difficult situation, for example concerning supply bottlenecks, our goals remain high: We want to continue to show what "the true measure" means with new offers and products in the coming years," says Metzger with an outlook on the coming year.

**www.minebea-intec.com**

## NEW WEB PRESENCE OF THE COMPANY KOMET MASCHINENFABRIK

Since November 2021, the company KOMET based in Plochingen presents itself with an appealing and user-friendly new design.

Contrary to the general mainstream in the web design, the new website deliberately abstains itself from large-format image pictures and concentrates on relevant information – in particular on products, achievements and services. This provides faster loading times as well as quick information retrieval for the user.

With the intuitively organised interface, the visitors would be able to open the website with only a few clicks and concisely get to the target. The whole look & feel is clear and minimal. A so-called "sticky navigation" allows the user to contact KOMET at any position of the website or to make requests via a search function.

In addition, numerous support functions and tips are made available to the customer on the


new website e.g., a service centre, feasibility studies, downloads such as technical bulletins, application videos, product animations, and much more.

**www.vakuumverpacken.de**

## NABTESCO ACQUIRES ENGILICO GROUP, SEAL INSPECTION SYSTEMS PRODUCER

Engilico announces that it has entered into a definitive agreement with Nabtesco Corporation (headquarters Tokyo, Japan), through its subsidiary PACRAFT, to sell 100% of the shares of Engilico Engineering Solutions NV, a leading provider of innovative packaging seal inspection technology in Belgium. The transaction also includes the acquisition of Engilico's daughter companies in Belgium and the United States.

PACRAFT, a leading manufacturer of packaging machinery in Japan, provides food manufacturers with super high-speed automatic fill/seal machines, which are used for retort food as well for a broad range of food products, such as soups and drinks. PACRAFT enjoys the top market share in automatic fillers/sealers for retort pouch foods in Japan.

Engilico's key strength is its unique software engineering capability. Its core products are SealScope, applying vibration sensing technology, and its newest offering HyperScope, which utilizes advanced camera image processing technology. In 2016 PACRAFT first introduced SealScope to selected customers in Japan with

great success, laying the foundation for a successful collaboration.

Olivier Georis, Managing Director of Engilico, said "This agreement brings our company to a new level, accelerating our strategy to establish a global presence of our innovative inspection technologies in the food and pet food industries."

Peter Nijs, CTO of Engilico added, "In the past 10 years, we have developed and marketed our innovative seal inspection solutions. We are now looking forward cooperating with PACRAFT to further refine our seal inspection technology benefiting our current and future customers."

Akiyoshi Kitamura, President of PACRAFT, commented "We welcome Engilico into the PACRAFT group. Together we are excited about offering an enhanced automated solution to our clients through the combination of packaging and in-line inspection technologies."

**www.engilico.com**
**www.nabtesco.com**

# NEW STRATEGIC PARTNER OF IFFA 2022 IN THE FIELD OF ALTERNATIVE PROTEINS

In many regions of the world, the market for plant-based and cultivated meat is booming. To promote technological advancement and exchange between the meat and alternative protein industries, the Good Food Institute Europe and Messe Frankfurt are entering into a strategic cooperation for IFFA 2022.

IFFA is the international B2B meeting place for the meat & alternative protein industries. The triennial event covers all the steps from ingredients to processing to packaging. As conventional, plant-based and cultivated meat use largely the same processing technologies, the leading equipment and ingredients suppliers will present their new developments for all these sectors from 14 to 19 May in Frankfurt am Main.

The Good Food Institute Europe (GFI Europe) is an international NGO working to build a sustainable, secure and just food system. The institute works with scientists, businesses and policymakers to advance plant-based and cultivated meat, eggs, dairy and seafood – making them delicious, affordable and accessible across Europa.

Kerstin Horaczek, Vice President Technology Shows of Messe Frankfurt, welcomes this new cooperation: "We are very pleased to work with the globally renowned experts for alternative proteins at the Good Food Institute Europe. Together we have agreed that, in addition to its focus on the meat industry, we want to develop IFFA into a true accelerator for the efficient, large-scale production of plant-based and cultivated meat."

Carlotte Lucas from the Good Food Institute Europe is equally looking forward to the cooperation with IFFA: "The fact that IFFA, the world's leading trade fair for the conventional meat industry, has chosen to make alternative proteins a key part of their agenda demonstrates the growing importance of and interest in the plant-based and cultivated meat sector. We are excited to be partnering with Messe Frankfurt and supporting the conventional meat industry in developing delicious and sustainable products that consumers around the world are asking for."

GFI Europe will present itself at IFFA 2022 as part of the IFFA Factory, the exhibition area where production processes are shown in live demonstrations. In addition, the institute will enrich the lecture programme and topical guided tours with its expertise and, thus, offer IFFA participants from the food industry an informative added value. Besides GFI Europe, Messe Frankfurt has managed to win BALPro, the German association for alternative proteins, as another important partner for the new product field.

**www.iffa.com**


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# LATEST GEA OVEN TECHNOLOGY HAS MAJOR ENERGY-SAVING BENEFITS

The latest generation of GEA's Cookstar oven, powerful new technology for the mass production of roasted, breaded and smoked products, also offers food producers cost savings on their energy bills compared to the equipment's predecessors. The newly improved airflow and dynamic climate control also makes it possible to produce a higher output and significant savings on steam.

**GEA's CookStar 1000 Gen 3** provides an extremely accurate, high performance solution which pushes the art of cooking to produce even more of what the food industry and the consumer wants. Including, succulent roast chicken, mouthwatering smoked BBQ ribs or a wide variety of delicious coated vegetarian, seafood or meat-based products. The high level of control means that these products can be cooked in a way that ensures reproducible results time after time.

Generating up to 25% more heating capacity than its predecessors through improved heat exchanger technology, the CookStar 1000 optimises the flow of air through the oven for more targeted cooking and consistent browning, reducing any waste caused by over cooking. An enhanced impingement zone gives a higher air volume for greater cooking impact and efficiency.

Whilst this latest technology is capable of generating extra heating capacity, which translates into increased throughput, it's the ability to accurately control the cooking parameters that is making the GEA CookStar the increasingly popular choice for food processors. The CookStar 1000 is the only spiral cooker on the market which can dry, steam, cook, roast and smoke products in a single machine.

The combination of optimized airflow, climate control and the dynamic exhaust system ensures very efficient cooking only using energy exactly as and when it is needed, reduce heat and steam losses, increasing sustainability.

The dewpoint within the cooking zones is managed precisely by injecting steam or introducing fresh air. The significantly improved air flow allows the cooking zones to operate independently, with a dewpoint difference up to 40°C and a temperature difference up to 200°C between the 2 zones. This allows almost infinite variable control of the cooking conditions within the oven for maximum flexibility and cooking precision, meaning that a wide range of products can be cooked using the same equipment.

Ben Kop, GEA's Application Technologist, says: "Oven technology is evolving. We have added more functionality and a dynamic exhaust system that offer significant reductions in energy consumption. We can maintain a very high humidity within the oven without excessive steam injection."


GEA's CookStar 1000 is allowing food processors to ensure that their production lines remain flexible. The increased use of 'intelligent' systems is giving manufacturers the ability to control distinct parameters according to changing consumer demand, whilst still ensuring high productivity, sustainability, reliability, and total security of outcome.

**www.gea.com**

# NEW DETECTOR TECHNOLOGIES FROM EAGLE

Any contaminant embedded in a food product gets in the way of quality and safety and causes headaches for manufacturers. In the poultry industry, minute bone fragments pose constant challenges and risks for recalls and even consumer injuries.

Such tiny pieces of calcified bone can be easily overlooked in chicken products bound for human consumption. To help processors prevent such issues and protect their products and brands, Eagle Product Inspection has developed a next-generation detector technology, Performance X-ray Technology (PXT™), that captures more detailed data about a product than previously possible. PXT™ can identify bone fragments down to 1 mm in size in fresh, frozen and refrigerated poultry


products as well as in bulk flow and retail poultry portions. When paired with the RMI 400 x-ray machine, the technology has been shown to detect bones as small as 0.6 mm.

Speed is also a hallmark of the new technology. High-resolution product images are processed instantly through the use of Eagle's latest SimulTask™ PRO image analysis software.

One company that is using this new system to find more bone fragments, including low-calcification bones in young chickens, is Giannone Poultry. The processor recently deployed Eagle's RMI 400 with PXT™ machine in its 250,000-square foot facility, after determining that a new deboning process was resulting in the inadvertent contamination of bone fragments in meat.

www.eaglepi.com

# AIR CHILLING GROWTH IN NORTH AMERICA

## A Poultry Chilling Tunnel Offers Better Flavor, Tenderness and Traceability with Less Labor Needed

More and more North American poultry plants are changing their process from water chilling to air chilling. Some major processors in the US are already extremely satisfied users of air chilling tunnels. Processors in Canada have been effectively using air chilling systems for some time now as well. Marel is on top of things, with a product portfolio that is ideally fit for this market.

Immersing products in a spin chiller, until now the most popular chilling method in the US, leads to the absorption of additional water. US processor Bell & Evans puts it this way, "With conventional chilling systems, chickens absorb up to 12% of their body weight in added chlorinated water. This water "weeps" out of the meat and is trapped in the "diaper" you will find in most fresh chicken packaging."

### Taste

In North America, the words 'air chilling' might give potential consumers the idea that the end product is drier and less hygienic. But this is what Bell & Evans says, "Our 100% Air Chilled method means no need for chlorinated ice water, so chickens' natural juices never get diluted or replaced. But that's not the only benefit. Our 100% Air Chilled method brings out the chicken's natural flavor and tenderizes the meat. It also reduces handling and environmental waste."

### Hygiene

In North America, disinfectant chemicals are added into the water tank to improve microbial quality. Air chilling doesn't need chemicals and still succeeds in keeping the process super hygienic.

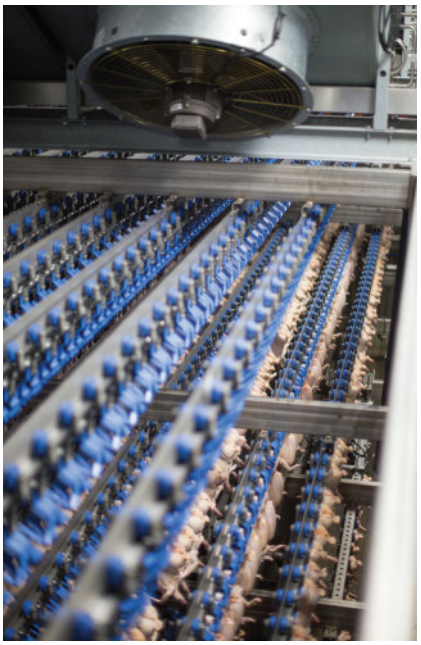
### In-line Automation & Traceability

Usually, rehanging products at the outfeed of a spin chiller involves about 15 people. Air chilling keeps the process completely inline with less need for labor. It also makes the complete process better traceable. End-to-end traceability, combined with food safety, is high on the priority list for North American customers and consumers.

### Optimal Product Quality

When designing a chilling tunnel, Marel always keeps optimal product characteristics in mind. That is the starting point. A processor may ask for a chicken cooled down to 2°C [35° F] guaranteed core temperature, with minimal loss of yield, maximum tenderness and perfect shelf appearance. This requires more than just blowing cold air; Marel ensures an optimally chilled quality chicken in line with the customer's wishes.

Cooling a chicken down is not difficult. Getting the maximum out of the process is the real trick. It's all about controlling the micro-climate around each individual chicken, while preventing drying losses, maintaining optimum yield and improving meat tenderness.



### Everything Counts

A chilling tunnel is the biggest energy consumer in a processing plant and requires a lot of space. In every chilling tunnel design, Marel looks for a technically optimized balance of footprint and energy use, without compromising product quality. It is possible to optimize energy consumption by varying details of the technical execution, such as air speed. Footprint optimization is about

adapting the size of the tunnel to hourly capacity, product weight and desired core temperature.

It should now be clear that chilling a product involves much more than

making it cold. Other product aspects have to be taken fully into consideration, while the best technical execution will depend on the possibilities on-site and customer requirements. As the authority in poultry chilling, Marel has demonstrated that it has all available knowledge to come up with tailor-made air chilling solutions for every processing need, globally.

## Chilling Authority

Marel is the leading chilling specialist in the poultry industry. Marel allocates a significant part of its R&D budget to the chilling process. For many years, together with customers and various scientific partners, the company has been doing scientific research into the most effective chilling techniques. Marel is the inventor of in-line maturation chill with guaranteed tenderness, "Plus" moisturizing technology and many more advanced chilling techniques. The wealth of experience that has been built up is reflected by one of the most widely spread installed bases worldwide. Not just in Europe, but from China to the USA, customers are using Marel's in-line chilling solutions.

**www.marel.com**

# GEA OFFERS BEST PRACTICE SOLUTION FOR IMPROVING CHICKEN YIELDS

Food processors know that with margins under pressure every dollar counts. Balancing production costs, yields and product quality all whilst keeping consumers satisfied is not an easy job, which is why leading technology provider GEA is launching its Signature Chicken solution in the United States at the 2022 International Production & Processing Expo (IPPE) show in Atlanta, January 25-27. Initial customer trials and inhouse comparative tests of the process have reported yield increases of up to 10% when compared with traditional processes. *

Specially developed with universally popular chicken products such as wings and fillets in mind, the Signature Chicken process works on the basis of moving from a tumble-cook process to an inject-tumble-cook process as best practice. Whilst this is not necessarily a new concept, it's the unique combination of specialist equipment and know-how GEA is offering that allows the increased yields.

First, the GEA MultiJector uses advanced injection technology, which achieves a more uniform distribution of marinade or brine, locking it into the core of the product. This means that tumbling time later on can be reduced. Then, after tumbling, the products are cooked, roasted or smoked in GEA's CookStar GEN 3 oven, a highly accurate piece of technology which cooks each product on the line evenly and rapidly without drying out the product so that juiciness is retained.


Central to the MultiJector is GEA's Time-in-Meat precision technique, based on the specific combination of stroke height and injection cycle time, both optimized for each product type. Thanks to the Time-in-Meat technique, the needles stay in the product longer during injection, which leads to better brine uptake. As a result, product quality and consistency are significantly increased, and higher efficiency and yields can be achieved. This automated injection system uses a high-density injection pattern with GEA OptiFlex 2mm needles, allowing for a more even distribution of brine throughout the product. Combined with low injection pressure, brining or marination time is reduced and moisture retention is optimized meaning reduced post-injection purge. No overnight holding time is needed with this method, which also means that the need for handling and storage is reduced.

The technique is highly accurate, and customers that trialled this powerful injection equipment at GEA's testing facility reported an increase in yield of up to 5 percent on average against their current processes.

Moving on to the cooking stage, GEA's CookStar GEN 3 oven brings to the process a unique

** Based on inhouse comparative tests and field-test results.*

Result from validation tests at the GEA Food Solutions Technology Center


and highly specialized method of cooking and is the only industrial oven of its kind currently on the market. The CookStar cooks with greater precision than its predecessors, using combined horizontal and vertical hot airflow in a patented impingement zone, for an even distribution of airflow across the width of the belt. This means that all products are rapidly and equally cooked at the same time. The two-direction airflow also reduces overall cooking time, allowing for increased throughput.

During the first stage of cooking, humidity is introduced to the products, bringing additional moistness, but prior to being fully cooked, the products pass through the impingement phase, which carefully dries the surface of the meat, preparing it for roasting without drying out the core. The entire cooking process is quicker than traditional processes and results in more succulent chicken with a more attractive, richly browned color. Customer trials based on the CookStar GEN 3 resulted in yield improvements up to a further 3-5 percent. To put this into perspective, according to GEA an extra one percent of yield can be equivalent to approximately one million dollars profit for food processors.

So overall, GEA's Signature Chicken solution can bring total yield increases of up to ten percent depending on the product. The process results in chicken which is more succulent for consumers as well as being more profitable for food processors.

Visitors to the 2022 IPPE show in Atlanta on January 25-27 will have the opportunity to learn more about GEA Signature Chicken during a 'lunch and learn' presentation where they can find out about how the system can be used for optimal yields.

**www.gea.com**

IPPE **Hall B Booth - 5413**

# LIMA: SEPARATION AT ITS BEST

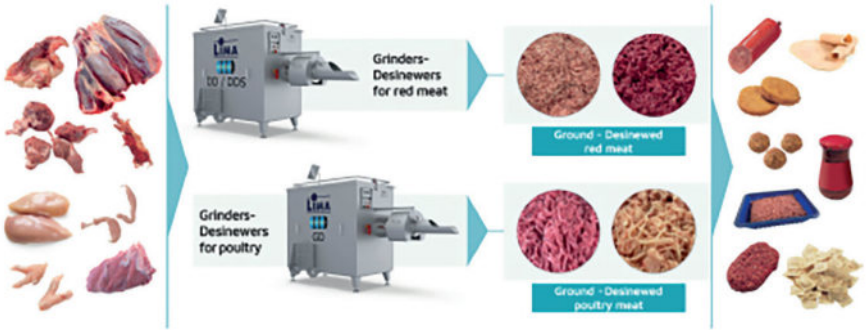
As IPPE show in Atlanta is approaching, LIMA is looking forward to in-person meetings with customers and distributors from the USA and the Americas!

LIMA as a world leader in mechanical separation will exhibit: Meat-bone separators for poultry for the highest quality of mechanically separated meat at high yields with:

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

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

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




*Maximizing profits out of boneless meat with LIMA Grinders-Desinewers*

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

Lima welcomes IPPE visitors to see its newest developments when it comes to maximizing profits out of boneless raw materials with our ranges of Grinders-Desinewers:

The purpose is to valorise good meat into a high-quality coarse ground meat by separating remaining hard tissues such as sinews, tendons, gristles, cartilage, bone chips as well as foreign plastic bodies at very high yield, from 80% to 98% while Collagen/Protein ratios remain under controlled values and the temperature hardly increases during the process. The recovered meat is NOT MSM (Mechanically Separated Meat) but actual ground and desinewed meat processed from bone-out meat.

In this respect, LIMA offers a wide range of Grinders – Desinewers DD/DDS specifically for red meat bone-out raw materials such as Beef and Pork deboned shank or shoulder meat, trimmings, aponeurosis.

This range of LIMA Grinders - Desinewers DD/DDS for red meat can process from 100 to 12 000 kg/hr / 220 to 26 450 lb/hr of raw product input.

Furthermore, LIMA has also developed a new range of Grinders - Desinewers GD specifically for poultry bone-out raw materials: fillets, trimmings with or without wishbones, deboned thigh and drumstick meat.

This new range of LIMA Grinders-Desinewers GD can process from 100 to 13 000 kg/hr / 220 to 28 660 lb / hr of raw product input.

LIMA covers many separating, deboning and grinding-desinewing applications with more than 70 different LIMA machines models which can process from 100 to 20 000 kg/hr / 220 to 44 000 lb/ hr of raw product.

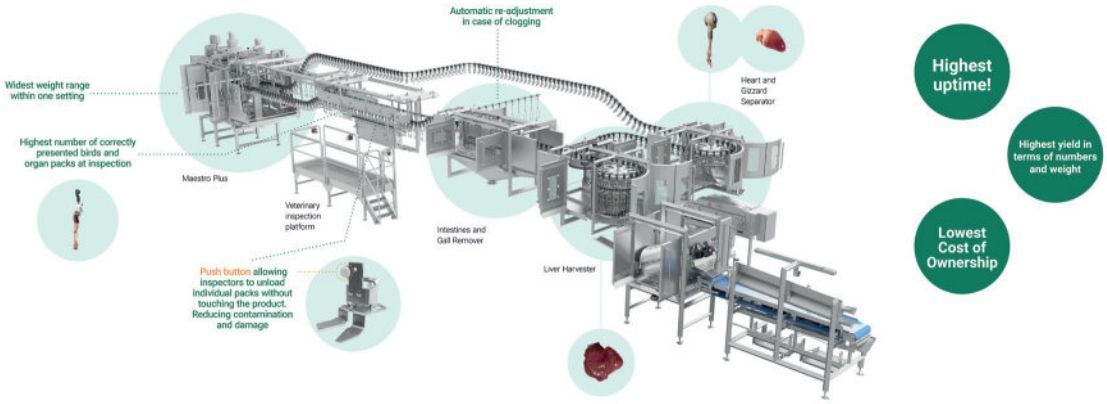
**www.lima-france.com**

IPPE **Hall C Booth - 11907**

# SMARTIFYING POULTRY PROCESSING

meyn®

**Maestro Plus**
Automatic in-line organ harvesting




Poultry processors are facing rapid changes. Being flexible in poultry processing has become vital to match fluctuating supply with instant customer demands. Add the current labor shortages, and the complexity of processing multiplies. Meyn has developed an integrated set of solutions that addresses these challenges through a concept called 'Smartifying Poultry Processing'.

Get acquainted with 'Smartifying Poultry Processing' at the upcoming International Production & Processing Expo (IPPE) 2021 in Atlanta, USA. At the Georgia World Congress Center from January 25-27.

This edition Meyn will integrate their famous processing machines with their most recent processing software called: Cynergy. A collaborative success of Meyn and their sister company CatSquared. Together with the most recent innovations in evisceration, deboning and cut-up, Meyn now offers a range of smart processing solutions for a wide variety of line speeds and bird sizes - allowing poultry processors to achieve the highest level of productivity with minimal labor.

With the demand for poultry meat being on the rise globally, and labor shortage being an ongoing challenge for many years upgrading to the next level helps. Collect & analyze data to maximize production value with great flexibility while reducing costs.

In line with 'Smartifying Poultry Solutions', Meyn has developed an integrated set of solutions that address these challenges:

## Evisceration

Meyn is proud to introduce the updated Maestro Plus automatic in-line organ harvester. Ensuring automatic giblet harvesting with the ability to handle the widest weight range within one setting – lowest downtime – lowest running costs resulting in the highest yield. With over 50 Maestro Plus systems sold worldwide, the Meyn® Maestro legacy continues.

## Cut Up

A cut-up system like the Meyn® Physic Plus M4.0 delivers all the flexibility a modern processor needs. The new design provides top accuracy and quality of cuts. The Meyn cut-up solutions are the most accurate and fastest in the market and can process a weight range from 1.0-3.2kg for grillers.

## Deboning

Automated deboning with a Meyn® Rapid Plus M4.3 running at 7,000 breasts/h requires only three workers loading the breasts on the product carriers and just seven workers for trimming – a reduction of 31 workers per shift compared to manual processing!

## Poultry Processing Data

With line speeds going up to an astonishing 15,000 BPH, data collection has become vital. Poultry processors want to control the production outcome to deliver the right product mix. Cynergy is the key to achieving operational excellence and processing the perfect match of poultry meat production.

Meyn welcomes all guests to IPPE 2021 at the Georgia World Congress Center.

**www.meyn.com**

IPPE **Hall C Booth - 12927**

# FIRST FULLY AUTOMATED PACKAGING SOLUTION FOR STICKY PRODUCTS

## New Generation Multihead Weigher for Convenience Food products

At IPPE 2022 in Atlanta, Georgia, Cabinplant A/S introduces the next generation of weighing and packaging solutions for the food industry. The fully automatic MHW SF Extreme breaks boundaries in the handling of sticky products used for the booming convenience food market.

Cabinplant A/S, Danish and US-based innovative and global supplier of tailor-made food processing and weighing/packing solutions, is ready to create a stir at the next IPPE January 25-27, 2022. The company introduces the new, fully automatic MHW SF Extreme, which is aimed at the booming convenience food market and can weigh and pack extremely sticky products.

Further, Cabinplant will present the Multibatcher, which is ideal for weighing large portions of meat and poultry to reduce give-away and labour costs. With its highly automated process for portioning up to 75 lbs batches, the solution has the potential to send the meat processing industry into the fast lane.

### Highlights at IPPE 2022:

- New generation multihead weigher: The fully automatic MHW Extreme facilitates weighing and packing of sticky products, often used for the booming convenience food market
- Multibatcher – innovative food weighing technology that increases throughput and reduces give-away and labour costs significantly when it comes to weighing and batching of large portions

### Fully Automatic MHW Extreme: Weighing / Packaging of Extremely Sticky Products

Increased automation has been limited by the widespread use of sticky ingredients in ready-to-eat products, as automated packaging plants have not been able to manage them. So far, the limit has been reached for fresh products such as chicken and fish. Stickier products have stuck to the weighing machine, but this challenge is solved by a new patented solution from Cabinplant – the Multihead Weigher SF Extreme.

The Multihead Weigher Extreme combines Cabinplant's well-known screw-feeder combination weight with new scraper/weighing pans and a new processing solution, which ensures that the food is packed into trays on the conveyor belt. The MHW Extreme has a very compact design, which make it easy to fit into existing production areas.

The new multihead weigher makes it possible to fully automate the dosing and packaging of ready-to-eat meals, which includes sticky ingredients such as diced vegetables, onion rings, rice, pasta, tuna fish, mayonnaise, yoghurt, etc. These processes were previously performed manually or partially manually, without exact weighing. - This is a technological breakthrough that breaks the boundaries of what

*Nothing sticks and stops with Cabinplant's MHW SF Extreme - thanks the unique design of pans and scrapers.*

has been possible so far with package lines and multihead weighers. Now the production of a large number of ready-to-eat meals can be fully automated, says Henning Ingemann Hansen, Director of Research and Development, Cabinplant A / S.

The MHW SF Extreme reduces the number of operator resources by 60-70 percent compared to similar packaging line of convenience products including sticky products. - The MHW SF Extreme removes a major bump in food manufacturers' roadmap, bringing a significant productivity jump and new level of accuracy in weighing of extreme sticky product mixes and reducing the labour force vulnerability of the production line significantly, concludes Michael Falck Schmidt, Sales Director at Cabinplant.

The end-product can be ready-to-eat meals packed in plastic trays, standing bags, etc. The cassettes can be replaced, which reduces the time for cleaning and changing to only 5-10 minutes and allows for frequent changes in recipes

and packaging sizes at a time when the retail trade wants more varieties as well as more frequent and smaller deliveries.

Finally, during the pandemic the food industry has become aware of the vulnerability of labour-intensive production. The new weighing/packaging machine enables increased automation and reduces the food manufacturers' risks of involuntary stoppages.

## Cabinplant Multibatcher: Box Packing in the Fast Lane

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

The raw materials are weighed into partial portions in a number of pans which are combined into batches with a give-away down to 0.25-0.7%. This is a remarkably high level of accuracy compared to solutions like batching based on the top-up principle.

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

*The Cabinplant Multibatcher is ideal for weighing and batching of large portions of meat and poultry, increasing throughput, reducing give-away and labour costs significantly.*

- The Multibatcher provides significant savings. The give-away can be reduced with up to 2000 lbs of meat on a daily basis for a processing line running two shifts and based on 3.5 oz or less give-away per portion, says Michael Falck Schmidt, Sales Director at Cabinplant.

**www.cabinplant.com**

IPPE Hall C Booth - 13133

# DIGITAL SOLUTIONS FOR HIGHER GROWTH

Digital solutions for higher growth will be some of the highlights of the CSB-System C12364 booth at IPPE in Atlanta. The IT specialist will showcase its ERP solutions in the meat and poultry sector that enables companies to continuously improve the efficiencies of their business processes and resources.

A team of experts will be on site to guide the visitors through CSB software system and answer any questions that may appear. Moreover visitors can also catch CSB at the IPPE Tech Talks on Tuesday, Jan 25th from 11:30 to 11:50 at Booth B8579, with a presentation on "How leading food manufacturers utilize digitization for higher growth."

CSB System is the leading industry specialist for ERP and Business Integration systems for the process industries of food & beverages with focus on the meat & protein industry. As a one-stop provider of software, hardware, services and business consulting, CSB optimizes the business processes of their customers and create significant competitive advantages with their CSB turnkey solution.

**www.csb.com**

IPPE **Hall C Booth - 12364**

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IPPE **Booth - BC9833**

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# EFFICIENT PROCESSES, CONSISTENT HIGH QUALITY: BETTCHER TRIMMERS SIMPLIFY MEAT PROCESSING AT EDEKA SÜDWEST FLEISCH

A systematic focus on traditional butcher's craft despite the growing use of automation - this is EDEKA Südwest Fleisch's recipe for success. In the artisanal processing of ham, pork loin and more, the company relies on the innovative Quantum Flex X1000 trimmer from Bettcher. At first glance, these are small, inconspicuous production helpers, but they have a big impact on daily operations. They ensure efficient workflows in meat processing and lead to consistent product quality that boosts the bottom line. EDEKA Südwest Fleisch is a wholly owned subsidiary of EDEKA Südwest, EDEKA SUPERMARKETS second largest regional company. In the new plant, built in 2011 in Rheinstetten near Karlsruhe, Germany, around 250 tonnes of meat are processed every day using state-of-the-art production methods to produce high-quality meat and deli cold cuts for the service counters and self-service areas of over 1,100 EDEKA supermarkets. Among the approximately 1,200 employees of the company there are more than 80 master butchers. Products produced in Rheinstetten include the 'Gutfleisch' label with its range of specialities, as well as organic products and the 'Hofglück' label, which stands for greater animal welfare.

The product portfolio is enormous. The pork department alone offers a range of over 400 products, including 20 different cuts of the most highly prized meat. Highlights of the range include dry-aged premium beef products, which undergo an extended dry maturing process.

But whether pork or beef, and regardless of the type of product, all production lines at EDEKA Südwest Fleisch meet the high standards of traditional butchers' craftsmanship. Dirk Sailer, Deputy Head of Cutting at EDEKA Südwest Fleisch explains: "Here in the company, we speak of our passion for the butcher's craft. We make our products in the classic artisanal way. Meat is a natural product; every piece looks different and has to be treated a little differently. For this, the Bettcher trimmers are invaluable." And so, despite a certain level of

*New generation Quantum Flex Timmer X1000*

*Display of beef carcasses*

*Dirk Sailer,*
*Deputy Head of Cutting at EDEKA Südwest Fleisch*

automation, a large proportion of the processing in Rheinstetten is done by hand.

## Customisable Trimmers - Higher Yields

To ensure that all manual steps of the process are as efficient as possible, EDEKA Südwest Fleisch uses the innovative meat trimmers from Bettcher Industries Inc. To all appearances, these are small, inconspicuous tools – but they make all the difference.

Bettcher, with headquarters in Ohio/USA and a European head office in Dierikon/Switzerland, is the world's leading supplier of high-performance cutting and trimming tools for industrial applications. Bettcher's circular knives are easy to use and they maximise yields. Depending on the application, a different blade can be used to carve a few grams more out of each piece of meat, as Bettcher is happy to demonstrate to customers. This quickly pays off, especially for large companies like EDEKA Südwest Fleisch.

*Markus Jentner, International Sales Manager at Bettcher GmbH with the Quantum Flex X1400*

The meat processing company has been using these innovative tools since 2013 and has benefited from Bettcher's expert advice from the very beginning. For Bettcher there is no such thing as a standard application. The Bettcher experts - that's what the company calls its team of direct contacts, most of whom are highly trained butchers - come to the processing plant, inspect the applications, and subsequently suggest the optimal solution.

In 2019, EDEKA Südwest Fleisch replaced its existing equipment with the new generation Quantum Flex Timmer X1400. In this latest series, Bettcher has further optimised numerous features. The trimmers are 15 per cent lighter than previous models, they have exceptionally low vibration and are ergonomically shaped. All in all, this makes them even smoother to use and more operator friendly. Due to different handle sizes, thumb rests and other features, they can be individually adapted to an operator's hand. To adjust the cutting depth, a depth gauge can be added to the tool. A safety lever ensures that the tool comes to a standstill as soon as the fingers leave the handle. Blades are regularly sharpened with a steeling device, Edgemaster, which are designed to allow even non-professionals to handle them. The trimmers can be adapted to perfectly suit different products and applications by adjusting size and diameter of blades, angle of blades, settings of cutting depth and motor speed. Overall, they maximise efficiency while minimising the effort required to achieve this.

One special feature of the new Quantum Flex Trimmer X1000 was of particular benefit to EDEKA Südwest Fleisch: the trimmer handpieces can easily be combined with any Bettcher motor. Markus Jentner, International Sales Manager at Bettcher GmbH comments: "For our part, we are working on making the tools more and more sustainable. EDEKA Südwest Fleisch, for example, only uses the new electrically powered trimmers, which require significantly less energy than tools powered by compressed air. And here, as in many other businesses, they still work with the first generation of Bettcher motors. To make our products particularly long-lasting, we have ensured that our new handpieces can be operated with all Bettcher motors, no matter how old they are. This is also a contribution to more sustainability."

## Uniform Defatting Leads to Reliable High Quality

*The Quantum Flex X1400 removes rind residues and trims the meat to make it as lean as possible*

The meat processing company deploys these exceptional trimmers on a line that produces raw goods and dispatch goods for cooked ham. The Quantum Flex X1400 removes rind residues and trims the meat to make it as lean as possible. The tools are also used for the trimming of highly prized cuts of meat: pork loins are evenly defatted right down to the silver skin. To achieve this, the round

knives are pulled flat over the meat, ensuring an even cut which results in highly uniform products that perfectly meet EDEKA Südwest Fleisch's concept of quality.

With the opening of the Rheinstetten plant, the cutting process, which was briefly outsourced, is once again entirely in the hands of EDEKA Südwest Fleisch. This allows the company to enforce high standards of quality control over incoming goods as well as production processes. The artisanal nature of the work can be carried out according to the company's own standards, and Bettcher trimmers play a central role in maintaining these.

## Ergonomic Design Eases the Work

A significant benefit of Bettcher trimmers is their ease of use: even inexperienced or unskilled employees can work with the device after a brief introduction. Handling the circular knives is much easier to learn than using a conventional knife. At the same time, the ergonomic design ensures less operator fatigue which, in turn, leads to substantial increases in yield. At the processing plant, for example, one employee processes about 300 pieces of ham per hour using the trimmer. The plant estimates that it would take three employees to achieve the same result when using conventional knives. And so, in addition to ease of use, the advantageous ergonomics of the tools were also among the criteria for EDEKA Südwest Fleisch's decision to use the Bettcher trimmer.

*Ergonomic tools - the Quantum Flex X1400 trimmer are designed to make work easier*

Right from the start, when the modern factory in Rheinstetten was built, attention was paid to improved working conditions in order to counteract the lack of qualified personnel. Instead of standing on a cold floor, workers stand on height-adjustable platforms. Ergonomic tools such as the Quantum Flex X1400 trimmer are designed to make their work easier. Plant managers at Rheinstetten are therefore pleased to report another effect that the use of this equipment has had: sick leave has been greatly reduced.

Thanks to the high level of satisfaction with the Quantum Flex X1400, combined with the expert advisory services provided by Bettcher's team of trained butchers and their fast trouble-shooting response times, EDEKA Südwest Fleisch continues to build a close partnership with Bettcher. It allows the meat processing company to exceed customer expectations by providing products of first-class quality.

**www.bettcher.com**

# MEAT PRODUCTION AND CONSUMPTION IN 2030 - A PROJECTION -

By Prof. Dr. Hans - Wilhelm Windhorst

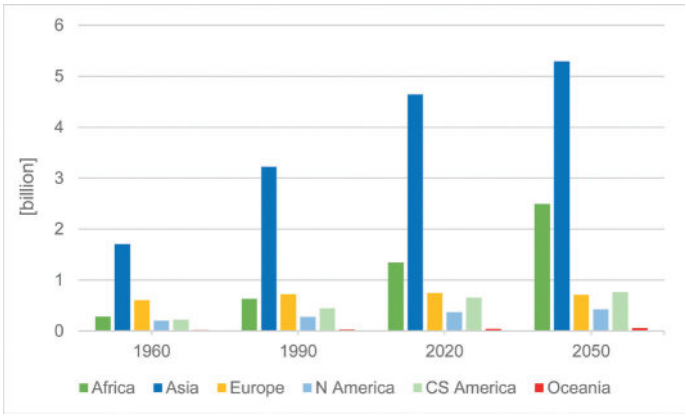
The challenge of food security for a growing global population has gained in importance in science as well as in political decision-making. The increasing demand for feed in animal production, the high energy and water consumption as well as the greenhouse gas emission have been criticised heavily. A new point of discussion is, if the new technologies to produce plant-based meat substitutes or cell cultured meat can contribute to a reduction of resource consumption and negative environmental impacts and at the same time add to food security.[1] This paper presents a projection of the development of meat production and meat consumption between 2020 and 2030. Long-term projections until 2050 are still very hypothetical and will only be discussed in a short overview at the end of the analysis.

## The Challenge of a Continuously Growing Global Population

The development of the global population and the changing social and economic conditions will be decisive for the future food demand. The increasing per capita consumption of a growing middle class with an increasing purchasing power in many threshold and developing countries will result in a higher meat consumption (FAO 2009, 2012; UN 2009).

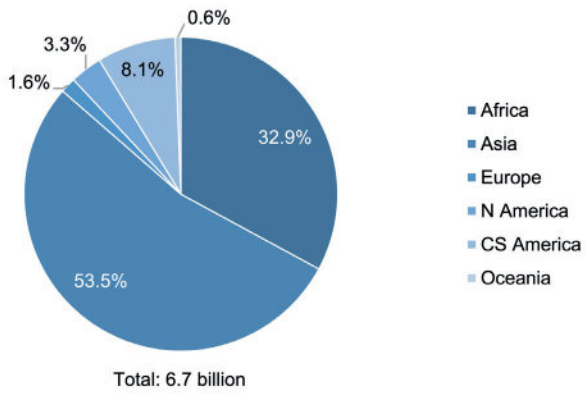
Between 1960 and 2020, the global population grew from 3.0 to 7.8 billion or by 157 %. Until 2050, another increase of 2 billion is expected. To this Africa will contribute 1.1 billion, Asia 650 million and Central and South America 110 million. Most of the threshold and developing countries are located in these three continents, which impressively reveals the problem of food security (Figure 1). Figure 2 documents impressively the regional concentration of the population growth dynamics. Asia and Africa will together share 86.4 % in the expected population increase until 2050. In the following three decades, food security will be the decisive challenge. If a higher food

*Figure 1:*




*The development of the global population between 1960 and 2050 at continent level*
*(Design: A. S. Kauer, based on UN World Population Prospects 2019)*

*Figure 2:*




*The share of the continents in the projected global population growth between 1960 and 2050*
*(Design: A. S. Kauer, based on UN World Population Prospects 2019)*

[1] The author has published some basic papers on this topic: Windhorst 2019, 2020, 2021.

| Continent | 1961 | 2019 | Increase | | Share (%) in the global increase |
|---|---|---|---|---|---|
| | | | absolute | % | |
| Africa | 3,907.7 | 20,713.8 | 16,804.1 | 429.8 | 6.3 |
| Asia | 9,046.0 | 135,538.0 | 126,492.0 | 1,398.3 | 39.3 |
| Europe | 30,004.1 | 64,292.3 | 34,228.2 | 114.3 | 15.6 |
| N America | 17,991.8 | 53,222.8 | 35,231.0 | 195.8 | 17.0 |
| CS America | 8,109.6 | 56,017.2 | 47,907.6 | 591.2 | 21.8 |
| Oceania | 2,396.9 | 6,855.3 | 4,585.4 | 198.5 | 1.2 |
| World | 71,357.1 | 336,639.4 | 265,308.3 | 371.8 | 100.0 |

*Table 1: The development of global meat production between 1961 and 2019 at continent level, data in 1,000 t (Source: FAO data)*

security cannot not be achieved increasing famines and a migration of undernourished people to countries with a food surplus may be inevitable.

## The Past Dynamics in Retrospect

A short retrospect in the dynamics of meat and egg production between 1961 and 2019 will be given, to better understand the following analysis. Table 1 shows that in the analysed time period global meat production increased by 265.3 mill. t or by 371.8 %. The absolute and relative growth rates differed considerably between continents. The highest absolute increase showed Asia with 126.5 mill. t, followed by Central and South America. The increase in Europe and North America was very similar. The lowest relative increase showed Europe with only 114.3 %, Asia the highest with 1,298.3 %. Even though production in Africa grew fivefold, the continent only contributed 6.3 % to the global increase. Asia was in a dominating position with a share of 39.3 %, followed by Central and South America with 21.8 %.

A closer look at the dynamics at the level of meat types reveals the remarkable development for poultry meat (Table 2). It showed the fastest growth. It is worth noting that egg production increased much faster than that of cattle meat and that in 2019 the volume of produced eggs was 15 mill. t higher than that of cattle meat. The lack of religious barriers and the favourable feed-conversion rates of broilers and laying hens, which resulted in lower production costs, were the main steering factors behind this success story.

## Considerable Differences in the Population Development Until 2030

According to the UN Population Prospects 2019, the global population will increase by 754 million persons between 2020 and 2030 and reach a value of 8.5 billion. Africa will share 348 mill. in the absolute growth, Asia 330 mill. Together the two

| Product | 1961 | 2019 | Increase | |
|---|---|---|---|---|
| | | | absolute | % |
| Cattle meat | 27,709 | 68,314 | 40,605 | 146.8 |
| Pig meat | 24,747 | 110,110 | 85,363 | 344.9 |
| Poultry meat | 8,943 | 131,647 | 122,698 | 1,371.0 |
| Eggs | 14,383 | 83,484 | 69,101 | 481.5 |

*Table 2: The development of global meat and egg production between 1961 and 2019, data in 1,000 t (Source: FAO data)*

| Continent | 2020 | 2030 | Change | | Share (%) in the global growth |
|---|---|---|---|---|---|
| | | | absolute | % | |
| Africa | 1,340.6 | 1,688.3 | 347.7 | 25.9 | 45.9 |
| Asia | 4,641.1 | 4,974.1 | 330.0 | 7.2 | 43.6 |
| Europe | 747.6 | 741.3 | - 6.3 | - 0.8 | - |
| N America | 368.9 | 390.6 | 21.7 | 5.9 | 2.9 |
| CS America | 654.0 | 706.3 | 52.3 | 16.3 | 6.9 |
| Oceania | 42.7 | 47.9 | 5.2 | 12.2 | 0.7 |
| World | 7,794.8 | 8,548.5 | 753.7 | 9.7 | 100.0 |

*Table 3: Projected global population growth between 2020 and 2030 at continent level, data in million persons (Source: UN World Population Prospects 2019)*

continent will contribute 89.5 % to the global population increase (Figure 1 and Figure 2). Only in Europe, the population will decline in the coming decade (Table 3).

## Future Dynamical Development in Poultry Meat Production Expected

Projections of the development in global meat production are available in the OECD-FAO Agricultural Outlook 2021 - 2030 and in the International Long-Term Projections of the U. S. Department of Agriculture (USDA). The data differ in particular for cattle and poultry meat. In this analysis, USDA data are used. The USDA projects an increase in the production volume of the three most important meat types from 302.5 mill. t to 364.2 mill. t or by 20.5 % in the analysed decade. The highest absolute growth with 27.8 mill. t is expected for poultry meat, followed by 25.6 mill. t for pig meat. In contrast, cattle meat is projected to increase by only 8.5 mill. t. The gap between the production volume of poultry meat and that of the other two meat types will become wider (Table 4). It is worth noting that the USDA projects a growth of the per capita consumption of pig meat from 13.3 kg to 15.1 kg in the analysed time-period. For poultry meat, an increase of also 1.8 kg to then 18.2 kg is expected. The per capita consumption of cattle meat will increase only moderately by 0.2 kg and reach 9.3 kg in 2030. A growth of pig meat consumption is expected in Asia and Central and South America, while it is assumed that it will stagnate or even decrease in Europe and North America.

Tables 5 to 7 document in detail the projected development at country level for the three meat types.

A comparison of the composition and ranking of the countries in the three tables reveals impressively the importance of Asia and the American double continent

| Meat type | 2020 | 2030 | Increase | | Share (%) in the global increase |
|---|---|---|---|---|---|
| | | | absolute | % | |
| Cattle meat | 70,874 | 79,378 | 8,504 | 12.0 | 13.7 |
| Pig meat | 103,824 | 129,379 | 25,555 | 24.6 | 41.3 |
| Poultry meat* | 127,800 | 155,634 | 27,834 | 21.8 | 45.0 |
| Gesamt | 302,498 | 364,391 | 61,893 | 20.5 | 100.0 |

*Table 4: Projected development of global meat production between 2020 and 2030 by meat type, data in 1,000 t*
** only broiler and turkey meat*
*(Source: USDA International Long-Term Projections to 2030)*

| Country | 2020 | 2030 | Change | | Share (%) in the global increase |
|---|---|---|---|---|---|
| | | | absolute | % | |
| USA | 12,374 | 13,305 | 931 | 7.5 | 10.9 |
| Brazil | 10,100 | 12,497 | 2,397 | 23.7 | 28.2 |
| China | 6,780 | 7,805 | 1,025 | 15.1 | 12.0 |
| EU | 7,800 | 7,552 | - 248 | - 3.2 | - |
| India | 3,650 | 4,350 | 700 | 19.2 | 8.3 |
| Mexico | 2,090 | 2,308 | 218 | 10.4 | 2.6 |
| 6 countries | 42,794 | 47,817 | 5,023 | 11.7 | *61.9 |

*Table 5: Projected increase of cattle meat production in selected countries between 2020 and 2030; data in 1,000 t*
** sum does not add because of rounding*
*(Source: USDA International Long-Term Projections to 2030)*

| Country | 2020 | 2030 | Increase | | Share (%) in the global increase |
|---|---|---|---|---|---|
| | | | absolute | % | |
| China | 38,000 | 54,871 | 16,871 | 44.4 | 66.0 |
| EU | 24,000 | 25,647 | 1,647 | 6.9 | 6.4 |
| USA | 12,778 | 13,729 | 951 | 7.4 | 3.7 |
| Brazil | 4,125 | 5,225 | 1,100 | 26.7 | 4.3 |
| Russia | 3,520 | 4,114 | 594 | 16.9 | 2.3 |
| Canada | 2,110 | 2,391 | 281 | 13.3 | 1.1 |
| Philippines | 1,275 | 1,924 | 649 | 50.9 | 2.5 |
| Mexico | 1,460 | 1,871 | 411 | 28.2 | 1.6 |
| 8 countries | 87,268 | 109,772 | 22,504 | 25.8 | 87.9 |

*Table 6: Projected increase of pig meat production in selected countries between 2020 and 2030; data in 1,000 t*
*(Source: USDA International Long-Term Projections to 2030)*

in the projected dynamical development of meat production. China, Brazil, India and the USA will play a dominant role in the dynamics of poultry meat. The lower regional concentration in contrast to the other two meat types, the ten listed countries will only contribute 64.1 % to the global growth, shows that also in other countries production will increase. The highest regional concentration will be reached in pig meat. Here, the eight listed countries will share 87.9 % in the projected global growth. With a contribution of 61.9 % by the five listed countries in the global increase, a high regional concentration is also projected for cattle meat. Brazil is on its way to replace the USA as the leading producing country. For Europe, a decrease of the production volume by 250,000 t is expected.

| Country | 2020 | 2030 | Increase | | Share (%) in the global increase |
|---|---|---|---|---|---|
| | | | absolute | % | |
| USA | 22,866 | 25,495 | 2,629 | 11.5 | 9.4 |
| China | 14,850 | 19,083 | 4,233 | 28.5 | 15.2 |
| Brazil | 14,530 | 17,701 | 3,171 | 21.8 | 11.4 |
| EU | 16,238 | 17,298 | 1,060 | 6.5 | 3.8 |
| India | 4,000 | 6,810 | 2,810 | 70.3 | 10.1 |
| Russia | 4,715 | 5,248 | 533 | 11.3 | 1.9 |
| Mexico | 3,716 | 4,505 | 789 | 21.2 | 2.8 |
| Thailand | 3,250 | 4,308 | 1,058 | 32.6 | 3.8 |
| Indonesia | 2,653 | 3,555 | 902 | 34.0 | 3.2 |
| Iran | 2,446 | 3,143 | 697 | 28.5 | 2.5 |
| 10 countries | 89,264 | 107,146 | 17,882 | 20.0 | 64.1 |

*Table 7: Projected increase of cattle meat production in selected countries between 2020 and 2030; data in 1,000 t (Source: USDA International Long-Term Projections to 2030)*

## Which Will be the Impacts on Feed Production?

Presently, about two thirds of the globally available arable land are used for animal feed production. When the production volume of the three most important meat types will grow by 20.5 % until 2030, as projected, the question is, if sufficient arable land will be available for the additional demand. In its long-term projections, the USDA estimates that between 2020 and 2030 the needed corn harvest used for feed production will grow by 25 %, by 22 % for soybeans and by 26 % for wheat. Only for barley and other feed grains, lower growth rates are projected (Table 8).

As the production volumes of corn, soybeans and wheat will grow considerably slower than the additional demand for feed production, the consequence will be a shortage or at least an increase of the world market prices for feed. The projected growth in the yields per hectare will not be able to compensate for the additional demand.

| Crop | Change (absolute) | Change (%) |
|---|---|---|
| **Harvested area (mill. ha)** | | |
| Wheat | 3.6 | 1.6 |
| Corn | 14.7 | 7.5 |
| Soybeans | 18.9 | 14.8 |
| Barley | - 0.3 | - 0.6 |
| Sorghum | 4.4 | 10.6 |
| **Production (mill. t)** | | |
| Wheat | 63.6 | 8.2 |
| Corn | 231.1 | 19.9 |
| Soybeans | 98.6 | 26.8 |
| Barley | 8.4 | 5.4 |
| Sorghum | 9.0 | 14.7 |
| **Used for feed (mill. t)** | | |
| Wheat | 34.8 | 25.9 |
| Corn | 183.0 | 25.0 |
| Soybeans | 79.8 | 22.0 |
| Barley | 8.0 | 7.3 |
| Sorghum | 1.5 | 6.7 |

*Table 8: Changes in the harvested cropland, production and the share needed for feed production for selected crops between 2020 and 2030 (Source: USDA International Long-Term Projections to 2030)*

## Perspectives

The preceding analysis, which focused on the decade between 2020 and 2030, showed that according to the USDA Long-Term Projections global meat production will increase by about 63 mill. t or by 20.5 %. More than 53 mill. t will be contributed by poultry and. Cattle meat production will grow much slower. The dynamics in cattle meat is, however, less important for the future feed demand as only a small part of the cattle is fattened in feedlots. It

is obvious that the share needed for feed production will grow faster than the production of corn, wheat and barley. Soybean and Sorghum harvests, in contrast, will grow faster than the projected additional demand. It may also be possible, however, that the soybean production in South America will increase less than projected because of environmental problems in the Amazonas biome and climate change.

When assuming that in the present decade the global population will grow by another 1.2 billion people or by 14 %, the demand for the three most important meat types will increase by 440 to 470 mill. t. It could even grow much faster, if the meat consumption in some threshold and developing countries with a high population would increase considerably. A demand of more than 500 mill. t could be possible. Then it would no longer be possible to produce the additional feed demand on the available arable land. The new technologies in plant-based or cultured meat production might be able to contribute to food security. When products in market quality and amount will be available to reduce the gap between conventional production and demand, is a still an open question. Very optimist projections (A. T. Kearney 2019, Rethink 2019) are in contrast to more realistic estimates (Boston Consulting 2021, van der Weel 2019, Hansen 2021, Roland Berger 2021, Rabobank 2021).

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# MAXIMIZING YIELD AND QUALITY IN POULTRY MEAT PRODUCTION

Polish company Starmeat invests in leading-edge meat separation systems AM2C Beluga and Barracuda from Provisur Technologies

Starmeat, headquartered in Koluszki, Poland, is one of the most modern poultry processing plants in the world. Thanks to the use of sophisticated production equipment and rigorous quality control, the company serves a global network of customers. The state-of-the-art production facility and the exceptional quality of Starmeat products are made possible by the company's partnership with Provisur Technologies, a pioneering food processing equipment manufacturer headquartered in Chicago, USA. Since integrating Provisur's AM2C Beluga and Barracuda separation systems into its processing lines, Starmeat has gone from strength to strength, increasing yield and maximizing quality.

*Starmeat, headquartered in Koluszki, Poland*

## Based in Poland - Worldwide Market

Starmeat was founded in 2010 and has specialized in the production of poultry meat since 2013. In 2018 the company began looking for design solutions and technological innovations for a new meat processing plant. This quickly led to a collaboration with Provisur Technologies in the knowledge that Provisur equipment would offer the necessary combination of innovation, high performance and exceptional hygiene. Construction began in 2019 on what is to date the most advanced minced meat and meat-cutting production facility in Poland. At the end of 2020 production commenced, enabling Starmeat to produce 200 tonnes of high-quality meat per day.

*Feeding system to AM2C Beluga or Barracuda*

Known for their outstanding quality, Starmeat deliver their products to domestic and international meat processing plants as well as international meat trading companies. These channels are responsible for over 80% of the volume sold. The remaining 20% are customers in the pet food industry as well as poultry meat commercial companies. Mechanically separated poultry makes up the

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largest share of production for sausages, pates, nuggets, kebabs and delicatessen products.

## A Collaboration Built on Excellence

When Starmeat began to think about constructing a new production plant, the company was dealing with two challenges:

The first of these is the ongoing dynamic development of the poultry sector. As the only segment of the meat industry with increasing consumption, poultry meat production has an average annual growth rate of 7%. Any new equipment would have to keep pace with these developments and allow Starmeat to meet the increase in demand.

Secondly, maintaining quality and safety despite the increase in production is of paramount importance to a company whose motto is: "Quality is our advantage." Starmeat uses only the highest quality domestic poultry which then undergoes a series of checks at all stages of its production. Ideally, the new production equipment should not only preserve this level of excellence but raise it even further.

When designing the new plant, it was therefore clear that only the most modern meat processing systems, metal detectors and meat analysers would do the job. Additionally, it would be necessary to constantly monitor parameters such as water, fat, protein and calcium whilst maintaining speed, maximum yield and flexibility.

Provisur became Starmeat's partner of choice due to its global reputation as one of the most innovative meat separation

*Provisur Technologies meat separation systems*

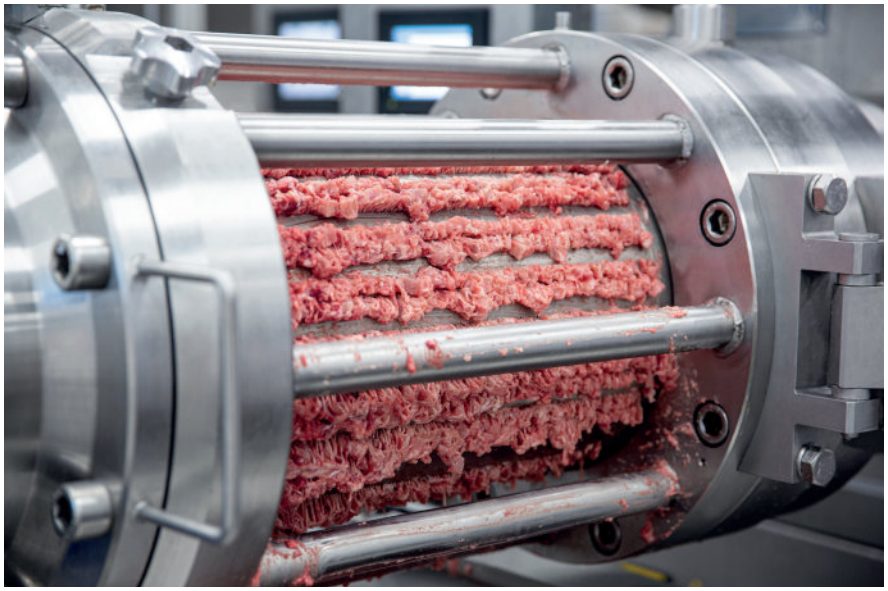
systems manufacturers in the world. Based on years of experience, as well as technological excellence, the solutions offered by Provisur focus on those requirements that are crucial to Starmeat.

## Advanced Technology: Reliable, Safe, Easy to Use

It was therefore decided that Provisur's Beluga and Barracuda meat separation systems would be integrated into the Starmeat production lines.

The Beluga system offers the best deboning and desinewing technology currently on the market and provides a comprehensive solution to the demands of the Starmeat production line. It protects the raw material through a, minimal temperature rise.

*Advanced separation technology with a low RPM, single screw feed system, for the gentle handling of raw material*



*The modular design accommodates a wide variety of both slotted and holed filter chambers*

It provides important product consistency, high-quality textures and low calcium levels of less than 1000 ppm.

With the Barracuda system, Provisur has created a new standard in meat separating technology. It is a modular system that offers almost unlimited configuration flexibility to accommodate specific applications. The high-pressure system works with a vane pump which is designed to pump bone waste, mechanically separate meat, and products that are fluid in nature.

Both systems are simple to use and easy to clean and maintain, resulting in advanced food safety and hygiene. Importantly for Starmeat, the systems' inbuilt flexibility means they are also easy to integrate into existing production lines. Furthermore, both systems offer simple and smooth adjustments when future changes become necessary.


*Daniel Katowicz and Henryk Ignatowicz, owner of Starmeat*

## Window to the Future: Quality Meets Sustainability

For a company like Starmeat, the greatest benefit of working with Provisur systems has been the improvement in product quality. Another advantage offered by Provisur is superior customer service and fast reaction times. When emergencies arise Starmeat has been able to call on Provisur offices in Poland and France to provide reliable and speedy support.

As a result of their first successful collaboration, Starmeat is already thinking about further investments. "Despite the fact that only a year has passed since we launched one of the most modern poultry processing plants in the world, we are already thinking about the future," says Daniel Katowicz, CEO of Starmeat. "We are developing another range of products and look forward to creating it in tandem with the expertise and experience of the Provisur team."

The Polish poultry sector is growing stronger all the time. Both this and the EU Green Deal development strategy will have a very significant impact on Starmeat's future business. Daniel Katowicz explains: "This means that together with Provisur we will also look closely at finding new, innovative production solutions based on environmental sustainability."

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# THE ARRIVAL OF CELL-CULTURED MEAT

**By Henk Hoogenkamp** **part 2**

## Biomedical Expertise

The ongoing challenges include finding better cell lines and nutrient media to feed those cells, scaffolding systems to shape the cells into tissue meat, as well as building bioreactors for large-scale production of meat that is eco-friendly and ethically sound.

Cultured meat development is complex. It crosses many scientific and technological disciplines such as biomedical applications and hardware engineering -which, when combined, will ultimately create a new field of scientific expertise. Scaffolds need to be designed to be able to grow combinations of different types of animal cells to simulate the marbling of fat as well as the connective tissue.

Scaffolds provide a support structure for cellular adherence and develop (if needed) into the various component cells of the integral meat composition. Scaffolds can be seen as netting (e.g., made from soy protein), which allows the cells to multiply and intertwine until a certain predetermined shape has been formed. Then, there are also developments to create plant-based microcarriers that will enable tiny particles, to which the cells attach while suspended in the media. For example, such a system can successfully grow a hotdog.

## Stem Cell & Gene Therapy: Regenerative

- Grown from animal cell in culture
- Cell proliferation in a bioreactor to grow and multiply
- Cells regenerate with external support like oxygen and nutrient-rich broth
- This process is followed by scaffolding
- Undifferentiated stem cells become different types of tissues
- The muscle-forming cells will join in long chains -> myotubes that will start contracting spontaneously at some point

## Meat Biomanufacturing

Technology advancement now makes it possible to culture meat without animal serum. For example, bovine identical serum can be synthesized. Cells can now be cultured in bioreactors using animal component-free growth media. For example, removing Fetal Bovine Serum (FBS) from the growth medium is a great step forward in bringing down the production costs and ultimately helping achieve price parity with conventional animal-raised meat. The latter is especially true for beef.

Mosa Meat (Netherlands) and Upside Foods (USA), as well as other startups have made major process improvements by significantly reducing the cost of the growth medium to enable large output quantities of cultured meat. Specifically, the removal of Fetal Bovine Serum: a substance, which is not only expensive, but also ethically and morally controversial, because it is taken from the blood of pregnant dairy cows during slaughter.

## Growth Media

The key growth medium "broth" ingredients are salts, sugars, and proteins. An often-neglected part in the many publications and articles of cultured meat and fish is the importance of buffer and trace elements as essential nutrients. To secure the biotechnological performance nutritious minerals for upstream and functional salts for downstream processes are needed. These bioprocessing salts need high solubility and the absence or low heavy metals and endotoxins. As the cultured meat- and fish industry is maturing into a self-supporting business model, special blended functional salt

premixes will be made commercially available, including Kosher and Halal certified.

The protein components are made from recombinant microbial systems, expressing proteins in microbes such as fungus, yeasts, and bacteria. Stabilizing the cell lines and culturing in suspension, while optimizing the proliferation -or speed of multiplying, are all important processing steps.

## Fat is Key

Fat is where much of the distinctive flavor of meat resides. In addition, meat's flavor also comes from the breakdown of collagen. Therefore, it will be necessary to cultivate different types of cells to truly simulate the desired meat flavor profiles. Cultured fat –under development by a.o. Mosa Meat, Perfect Day Foods, and Cubiq- is made using different types of fat starting from stem cells with no GMO material used. These companies are known for their clean fats created using cell culture systems. It can be argued that the inclusion of cultured fat will be cost prohibitive, especially in products that traditionally contain a high fat level such as the beef burger. Burgers typically have approximately 20 percent fat and that might be a too high level for cultured beef fat, even though the flavor attributes improve considerably. Subsequently, it is likely that at much smaller inclusion levels, the cultured beef fat to be infused with natural spices and flavors. Expect the flavor companies to develop a range of "flavor-infused" cultured fat products.

*Carving up 3D - printed plant-based New-Meat.*

## 3D Cellular Agriculture Technology

Meat in the shape and form of muscle appearance is probably the most complex food product that exists. Not only in its raw form, but certainly also its transition during cooking, creating complex sensorial parameters delivering much-preferred eating experiences. As for cultured meat, it is far more difficult to create a perfect whole-muscle beef steak than a simple finely ground hamburger. Crucial to creating a cultured whole muscle steak is the use of multi-material 3D printing technology allowing multiple different meat, connective tissue, and fat cells to be layered in one single simultaneously process. This technology needs to uniquely allow to fully replicate texture and mouthfeel for cuts such as sirloin and rib-eye steaks.

A fully 3D structure, like a conventional beef steak or salmon loin, is now within reach for cell-cultured products. Not only providing the whole muscle looks and the true texture and structure, but also the shape, flavor and cutting properties when eating these tasty and nutritious delights.

For 3D cultured products the challenge is to create the right nutrients and combination that allows the multicellular matrix to grow and appear together in harmony, creating a traditional structure. The tools needed are a strong bio-engineering platform, an animal-free growth medium to nourish the cells and bioreactors to grow the tissue. Many of these tools have been previously developed by the medical world using bio-tissue engineering and the help of scaffolds for medical organ transplantation.

It looks like 3D manufacturing technology called stereolithography will be a possible contender to create a specific structure of muscle and fat marbling and texture of a "real" structured beef steak. 3D printing is well on its way to become the choice for prototyping or a structured endeavor, enabling much unprecedented fast development time at significantly less costs.

3D technology has now entered the cultured or clean meat vocabulary and it specifically allows combining all the cells that make up traditional meat simultaneously –the muscle fibers, the fat, the blood vessels, and connective tissues (collagen). Blood vessels have an important role to play in replicating the structure of the grown meat, which impacts its texture. Using the four different cell types found in traditional cuts of meat creates a holistically grown three-dimensional meat product that is

more identical to the meat that people recognize and crave for.

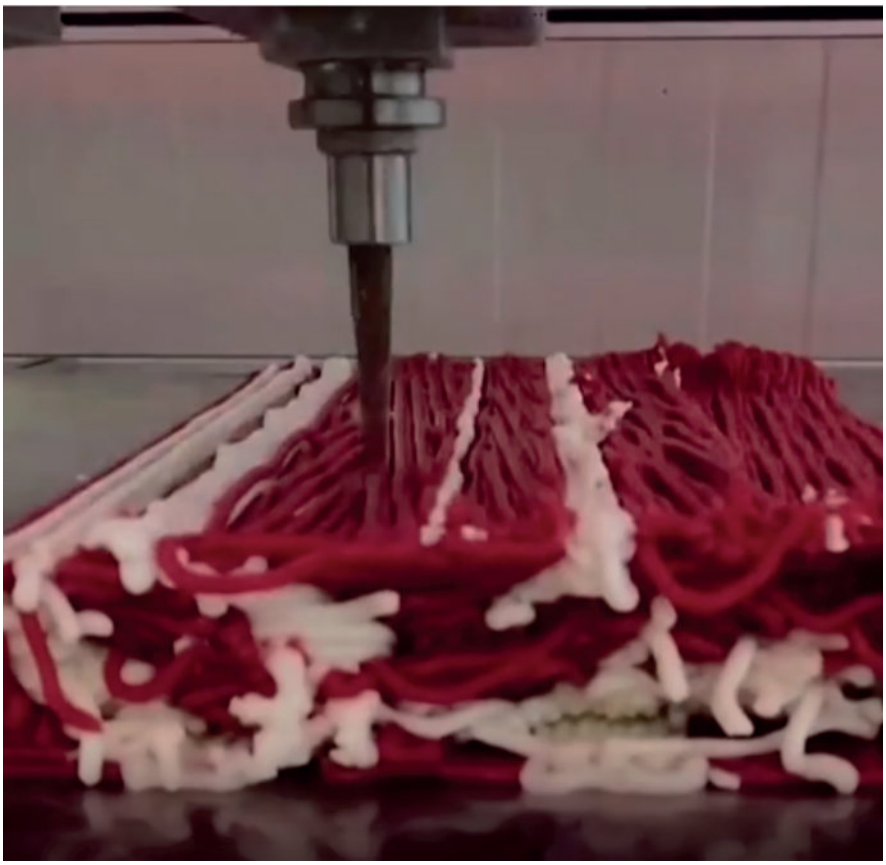
## Regulatory Hurdles

Although both Singapore and Israel have already given regulatory approval for the consumption of cell-based meat and fish, the industry still faces major challenges in regulatory approval in the US and EU. The US FDA will mainly oversee the procurement of cell-collecting systems and cell culturing technology, while the USDA FSIS will be responsible processing and labeling of the products from the harvested cell-based meat products.

A major and still unresolved challenge facing the cultured meat industry in most countries, is the lack of government regulative framework. Except for Singapore and Israel, no jurisdiction has yet approved cultured meat to be released for human consumption. This is mainly because legislative approval in any jurisdiction will likely be slowed down by the lack of detailed safety data from large-scale consumer consumption, as well as the opposition from the traditional meat industry and outgrow farmers. Proactive regulatory action is needed now that cultured meat is nearing market introduction in the US and the EU. A clarifying regulatory pathway needs to be agreed upon between the USDA-FSIS and the FDA, as well as rulemaking by EFSA. In the US, rulemaking including labeling requirements of cell-based meat products reportedly is imminent.

## Labeling Name Calling

Although in the early days of "alt-meat" many name suggestions where floated in articles and publications, it is likely that within the US USDA there is now consensus to choose either "cell-based meat" or "cell cultured meat" as the name of choice for consumer identification and recognition. The main rationale to choose one of these names is that the cultivated meat is made in a bioreactor. These names also help most consumers to understand that the new food products are produced in a different way from traditional slaughtered animals.



The EU landscape, unfortunately, is quite different from the US, Singapore, and Israel. Europe is rather conservative and cell cultivation ruling will need to go through the EU Novel Food Regulation Agency (EFSA), which in practical terms will likely be a major handicap to get these innovative foods to market quickly. Now that Brexit is firmly in place, the UK may well have regulatory approval in place before the EU makes their decision. Most probably, as China and Japan will have regulatory approval for cultivated meat before the EU does.

It is not an easy task for government regulators to adequately differentiate cell-cultured products from the traditional meat products. There are opposing views between the animal farming community and the cell-cultured disruptors. It is no surprise that animal farmers prefer keeping the monopoly of using the word "meat" so as not to confuse consumers with emerging biotechnology methods of assembling or growing a group of cells together in a bioreactor.

It will also be important to communicate via label disclosure

if growth support "additives" are used when producing cell-cultured foods. The consumer has the right to know, so that informed purchasing decisions can be made based on the presence or absence of various support or processing additives in cultured products. Whatever the regulatory outcome, it is important to acknowledge that scientific innovation and progress should not be stymied. If cultured meat products are organoleptic and nutritionally equivalent to their non-biotechnologically counterparts, the new wave food disruptors should not be required to any further hurdles of regulatory burden.


## The Marketing Dilemma

Sustainable food supply is a defining issue of the 21st Century, and that is the main reason why there currently is an emergence of alternative protein technologies creating innovative technologies to nutritionally feed a rapidly growing world population.

As frequently proven in the past, consumers are usually hesitant to embrace new technologies, which is also true for food products that are still on the drawing board. Most consumers have difficulty envisioning reality when they are not physically able to see and try the new product. Consumers are usually notoriously skeptical of food tinkering, especially when it is called "biotechnology". For cultured meat companies, it is therefore smart marketing strategy to take sufficient time to commercially introduce their products. Smart public relation efforts are key to engage the eco-consumer and share the advantages of the meat product which has always been deeply embedded in religion, socio-culture, and eating enjoyment.

The demand for a more sustainable food system is truly global and growing fast, with much of the shift being led by the sub-30-year age generation. However, when the new product that looks and tastes great, becomes commercially viable, consumers are likely to switch from old to new and start enjoying the meat product that can now be eaten without the environmental and animal welfare negative overhang.

Initially, cultured meat will cater to those consumers who prefer the texture and taste of conventional meat but do not want to think about the animal suffering and the environmental burden. Specifically, the younger generation -Gen Z consumers (born 1997-2015) are seen as the real decision-makers on whether cell agriculture is going to be a successful part of the global food industry. Already now, in a few countries, cultured meat is available to affluent consumers in select restaurants. However, cultured meat ultimately needs to achieve societal benefits not just fort he happy few, but for the entire global population.

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# CLEANING – A CHALLENGE FOR THE INDUSTRY

**By Lene Meinert and Anette Granly Koch**

Food safety provides companies with a licence to produce, and cleaning and disinfection are both crucial to achieve a high level of food safety. And yet today, cleaning in the food industry is performed as it has been for many decades without adapting to the changes in the production set-up that are taking place in the food industry.

There is, however, a general lack of innovation in cleaning technology. Every year, huge sums of money are lost in the food industry due to improper cleaning; for example, equipment is ruined due to the use of wrong chemicals, and equipment is not properly cleaned, resulting in delays in production start-up, etc.

## Cleaning – A Challenge for the Industry

With increasing production time and the potential for producing 24/7, less and less time is being set aside for cleaning. The environmental footprint from the meat production process, including the cleaning procedures, must be reduced in such a way that the cleaning is performed using fewer chemicals and less water, while ensuring the same high level of food safety as before. This presents the industry with a considerable challenge. The entire value chain, including producers of cleaning formulations, producers of production line equipment, food producers, cleaning companies, the cleaning operator on the floor during night hours, and many others, must collaborate on finding the cleaning solutions of tomorrow. However, the greatest challenge lies in attracting young talent. Currently, there is no prestige in working in industrial cleaning, since it is not recognised as a skilled trade.


## When is Clean Clean Enough?

This is the fundamental question and the basis of all the changes that need to be made to the traditional cleaning methods of today. These changes are inevitable and must be tested thoroughly to achieve a high level of food safety. The food producers also need to ensure that the level of cleanliness meets customer demands and the guidelines given by the authorities.

## Traditional Cleaning and Disinfection

The cleaning procedure in the food industry generally follows

the same sequence: 1) preparation of equipment for cleaning, 2) initial rinsing/scrubbing, 3) detergent application), 4) rinsing, 5) disinfection application (e.g. foam), 6) rinsing and 7) drying. The level of cleanliness can be determined using the following simple equation:

**Cleanliness = Chemicals (Cleaning Formulations) + Temperature + Time + Mechanical Actions**

If one of the four parameters is reduced, for example "time", then one or more of the other parameters must be increased to achieve the same level of cleanliness. This clearly illustrates the scale of the challenge at hand.

## IDEAS FOR CLEANING 2.0

### Cleaning During Production – Short Cut to Longer Production Hours?

Is it possible to produce for a longer period of time between the cleaning procedures in order to reduce the number of production stops? Is it possible to skip one or more of the traditional steps in the cleaning programme or do something completely different from what we do today? There are solutions and ideas with the potential to reduce the amount of water and chemicals used for cleaning. At DMRI, we are continuously looking into some of the potential solutions to reduce time used on cleaning and to increase the production time.

In an ideal world, all equipment would be built according to the principles of hygienic design, making it easy to clean. However, this is not always the case in the real world, so care must be taken to clean, for example, hidden areas in the equipment. Cleaning during production also requires the use of suitable cleaning agents that do not pose a contamination risk to the products.

### Producing for 18 Hours Without Cleaning

We performed a study in the meat industry in which 15 different production lines were tested for microbial count and visual appearance over a period of 18 hours. The production lines varied from the slaughter line to the slicing of cooked ham. No increase in microbial count was detected on any of the 15 lines during the 18-hour production period. The microbial load on the lines reflected the products being handled.

If product residues of cooked products accumulate in small recesses in the equipment, will this promote the growth of pathogens?

Occasionally, small amounts of potentially contaminated meat residues fall onto the product. We performed a series of challenge tests where fresh meat or cured and heated meat products were inoculated with different bacteria. The study showed that the lag phase varied between one and eight hours at 12°C room temperature. The occurrence of growth is highly dependent on the product (pH and preservation, etc.) and the temperature in the equipment and production area. It was concluded that the production time for cooked products can be extended but that cleaning during production is essential. Otherwise, the shelf life of the products may be compromised.

### Disinfection Cloths/Wipes

Wiping surfaces that are in direct contact with products is a known and effective way of performing cleaning during production. The question, however, is whether wipes with water are as effective as wipes with ethanol. Also, is there any difference between a commercial ready-to-use product (wet wipe) and a fibre cloth that is prepared before use?

We tested the different cloths/wipes by wiping the surface of a smooth conveyor belt:

- Cloths with water reduced the number of bacteria on a smooth conveyor belt by 1-2 log cfu/cm2.
- Cloths with ethanol reduced the

number of bacteria on a smooth conveyor belt by 2-3 log cfu/cm2.

- Cloths pre-wetted with ethanol are recommended, since ethanol prevents microbial growth in the cloth during storage.

- If cloths are prepared at the company, it is recommended to use dry cloths/wipes and then add ethanol just before use.

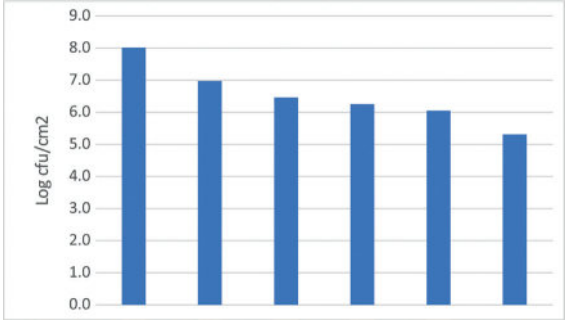
- Most importantly, the cloths must be strong, so product residues are removed when the surface is wiped.

## Steam Vacuum

The use of steam vacuum as a way of cleaning during production offers huge potential. Currently, steam vacuum is primarily used in some of the large slaughterhouses to remove faecal contamination or flare fat from the carcasses on the production lines. Several years ago, DMRI developed a handle (Tubular 5) for the stationary steam system. Using this handle, you can simultaneously remove the contamination, clean the contaminated area with steam and suck the combined contamination and steam into a waste container or directly into the drain. However, it is expensive to install a permanent steam system in a production plant. Conveniently, mobile steam devices are on the market, and they can be used on the many different production lines in the food industry. Mobile Steam Vacuum device - Danish Technological Institute (dti.dk) (contact us for specifications and price).

Using a stationary vacuum steam system, we performed a challenge test where a conveyor belt was contaminated with pork belly that had been inoculated with a high number of the most common meat spoilage bacteria. The bellies were left on the conveyor belt for four days in order to heavily contaminate the belt. The test showed that by using steam vacuum it was possible to reduce the number of bacteria from 108 cfu/cm2 to 105 cfu/cm2. The greater the number of treatments, the better the reduction.

Different tests have shown that repeated steam vacuum treatment can leave the conveyor belt visually clean, dry and with a significantly reduced number of bacteria. The effect depends on the frequency of treatment, the nature of the surfaces being treated (rough, smooth, hinges, etc.) and the type of product residues being removed (wet, dry, product stuck to surface, etc.).




*The decrease in detected bacteria on the conveyor belt, going from the control (no steam treatment) on the far left followed by 1, 2, 3, 4 and 5 steam treatments.*

## What´s Next?

At DMRI, we continue to work on optimising the cleaning procedures, with particular emphasis on the environmental perspectives of cleaning, for example reducing the amount of water and applying more "green chemistry".

Most importantly, we must constantly bear in mind that production hygiene is a complicated issue and that hygiene has a direct impact on food safety and the shelf life of the food products. Cleaning is the key to maintaining a good level of production hygiene and is ultimately a question of targeted efforts and dedicated work

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# FI EUROPE INNOVATION AWARDS: HONOURING INNOVATION BY FOOD INGREDIENTS COMPANIES


Jury rewards outstanding ingredients and concepts in the fields of health, sustainability, sensory and technology innovation

The winners have been announced! During the Fi Europe Innovation Award Ceremony, which took place on the first day of the world's leading ingredients trade show Fi Europe, co-located with Hi Europe, in Frankfurt, six companies received a coveted award recognising their achievements. The previous day, all 19 finalists presented their entries to the expert jury chaired by Prof. Colin Dennis. The Fi Europe Innovation Awards recognize outstanding achievements in the food and beverage industry. This year's winners address current consumer trends with their solutions - from gut and immune health, to naturalness and sustainability.

During the ceremony at the Innovation Hub, which was also streamed live online, Prof. Colin Dennis and Julien Bonvallet, Brand Director, Fi Europe, presented the Fi Europe Innovation Awards to the following winners:

**Clean Label & Natural Innovation Award:** Bunge Loders Croklaan (The Netherlands) for Karibon, a 100% shea-based cocoa butter equivalent (CBE) that combines all the processing benefits and versatility of leading CBEs with the nutritional and sustainability benefits of shea

**Food Tech Innovation Award:** Chr. Hansen A/S (Denmark) for its FreshQ® food cultures, enabling fermentation-based biological protection against yeast and moulds without undesirable sensory effects and acidity development, thus helping producers to naturally prolong shelf-life and quality

**Health Innovation Award:** NutriLeads (The Netherlands) for BeniCaros™, a proprietary ingredient for immune health that has been clinically proven to support and optimise immune function, and response

**Plant-based Innovation Award:** DSM (The Netherlands) for Maxavor® Fish YE, a natural fish flavour derived from algal oil for producing authentic fish alternatives, including vegetarian fish nuggets and vegan fish sauce

**Sensory Innovation Award:** AAK (Sweden) for AkoBisc® GO!, a biscuit fat that is low in saturated fatty acids and free from tropical fats, offering a unique sensory biscuit quality with a crunchy bite, no fat bloom and no discoloration over time

**Sustainability Innovation Award:** Fonterra Cooperative Group/NZMP (New Zealand) for taking action on climate change by recently launching its first carbonzero™ certified ingredient – Organic Butter

For Erik Dam, CEO at NutriLeads, the award honours the intensive development work undertaken by his firm in recent years. "We are a small team and have only been on the market since 2012," he explains. "The fact that we now hold an Fi Innovation Award in our hands with our very first product is wonderful recognition of our efforts. BeniCaros™ is derived from by-products of carrot juice production and scientifically proven to accelerate the immune response, therefore addressing several consumer trends at once."

Alberto Rosado, Global Innovations Manager Bakery at AAK, says it's marvellous to receive such positive endorsement for their ingredient from the panel of industry professionals. "This award recognizes the innovative strength of AkoBisc® GO! which not only scores in terms of sustainability, but also provides sensory enhancement of baked goods while significantly simplifying the various production steps," he says.

**www.informa.com**

# LALLEMAND BIO-INGREDIENTS INTRODUCES THE SAVOR-LYFE® P SERIES

Lallemand Bio-Ingredients develops, produces and markets high-value yeast products including whole cell nutritional yeast, yeast extracts and yeast derivatives. Company's ambition is to provide food processors with wholesome and sustainable components to optimize their culinary objectives.

The company has just introduced the Savor-Lyfe® P series, a range of meaty, pork-type flavors with a unique cooking-style touch, for the successful innovation in plant-based and convenience food, including snacks and ready meals.

Plant-based lovers are craving for variety, their diet shall include more than beef-like burgers!

With Savor-Lyfe® P series flavors Lallemand Bio-Ingredients offers to conscious consumers the authentic meat experience while keeping the promise of a more sustainable meal.

Those new flavors are not only suitable for plant-based food, as they can provide an easy-to-apply solution to innovate and boost the flavor profile of prepared meals, such as meatballs, burgers, filled pasta, soups, etc.


**Savor-Lyfe® PH 04:**
**Ham style, cooked meat**

**Savor-Lyfe® PR 06:**
**Roasted meat, pork-like**

**Savor-Lyfe® PS 05:**
**Smoked meat, bacon-like**

The global rise in demand for more nutritious and healthier aliments is a trend that is not going to abate in the future. A wide variety of "free-from" will further increase in popularity among the consumers thus posing an urgent need for alternative solutions also for ingredients suppliers that must always keep


themselves up-to-date with the global market trend.

Savor-Lyfe® SSC is an allergen-free light brown powder with characteristic umami, savory impact and the typical soy sauce flavor notes. It is possible to utilize Savor-Lyfe® SSC in soups, sauces, marinades, snacks, and spice blends, to enjoy its ethic cuisine profile without soy and wheat major allergens. At relatively high dosages (1-2%) its slightly bitter and metallic notes contribute to giving juiciness and a bloody profile to meat substitutes.

Another innovation within Lallemand Bio-Ingredients flavor portfolio is the Toravita® flavor-masking range. The incorporation of novel plant-based proteins into foods could be challenging due to undesired bitter notes and unfamiliar "green" flavors, typical of the vegetable proteins. Toravita® yeast-based, natural ingredients are great tools for flavor houses and food processors, to modulate the perception of those undesired notes.

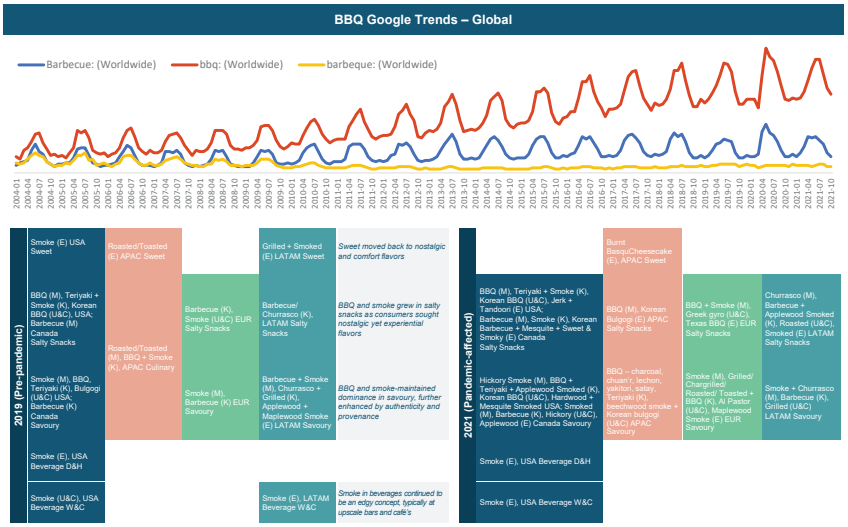
**www.bio-lallemand.com**

# KERRY IDENTIFIES BARBECUE AS THE WORLD'S TOP TASTE IN 2021

Barbecue has emerged as the world's top trending flavor for innovative, authentic-tasting snacks, meats and meat alternatives, vegetables, sauces, marinades, and seasonings.

Kerry, the world's leading taste and nutrition company, has reviewed extensive research and examined global trends in emerging flavors in an effort to identify the top global taste trend in 2021. The result: Barbecue—in all the many variations that can arise when cooking with fire—is electrifying consumer appetites and elevating expectations for new and interesting flavors. This includes in snacks, meats, plant-based meat alternatives, vegetables, sauces, dips, marinades, and seasonings.

A total of 26 barbecue, smoke and grill tastes were identified across Kerry's Taste Charts in Europe, APMEA, North America and the Latin American region. A dozen of these were considered "emerging", while another five made the "up and coming" category. Meanwhile, Innova reports that one in every seven new products developed around the world is barbecue-focused, while in Europe 43% of new food and beverage launches in 2021 featured barbecue as a component. Asia has the most potential, with new product launches up almost one-third (to 21%) in the last five years[1]. In addition, more than 33% of all sauces and seasoning products launched during 2016-20 call out barbecue on the front of package, along with 30% of new snack products[2]. Barbecue is now ranked number three on the list of top snack flavors globally, and fifth in meat flavors ("smoked" is number one)[3].




Due largely to the COVID-19 pandemic, global backyard cooking is at an all-time high. Furthermore, since every global region has extensive variations and traditions in barbecue, many of these are now migrating between and cross-pollinating markets and regions. In short, consumers all over the world are seeking out new taste variations on the world's oldest cooking method—fire.

1 *Innova Database of New Product Launches, July 2021)*
2 *Innova Database of New Product Launches, July 2021)*
3 *Innova Database of New Product Launches, July 2021)*

Kerry's Soumya Nair, Global Director, Consumer Research and Insights, commented on barbecue's status: "Barbecue might just be the world's new favorite taste, and the global-leading barbecue trend our analysts are seeing right now shows that consumers everywhere are looking for new and ethnic-inspired specific tastes—such as Korean, Texas or Brazilian—in various meat and snack products. Consumers love the balance of sweetness, salt, spices and smoke that seems to enhance virtually any application, and we regularly witness new barbecue-flavored items showing up on menus and in stores in foods such as snacks, meats and meat alternatives."

"Our research is confirming that today's global consumers don't just crave ethnic-inspired dishes, snacks and flavorings, but also that they're demanding authentic experiences and tastes that are true to their regions of origin. Moreover, they're actively looking for these interesting new snacks, sauces and meat products in the marketplace, and in a variety of applications. Authentic barbecue-flavor innovation, delivered quickly, remains key to winning in this fast-changing marketplace."

Kerry has identified 39 main global variations and traditions from around the world—ranging from Memphis and Texas in North America to kebab in the Middle East, yakitori, char sui and tandoori in Asia, khorovats from Armenia, to jerk in Latin America. Barbecue has also begun to enter the mash-up trend, with curry, sweet chili and beer-inspired barbecue flavors emerging globally.

Nair adds: "To keep pace with consumer desires, brands must now move faster than evolving cravings for complex and culturally nuanced barbecue tastes. It's vital in this shifting environment that new barbecue flavor innovations meet consumer expectations for the 'real' flavor of foods cooked over flames. Although barbecue is described differently everywhere, fire, the world's oldest cooking method, is at its core—seared, so to speak, in our global shared DNA."

## Kerry Red Arrow

With the most innovative technologies in the smoke and grill space, coupled with industry-leading applications expertise, Kerry Red Arrow is able to craft market-leading authentic barbecue, smoke and grill flavors with superior taste. These offerings are exciting tomorrow's consumers and driving preferences into the future. Furthermore, with consumers increasingly prioritizing sustainability, our proprietary smoke flavors—captured from heat, wood and water—offer a comprehensive solution for companies seeking to meet the demand for authentic barbecue products that are better for both people and the planet. Kerry Red Arrow is the world's most trusted supplier of barbecue flavor solutions: With an established smoke and grill heritage, wide-ranging applications expertise, a broad market reach, and invaluable consumer insights, Kerry Red Arrow is the authoritative expert on global barbecue flavors.

**www.kerrygroup.com**

# MASKING: DOES IT CONTAIN THE SECRET TO DELICIOUS PLANT PROTEIN?

Building a tasty plant protein product involves a complex process with many steps, each one raising its own questions and challenges. You could call this the plant-based challenge.

How can you boost the image of a processed protein? What about making it tastier? What about bringing back juiciness, authenticity, and meatiness to meat alternatives?

Different factors play a role here, from texture to appearance and nutrition. All going hand in hand with delivering great taste. Masking forms just one step in the process. And how crucial a role is it playing? Could it represent the underrated secret to better tasting plant protein? Let's take a closer look.

## Identifying off-notes

Today, alternative proteins come from an array of sources, including predominately legumes (like pea and soy), and also increasingly mycoprotein (fermentation of fungus) and even algae. Each comes with its own technical properties. Each with its own taste profile. Some taste more bitter. Others slightly fishy. In this first step you have to choose, which plant protein works for your product.

*"Based on innovative molecular analysis, tools like ProtiScan™ enable us to select, analyze and characterize off-notes and aromas. This makes it easier and faster to find the most appropriate approach for each application and client request."*

Nicolas Basch,
Culinary Development &
Portfolio Director

## Building Taste

Now, the choice of protein includes only the first part of the story. You now need to balance the off-notes that you have identified. Here, masking comes in. This easily overlooked step provides a neutral or culinary typified base on which to build in taste, juiciness, and aromas.

You might like to read the good news. This blank or typified canvas reduces the amount of flavoring and top notes you need to add. By limiting the sugar, salt, and fat content, you get a simpler product with a shorter ingredient list – chiming with consumer concerns about nutrition and a desire for greater naturality.

## A Holistic Approach

Increasingly efficient technologies simplify and enhance the masking process, while also enabling you to create congruent taste blocks (juicy or meaty, for example) based on the desired result.

## Neutral Taste Masking Solutions

Solutions like SymLife® Natural Flavor Masking Range can provide neutral masking blocks based on the protein's sensory profile. Does it taste dry, beany or cereal-like? This creates the foundation to enrich and enhance the flavor for added complexity and liking.

## Vegetable Typified Masking Solutions

To increase the natural vegetable taste, masking with kitchen-like ingredients provides a multitude of "clean label" solutions – whether Sapids to enrich acidity and sweetness, Alliaceous through onion and garlic or Culinary to create complex taste blocks.

### Food-Declared Neutral Taste Masking Solutions

Our portfolio of natural raw materials allowed us to create a food-ingredient-based optimizer with a neutral taste. The aim? Induce juiciness, increase salt perception and mask off-notes – like the SymLife® Food-Declared Masking Range. This forms a completely natural process based on food.

**www.symrise.com**

*"These diverse and complementary masking solutions adapt to different proteins and applications to offer a neutral or typified base. By focusing on natural ingredients, we can cater to the growing desire for more natural plant protein and help food companies build more kitchen-like recipes."*

Pierre Osche,
R&D Vegetable Leader

# VEGEMEAT: ALLERGEN-FREE MINCED MEAT ALTERNATIVE FROM GRANULATED PEA PROTEIN

Taiyo introduces 100% natural and vegan meat alternative / high protein content, free from soy, gluten, additives and preservatives

At Fi/Hi Europe, Taiyo introduced a new natural meat alternative for minced meat dishes. The granulated pea protein targets consumers not wanting to miss out on a minced meat-like texture. It is especially suitable for people on a vegan or low-meat diet who suffer from intolerances and thus pay close attention to ingredients.

Consumers on the lookout for plant-based meat alternatives will find a broad variety of products with a large array of ingredients, flavors and textures. Soy- or seitan-based products are among the most popular, but consumers suffering from allergies or those with thyroid diseases avoid these ingredients. Meat substitutes made from pea protein can fill the gap in the offer for this group of buyers. Thanks to the gentle production process, Taiyo's newly developed Vegemeat boasts excellent taste as well as a convincing meat-like texture, making a big difference compared to many other meat alternatives based on pulses.

Vegemeat is a 100% natural, vegan pea protein granulate with no typical inherent flavor, so no off-notes need to be covered with special masking flavors. The production of the meat imitation with a minced meat-like texture succeeds thanks to a sophisticated recipe and a special production process. Vegemeat promises vegan enjoyment and is ideal for popular dishes such as bolognese or lasagne.

From a nutritional point of view, Vegemeat scores with a high protein content, which at 78g per 100g of product is far above that of soy, and a fat content of only 0.3g/100g. Since no sugar is added, the carbohydrate value is also pleasingly low at 5.5g. In total, Vegemeat contains only four ingredients: Pea protein, strawberry juice concentrate, salt and glucomannan (konjac root powder). An authentic mouthfeel and a decent spicy taste meet the demands of consumers for a high-quality, well-tolerated meat alternative that leaves nothing to be desired. Manufacturers or distributors of meat alternatives or instant soups can obtain Vegemeat in various package and container sizes.

**www.taiyogmbh.com**

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# EDITORIAL CALENDAR 2022

## 1 FEBRUARY

Ordering Deadline: 11 February, 2022
Publication Date: 21 February, 2022

- **IFFA AND ANUGA FOODTEC PREVIEW**
- Slaughtering, Cutting (Blades, Sharpening Systems)
- Skinning, Deboning & Trimming, Portioning, Gringing, Separating, Sorting (Meat and Poultry Focus)
- Conveying Systems
- MAP Trends

## 2 APRIL

Ordering Deadline: 18 April, 2022
Publication Date: 29 April, 2022

- **IFFA MAIN ISSUE**
- Mincing, Blending,Mixing, Filling, Forming Technology
- Alternative Meat Formulations, Production of Vegetable Products
- Digitalisation, Automation, Industry 4.0
- Hygiene, Disinfection, Employee Sanitation Practices
- Sustainable Packaging Trends

## 3 JUNE

Ordering Deadline: 13 June, 2022
Publication Date: 23 June, 2022

- **IFFA POST SHOW REVIEW**
- Dicing, Strip-Cutting, Slicing
- Smoking, Air-Conditioning, Ripening Technology, Cooking, Coating
- Weighing, IT Solutions, Process Control, Robotics, Inspection Systems
- Skin and Whole Muscle Packaging Trends

## 4 SEPTEMBER

Ordering Deadline: 13 September, 2022
Publication Date: 23 September, 2022

- Sausage, Hot-Dog and Ham Production
- Casing, Netting, Clipping, Labelling
- BBQ Trends, Clean Label, Marinades, Sodium Reduction
- Energy Efficient Packaging Equipment's Trends

## 5 OCTOBER

Ordering Deadline: 10 October, 2022
Publication Date: 24 October, 2022

- High-Speed Cut-up Lines
- Bacon Trends, Thermal Processing HPP
- Chilling, Freezing, IQF Products, Ice Machines
- Production and Packaging of Convenience Food

## 6 DECEMBER

Ordering Deadline: 5 December, 2022
Publication Date: 16 December, 2022

- IPPE Preview
- Extracting, Processing and Packaging of Poultry Meat
- Food Safety, Hygiene, Air mananegement, Clean Roon Technology
- International Flavour Trends
- Shelf-Life Extension of Packed Meat, Poultry and Seafood

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|---|---|---|
| POLAGRA-PREMIERY | Poznan, Poland | 14 Jan - 16 Jan, 2022 |
| IPPE | Atlanta, USA | 25 Jan - 27 Jan 2022 |
| MeatEx | Toronto, Canada | 3 Feb - 5 Feb 2022 |
| Fish International | Bremen, Germany | 13 Feb - 15 Feb 2022 |
| Gulfood | Dubai, UAE | 13 Feb - 17 Feb 2022 |
| IFE Manufacturing Solutions | London,UK | 28 Feb - 2 Mar 2022 |
| Meat Attraction | Madrid, Spain | 8 Mar - 10 Mar 2022 |
| British Pig & Poultry Fair 2022 | Birmingham, UK | 10 Mar - 11 Mar 2022 |
| Food Expo | Athens, Greece | 12 Mar - 14 Mar 2022 |
| FOODTEC | Helsinki, Denmark | 15 Mar - 18 Mar 2022 |
| ALIMENTARIA | Barcelona, Spain | 4 Apr - 7 Apr, 2022 |
| FOOD & DRINK EXPO | Birmingham, UK | 25 Apr - 27 Apr, 2022 |
| Seafood Expo Global | Barcelona, Spain | 26 Apr - 28 Apr, 2022 |
| Anuga Foodtec | Cologne, Germany | 26 Apr - 29 Apr, 2022 |
| FOOD PROCESSING & TECHNOLOGY | Zurich,Switzwerland | 10 May - 11 May, 2022 |
| IFFA FRANKFURT | Germany | 14 May - 19 May, 2022 |
| VIV Europe | Utrecht, The Netherlands | 31 May - 2 Jun, 2022 |
| IPAC - IMA | Parma, Italy | 3 Jun - 6 Jun, 2022 |
| CFIA | Rennes, France | 3 Aug - 5 Aug, 2022 |
| WorldFood | Istanbul,Turkey | 1 Sep - 4 Sep, 2022 |
| FOTEG ISTANBUL | Turkey | 6 Sep - 9 Sep, 2022 |
| SALON DE I'ALIMENTATION | Brussels, Belgium | 15 Oct - 23 Oct, 2021 |
| SIAL | Paris, France | 15 Oct -19 Oct, 2021 |
| CIBUS TEC | Parma, Italy | 25 Oct - 28 Oct, 2022 |
| Meat Grill Days | Athens, Greece | 12 Nov - 14 Nov, 2021 |

We reserve the right to make any necessary changes.

Find out more

# New concept for hygienic design

At Habasit, we understand the importance of maintaining food-safe processing conditions. Designing the new Habasit Super HyCLEAN belt range, we looked at the best available market standards for plastic modular belts and removed their weak spots.

From reducing spaces where product residue and soiling can collect to making the belt easier to clean – we are confident you will see your benefits with a naked eye. But even under the microscope, results show up to 4,1 x less soiling and 20 x fewer colony forming units compared to other hygienic plastic modular belts.

**Habasit International AG**
www.habasit.com

Habasit – Solutions in motion

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