

INSIGHT

EDITION 9 | EN

MEAT PROCESSING

**Automated data
gathering**

In partnership
with largest Brazilian pork processor

The next level of
control and traceability

**Caring about
the environment**

The Marel logo consists of a stylized red and white 'm' symbol followed by the word 'marel' in a lowercase, white, sans-serif font.

Changing and evolving



These challenging days food processors must be able to adapt quickly in order to stay competitive. Much of this is driven by changing consumer demands and global circumstances such as African Swine Fever and Covid-19.

To meet the changing and evolving consumer demands, food processors:

- require flexibility with their processes and equipment
- continue to strive to maximize the value of their raw material
- continue to focus on sustainable production of quality and affordable end products.

Marel is dedicated to innovation and automation of processes. We develop and design food processing solutions geared towards maximizing efficiency, flexibility and adaptability in production. In addition, we give very high attention to our software solutions, which enable much of the required flexibility and provides our customers with the process control needed, including yield monitoring.

The consumer trends are driving the need for evermore product types or SKUs.

The need for a greater number and variety of end products result in shorter production runs and quicker change-over times between product types.

End products could include steaks with various thicknesses; various types of marinated; or minced and mince related products like burgers and sausages, for example.

In this edition of Insight Meat Processing we look amongst other at a number of new developments within primary, fresh meat and prepared foods processing which support processors on raw material yield and value optimization, processing flexibility and product quality. We also take a look at how to work with water treatment and sustainability.

I am sure you will enjoy reading.

DAVID WILSON
Managing Director
Marel Meat

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Automated data gathering drives food safety



The technology for providing complete data-driven farm to fork traceability is not only about blockchain, Internet of Things and other new traceability technologies. Traceability has been around in the meat industry for years and is readily available for use.

Traceability is about being able to find out where a product comes from, and following its route through the entire supply chain.

Without an effective traceability system, food processors may be shut out of lucrative new markets or lose business to companies that can demonstrate a valid traceability system.

PEN AND PAPER

"For almost two decades, I've worked on automated data collection in the food processing industry," says Rene Kjaer, Sales Director for Innova Food Processing Software. "Having visited hundreds of processing plants all over the world, I've learned that there are great differences between processors. Some of them have a high level of automation and data reliability, while others still largely use pen and paper."

SLOW RECALL

All processors are of course meeting local legal requirements for traceability. Most of the time, however, they trace food in a very limited way. Typically, traceability is possible only one step up and one step down in the supply chain, mostly restricted to a certain batch and a certain time (i.e. a few hours). In addition, each

participant in the food industry supply chain seems to have his own demarcated information silo, although parties are supposed to cooperate. This makes it hard to trace a product. Not only is the data difficult to access, but also the recall process is often very time-consuming and cumbersome.

TECHNOLOGY ALREADY AVAILABLE

In fact, many processors have only to embrace automated data collection to have access to all (existing) traceability processes. Such technologies for data gathering have been available at least for a decade. There is no need for complex, modern systems such as blockchain. Existing technology can provide highly reliable, far-reaching traceability while offering a perfect solution for a quick response to recalls.

INAC BLACK BOX PROJECT

The "INAC Black Box Project" in Uruguay is clear evidence of a successful meat traceability system. This meat project covers farm to fork traceability for 37 processing plants in Uruguay. Marel's Innova Food Processing Software plays a key role in the project. It is the data collection tool for all 37 plants in the country and feeds data into a central database in Montevideo. Based on the

'old fashioned' but proven technology of barcoding, this solution offers instant traceability at batch level from farm to fork. The INAC project goes to show that combining automated data gathering with existing technology can ensure full-blown traceability.

ROAD MAP

"We probably all share the same vision of data-driven food safety. We strive for total traceability from farm to fork. This is possible for sure," concludes Rene Kjaer. The first step in achieving this is to have a clearly defined end goal. Based on the current state of data availability in their supply chain, food processors need to draw a road map and share it with all stakeholders, including legal bodies, food safety agencies, NGO's, technology providers, processors, farmers, etc. As the leading provider of automated data collection solutions to the food processing industry, Marel is ready to take a very active role in realizing the vision of data-driven food safety.

AUTOMATIC

leaf lard removal

Leaf lard removal (flare fat removal) is one of the “toughest” processes in the slaughtering of pigs. The process is physically demanding to do manually and complicated to do with hand-tools. With Marel's new M-Line Leaf Lard Remover (MLR), robots are now able to do the job precisely, efficiently and without damage of carcass surface.

The most challenging aspect of leaf lard removal is in gripping and pulling the leaf lard in the right direction upwards from the lower part of the lard inside the belly.

Performing the job manually by gripping onto the edges of the lower leaf lard is

very rugged on the hands. Conversely, pulling the leaf lard off the carcass in an upwards movement repetitively is straining on the operator's body.

Semi-automatic solutions are currently available. However, they typically require

an additional pre-cutting operation to enable the pulling tool to accurately grasp the leaf lard. This may actually also cause damage to the inner belly and rib cage.

THE ROBOT IS THE SOLUTION

The M-Line Leaf Lard Remover (MLR) eliminates the steps of manual processing and the need for any pre-cutting. There is no need for manual scarfing or scraping of the lard tip end, neither a need to protect the diaphragm from being damaged. Even kidney offal may remain inside the carcass while leaf lard pulling if the customer's process requires so.

The system bases the pulling process through accurate 3D scanning of the inner belly of each half carcass. Two independent robots work together on each carcass, respectively pulling the left and right sides of the leaf lard off the carcass.

HANGING INSTALLATION

New to the M-Line Leaf Lard Remover lineup is a hanging version of the robot installation. The hanging version simplifies hygiene and increases floor space, which can instead be used for Dolavs or logistics conveyors.

The M-Line Leaf Lard Remover has a capacity of 650 carcasses per hour.



Accurate and consistent performance

WITH ROBOTS

Bung removal (anus drilling) is a complicated process in the slaughter line because it requires a lot of precision and concentration to avoid potential contamination of clean meat.

The risk of contaminating clean meat with bung fluid material makes the bung removal a critical process. It is, however, not a job, which just anybody can do. It requires expertise to position the removal tool accurately in the bung area to avoid not making perforations or damages.

However, even the best of experts cannot keep concentration for many hours at the time – and so slips in concentration may result in inaccuracy and meat spoilage.

For that reason, Marel has developed a robotic bung remover, which eliminates the need for persons to perform the job. The new M-Line Bung Remover (MBR) scans the pig carcass and identifies

whether it is a female or a male. Based on that identification the robot performs the bung removal operation in different ways.

TWO REMOVAL METHODS

If the pig is a female, the robot enters the bung area from the front of the carcass and pulls the bung to lay with the white organ package. This hugely reduces the risk of contamination of clean meat. If the scanned carcass is a male, the robot enters the bung area the same way but leaves it in the bung channel.

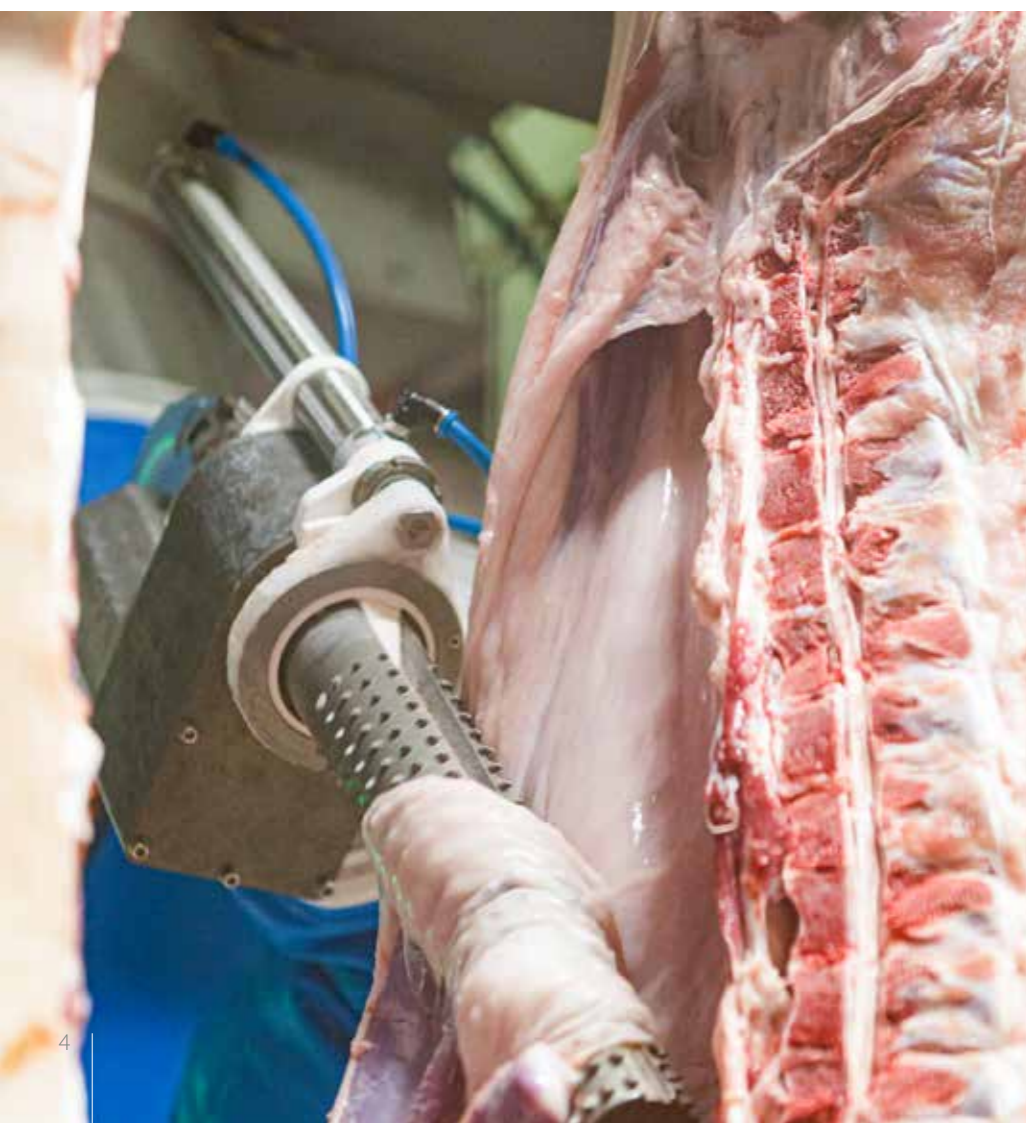
STERILIZING TOOLS

Because the process of bung removal takes place in the production area before clean inspection, there is a need to

sterilize the tools after each operation. This means that the operator has to sterilize the bung remover in hot water after each individual bung removal.

With the M-Line Bung Remover this sterilization operation has become automatic. The robot incorporates Marel's patented “Twin Tool”. The twin tool works with a cabinet in which the bung removal tool gets sterilized while a second tool is in use.

GO TO:
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“Few companies offer this type of slaughter technology, which guarantees the slaughter of 540 pigs per hour. That’s why we consider Marel and Sulmaq as strategic partners for our business”.

– Christian Klauck, Engineering Manager at Aurora Alimentos

In partnership with the largest pork processor in Brazil

On October 15, 2019, to celebrate 50 years since it was founded, Aurora Alimentos opened the largest pork processing plant in Chapecó (SC), Brazil. The opening was the culmination of several years of strategic planning and working towards an increased pig slaughter capacity. The goal of Aurora Alimentos is to reach a slaughtering capacity of 25,000 pigs per hour in 2025. With the new processing plant, Frigorífico Aurora Chapecó (FACH1), that goal will most likely be reached four years ahead of schedule.



Christian Klauck, Engineering Manager at Aurora Alimentos, said that to achieve the projected growth goal, the cooperative relied on the invaluable partnership of Marel and Sulmaq in their project to optimize and modernize the

slaughter, cutting and deboning lines at Frigorífico Aurora Chapecó (FACH1). “Few companies offer this type of slaughter technology, which guarantees the slaughter of 540 pigs per hour,” Klauck emphasizes.

◀ Christian Klauck, Engineering Manager at Aurora Alimentos.



SUSTAINABLE EXPANSION

In the company’s strategic planning for increasing their pig slaughter, the cooperative started by examining the conditions of its existing plants, in search of methods to increase production.

Antônio Wanzuit Júnior, Manager of Frigorífico Aurora Chapecó (FACH1), said that they quickly realized that

FACH1 would be the most suitable for development. The possibilities for sustainable expansion and overhauling the wastewater treatment area was excellent. However, the fact that the expansion could be carried out without compromising the production flow was ultimately the deciding factor.

“With the new plant, we can meet higher demand from both the foreign and domestic markets,” emphasizes

Antônio Wanzuit Júnior. The Chapecó plant directs 55% of its output of raw pork cuts to foreign markets.

TECHNOLOGIES USED

One of the highlights of the Frigorífico Aurora Chapecó (FACH1) project was the CO₂ group stunning system, which significantly reduces stress amongst the pigs. Furthermore, the addition of the

ABOUT AURORA ALIMENTOS

Aurora Alimentos is a central cooperative with 11 other affiliated cooperatives, and is responsible for producing raw material (according to strict quality standards) and for direct contact with farmers.

With the plant expansion, Aurora Alimentos now employs a total of 30,000 people, of which 4,000 are at FACH1. Once at full capacity, the facility will reach 5,500 employees before the end of 2020.





Antônio Wanzuit Júnior, Manager of Frigorífico Aurora Chapeçó

CO₂ stunning system has improved the quality of the meat significantly.

Another system adopted in the slaughtering process was a dehairing machine that uses biogas, a critical factor in reducing greenhouse gas emissions.

The automated carcass chilling chambers allow carcasses to be classified and sent for deboning, according to the processing specifications. In addition, the automation makes the presence of operators in a low temperature environment unnecessary.

AHEAD OF TIME

The project to expand the Chapeçó plant began three years before its inauguration in 2019, with the works commencing 16 months before. By the end of 2019, the plant was

slaughtering approximately 7,500 pigs per day. The plant is on schedule to reach its full capacity of 10,527 pigs per day in the first half of 2020. At this stage, the Aurora Alimentos conglomerate will be slaughtering 25,000 pigs per day.

Among all of Aurora's pork plants, FACH1 is its most certified facility. It is also the only Brazilian meat processing plant that exports fresh pork to the United States. By meeting the strictest requirements, the plant can export its products to nearly 20 countries, including China, Hong Kong, Japan, South Korea and Chile.



Durability and reliability

Environments inside a processing plant can be challenging for equipment. Water, constant moisture, and hot and cold temperature can wreak havoc with sensitive electronics and affect their precision. For that reason Icelandic slaughterhouse Sláturfélag Suðurlands, always looks to durability and reliability when investing in new equipment.

The scales at Sláturfélag Suðurlands are used eight to ten hours per day, and often more with seasonal production fluctuations. The hygienic design means the scales can be washed down and sanitized quickly for rapid product changeover.

There are approximately 30-40 Marel scales in different configurations throughout the Selfoss plant. M1100 scales and floor scales are used extensively throughout the factory floor.

FLEXIBILITY MATTERS

The harshest environment at Sláturfélag Suðurlands is in the salting room. Anna Runolfsdottir, Head of Product Division at Sláturfélag Suðurlands explains, "We have two Marel scales in our salting room. We have had other equipment 'melt' in these rooms, but our Marel scales look like new after more than 20 years of use.

Because of the longevity of Marel scales, the total cost of ownership is very reasonable. Anna Runolfsdottir likes to point out, "Not only are we buying a reliable scale, but the longer lifespan means less disposal and replacement of equipment. Better for the environment, and better for our bottom line."

Marel's Innova Food Processing Software connects the company's extensive

network of scales. Innova helps Sláturfélag Suðurlands monitor all quantities that go through production and records the utilization of products. Having an integrated system with a clear overview of the entire production and order processing was a game-changer for the company. The company is looking at incorporating Innova's recipe system soon and enhancing traceability for all of its products.

SLÁTURFÉLAG SUÐURLANDS

Sláturfélag Suðurlands is the largest slaughterhouse in Iceland, with approximately 20% of the country's animals processed at their facility in Selfoss annually.

The company's meat products have been a mainstay of Icelandic meals since 1907. Sláturfélag Suðurlands is best known for its hot dogs. Sláturfélag Suðurlands also produces steaks, hangikjöt (smoked lamb), meat toppings, ham, and ready meals.



The next level of control and traceability for the pork slaughter process

Marel's Slaughter Information System manages the pork slaughter process from the receipt of live animals through to the carcass cooling room. It lets you control, monitor and improve the process in real time. It also ensures full traceability and supports the execution of all quality control procedures.

REAL-TIME DATA COLLECTION

Automated data collection is becoming an increasingly important part of food processing. The Slaughter Information System collects data in real time and transforms it into reports and dashboards, which allow you to make informed decisions—quickly and with certainty. It also gives you a complete and clear overview of the entire primary process.

The system captures and registers vital information such as kill number, weight, grade, sample information, veterinarian inspection results and yield. This data not only drives speedier decision-making to improve planning and performance but also ensures full traceability of animals throughout primary processing.

Operators can enter information using a scanner or touch screen at terminals located at key points throughout the slaughter process, including live animal receipt.

The screens are user friendly, intuitively operated and completely configurable to allow for individual requirements, for example specific data required by veterinary inspection authorities.

Weighing stations can be installed at different locations in the slaughter line to register animal weight or to assign the weight of by-products to an animal or slaughter lot.

FULL PROCESS CONTROL

From the moment live animals are received, the Slaughter Information System ensures they are registered against a purchase order and details from the initial inspection are captured. It is at this point that the traceability chain

begins. Truck weighing and quality inspections are options that can also be added.

During stabling, the operator assigns animals to pens or lanes. The system then connects pens with the planned slaughter process. The information collected by the system not only provides a real-time, live-animal inventory but also improves animal well-being by registering both the filling rate of each pen and the total stable time.

After stabling, animals are taken through the slaughter process for stunning, killing and bleeding, scalding and dehairing to the clean slaughter line. From here, the system assigns animals to individual hooks and sequences them with a kill number. This ensures all data collected can be linked to individual carcasses throughout the slaughter process.

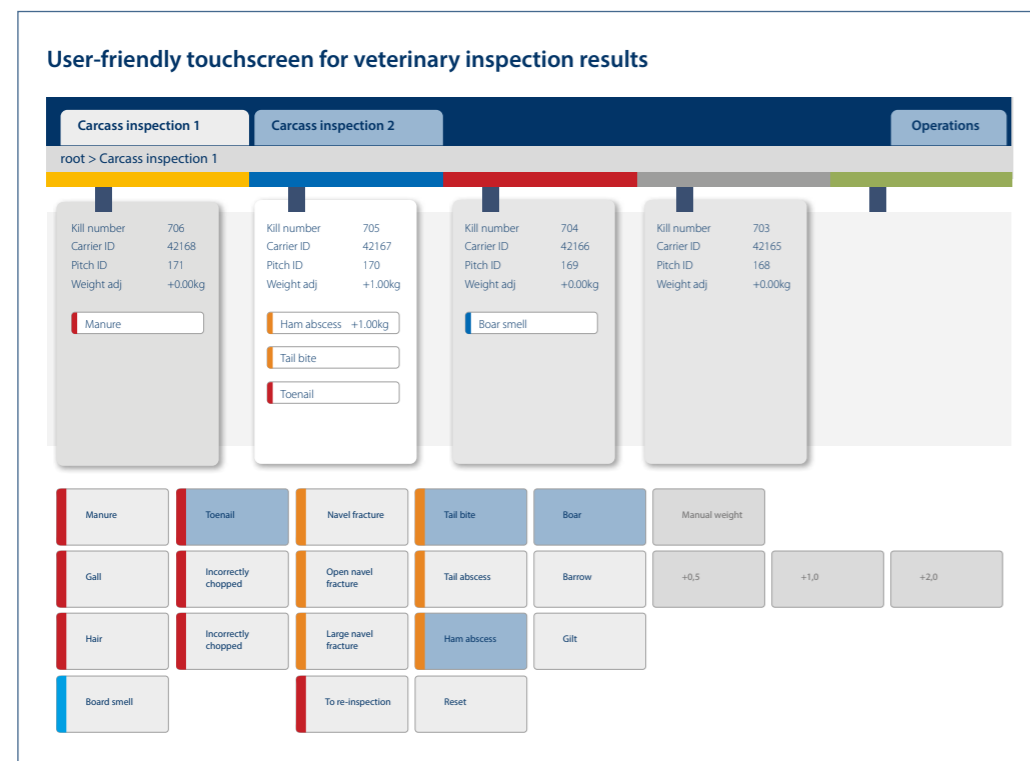
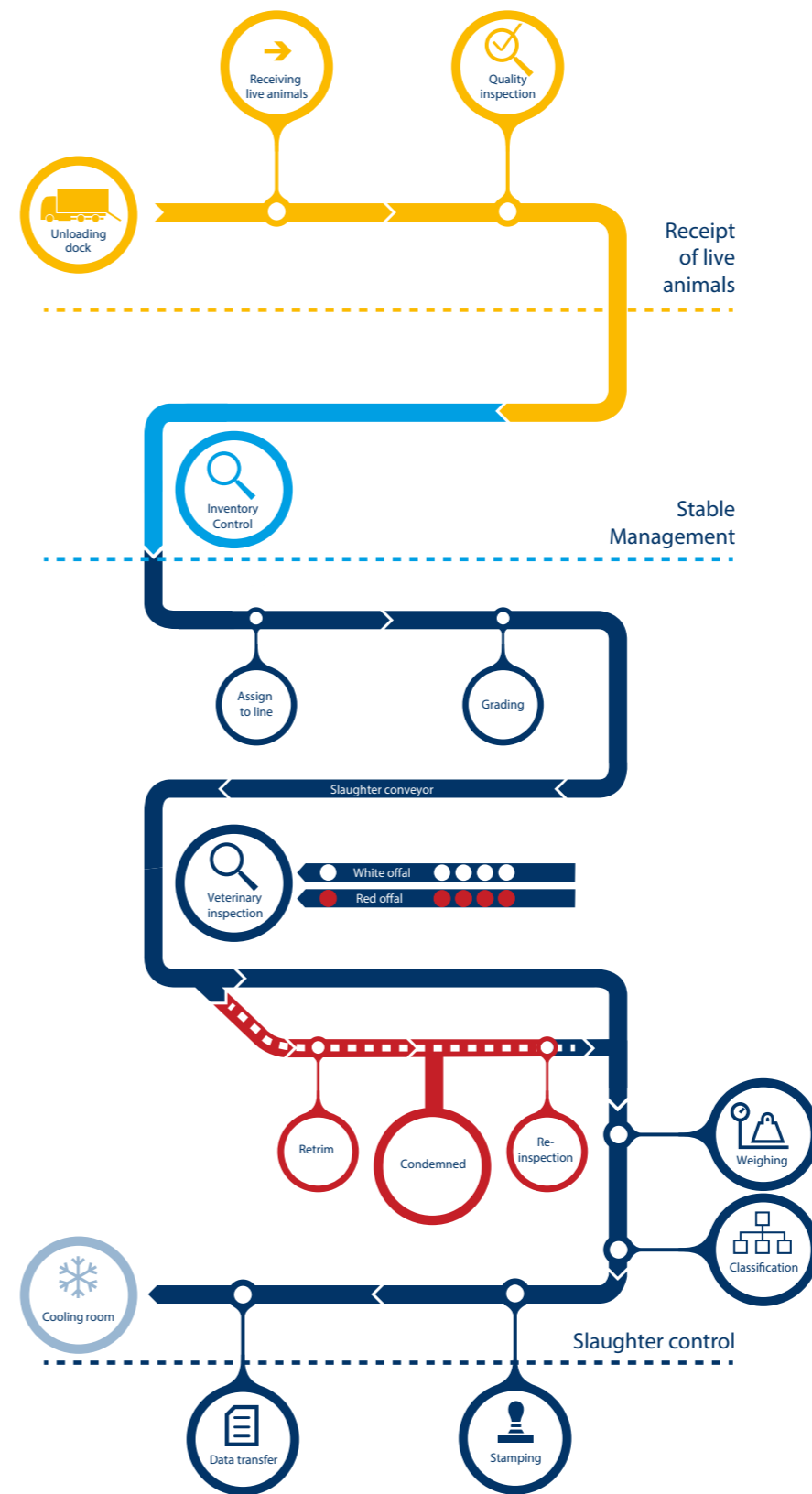
During the grading process, the fat-to-lean ratio is recorded for each carcass. After this, the veterinarian inspection records any defects and registers remarks concerning quality. The system then uses this information to send a carcass, if required, to re-trim, re-inspection or to be condemned. At the same time, terminals provide important information to operators, such as where to trim a flawed carcass.

CARCASS CLASSIFICATION

Based on the data collected throughout the primary process the system can automatically give each carcass a sorting class using a classification matrix module. Carcasses with a particular class have similar characteristics allowing them to be stored together on specific rails in the chilling room, helping to achieve optimal order fulfillment.

PERFORMANCE MANAGEMENT

The data that the system captures and registers is used to create dashboards and reports, which give valuable



insights into production and quality. This information supports multiple functions across the organization and can help different stakeholders manage and improve the slaughter process in different ways. It also plays an important role in supplier evaluation.

DETAILED PLANNING

Using the data collected for each carcass, the system generates a precise overview of what is being processed. The level of detail gives the planning department a clear overview of what raw material is available for the next stage of processing. This allows them to ensure maximum value is obtained from different parts of the carcass and to accurately plan order fulfillment.

QUALITY MANAGEMENT

The Slaughter Information System registers all information required by law, suppliers and customers. It can also generate legally required documentation. This removes manual audits and checks and minimizes the risk of human error. In addition, data is collected in real time making it possible to take swift and appropriate action if production starts to deviate from the desired specifications.

INCREASED TRACEABILITY

There is a growing trend and an overall need for more traceability in

food processing. The Slaughter Information System plays an important role in providing data to achieve this. The system conducts quality checks and collects specific data, so that every end product can be traced back to an individual animal. This not only gives consumers piece of mind but also ensures food processors can act quickly and precisely to minimize the size of any recalls. In addition, it helps processors who deal with different quality lines to ensure they are kept separate.

COMPLETE INTEGRATION

Innova Slaughter Information System is a fully integrated part of the Innova Software and can connect to other Innova modules to give additional control through secondary processing and beyond. It can also connect and synchronize with ERPs and other third party systems.

TAKE IT TO THE NEXT LEVEL

With the trend in food processing for automation, digital transformation and food safety, Innova's Slaughter Information System is a crucial tool that will give you the control you need to take your business to the next level.

GO TO:
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Innova Slaughter Information System supports multiple functions



"Thanks to the reliable multihead weigher, we can consistently meet our daily production goals on schedule."

– Ricardo Valenzuela, Prodea S.A., Chile

Higher yields and accuracy in batching

Chilean processing company Prodea S.A. reduced their labor force from 15 to 5 employees per shift in their Santiago facility, by adding one of Marel's Multihead Weighers to their cube cutting line.

While designing the frozen product processing plant, Prodea decided to create a dedicated area for the automation of the cube cutting process, batching and frozen meat packaging.

AUTOMATING AND IMPROVING

To guarantee portions of a fixed weight, with a minimum giveaway and the highest yields possible, Prodea turned to Marel for their IQF Multihead Weigher.

"Our concern was to meet the market's needs by paying attention to all stages of our production," says Operations Manager at Prodea, Ricardo Valenzuela: "Being a leading provider of institutional products, our focus is to deliver the

highest quality products throughout Chile."

The IQF Multihead Weigher is built to operate in the harsh, low temperature and humid environments of frozen product processing.

"Before installing the Multihead Weigher, we batched manually, and it took a lot of operator time, especially when working with small batches of 250g and 500g. With the new equipment, we are able to fulfill orders extremely fast and at the

same time minimize giveaway," says Mr. Valenzuela. Currently, Prodea supplies approximately 200 tons of cubed meat a month, sold mainly to institutional clients, such as food service companies.

ACCURATE AND CONSISTENT

Mr. Valenzuela finds that the main advantage of their new IQF Multihead Weigher is the higher productivity and the accuracy in batching. "Thanks to the Multihead weigher, we can consistently meet our daily production goals - faster and even with less labor needed".

Another feature of the equipment that Mr. Valenzuela identifies as making a positive difference is the robustness and, consequently, the low cost of maintenance. "We carry out preventive maintenance plans, as established by Marel Service. We have complete confidence that the equipment will continue to serve us with the efficiency necessary for our long-term business needs," says Mr. Valenzuela.

ABOUT PRODEA

Located in Santiago, Chile, Prodea S.A. has 270 employees. Its focus is with food service, industrial clients and most of the cafeterias of the National Council of School Aid and Scholarships (JUNAEB). These provide a daily breakfast to 2,100,000 children.

Prodea is dedicated to the processing and supply of beef, pork and poultry products. The company offers whole, sliced, portioned, semi-processed, fresh and frozen cuts.



“With this new linker, we can run up to 20 percent faster, depending on the size of the product. We also have better weight control on the individual sausages and less giveaway.”

– Noah Haskell, Director of Operations – Square-H Brands

Reaping the rewards of the new Frank-A-Matic Linker

The Frank-A-Matic Linker has been a great investment for Square H-Brands in California. It has improved their production process, which in turn has supported their growth. So much so, that within a year, they invested in a second machine.

Family-owned company Square-H Brands has been in business for more than 85 years. At their production facility in Vernon, California, they produce a wide variety of hot dogs and sausages, as well as corned beef and other deli meats.

NEW INNOVATION

Noah Haskell is the Director of Operations and has been working for the company for over 20 years. When Marel approached him to run the first of the

new generation Frank-A-Matic Linkers in his production plant and help with the further development of the new machine, he was very eager to be part of this advancement.

“We are always interested in new machines and innovations in the market. So when we were first introduced to Marel’s new Frank-A-Matic Linker, we were very happy to see the industry moving forward. Immediately, we were

open to the idea of running the first of the new generation Frank-A-Matic Linkers and working closely together to develop the machine even further,” says Haskell.

OPTIMIZING PRODUCTION

Haskell explains that after running the new Frank-A-Matic Linker for some time, what stood out most was the improvements in the production process. “With this new linker, we are able to run

up to 20 percent faster, depending on the size of the product. We also have a better weight control on the individual sausages and less giveaway”. The company has also seen faster and more precise changeovers, which is important when running numerous products each day. Haskell continues, “our versatile product offering includes more than 40 different types of sausages for customers in retail and food service. The sausages have different lengths, diameters and are

made from various meat mixes. Being able to change more quickly and easily between different products gives us a huge advantage.”

GROWTH THROUGH PARTNERSHIP

A large team from Marel has worked on developing the new Frank-A-Matic Linker. Haskell has met with many of the team members and has always sensed their complete dedication to making the product successful. “Throughout this

process, Marel has proven to be a great partner. We have had frequent contact with the sales and service organization and whenever we wanted to try something new, Marel were happy to help us out. They have provided excellent training and top-notch, on-site support,” Haskell comments.

GOTO:
marel.com/frankamatic



A GREAT INVESTMENT

After just twelve months of using the new Frank-A-Matic Linker, Square-H Brands decided to purchase a second one for their production plant. “the Frank-A-Matic Linker has turned out to be a great investment for our company, which has really supported the growth of our business. Without this linker, that wouldn’t have been possible,” concludes Haskell.



Marcos Manzo from Marel (left) and Noah Haskell, Director of Operations, Square H-Brands.

The latest trends in burger production

Changing consumer demand brings opportunities

The market for burgers is changing. And it is changing fast. There is increasing demand for different types and textures of burger. This gives enormous potential for meat processors.

If you want to take advantage of opportunities in the burger market, you need to differentiate yourself from the competition. To achieve this successfully, it is important to have flexible processing in terms of texture, shape and volume. And being able to consistently produce unique burgers of a high quality is key.

THE RISE OF THE BURGER

Ever since the hamburger as we know it was introduced in the early 1900s, the burger market has changed dramatically. The 1970s saw a rapid increase in the popularity of burgers as a result of the rise in demand for convenience food, the growing popularity of fast food and the automation of the production process.

In the last two decades, the trend towards quality, taste and customization have resulted in the emergence of the premium burger. Driven by its popularity, fast food chains, cafes, high-end restaurants and retailers started adding comparable, high-quality burgers to their menus and product ranges.

Whatever the type, there are two crucial factors that affect the consumer experience. Both need to be equally addressed when producing a burger; appearance and texture.

APPEARANCE IS KEY

The appearance of a burger, in both an uncooked and a cooked state, will strongly

influence the buyer decision process and is very important for overall consumer satisfaction.

Burgers mostly have a round or oval form but some will have straight, sharp edges, while others are more rustic with a rougher, bulkier form. It is purely down to the individual's personal preference which of the many shapes is favored.

After cooking, a burger should still look appealing and it is important that it remains a similar size. Cooking the burger will cause collagen fibers to contract, but it is possible to ensure shrinkage is visually minimized by controlling the orientation of the collagen fibers during processing and steering them in a vertical direction.

As the burger is cooked, the reduction will then be in height rather than in diameter. This means that it will look similar in size before and after cooking, giving the consumer an optimal post-purchase experience.

TEXTURE DETERMINES TASTE

Appearance is not the only thing that characterizes a burger. Texture also plays an important role and highly influences a consumer's taste experience.

Texture is determined by the grind size of the meat and orientation of the meat proteins, most importantly the collagen fibers. By controlling the direction of the fibers, it is possible to obtain a certain

texture. The size and orientation of fibers allows different amounts of air to be contained inside the burger, which creates different levels of juiciness. Increasing the size of the fibers also gives more bite, improving the feeling in the mouth and giving a more beefy texture.

THE MAIN TYPES OF BURGER

Each burger type has its own characteristics to meet diverse consumer preferences and they all have their own specific target market.

Soazig Pinheiro, Product Specialist at Marel explains, "Through the years, we have seen various generations of burger types. Each one will give the consumer a

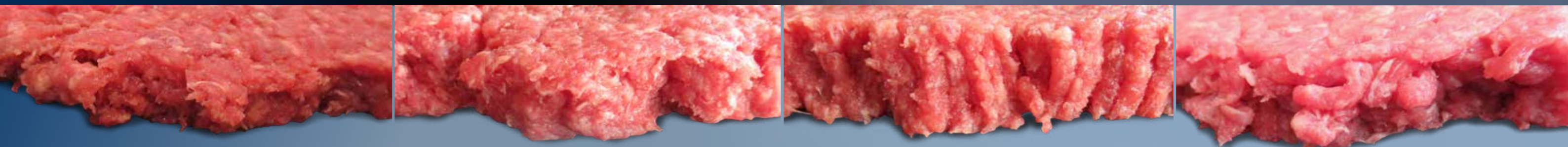
specific eating experience and taste. Today we have the standard burger, which is typically pressed and without a clear fiber orientation. There's the homestyle and tender-fresh burgers, where the fibers are oriented vertically. And then you have the butcher burger where fibers are interlaced."

Regardless of volume or burger type, we have a scalable solution to meet your needs.

GOTO:
marel.com/Burgers



- BUTCHER BURGER**
Interlaced fibers
- HOMESTYLE BURGER**
Fine fibers with vertical orientation
- TENDER-FRESH BURGER**
Thick fibers with vertical orientation
- STANDARD BURGER**
Unordered fiber orientation



WHAT'S YOUR STYLE?



THE STANDARD BURGER

This type of burger uses a meat mass with an unordered fiber orientation resulting from the grinding or mixing process. It is preferable not to use high-pressure forming with this kind of meat mass in order to prevent shape distortion and loss of raw material. Instead, it should be gently portioned in a mold without the use of any additional fiber orientation techniques.



THE TENDER-FRESH BURGER

The tender-fresh burger is characterized by its bite and beefy texture, which is created by a vertical fiber orientation. When biting into a tender-fresh burger the independent columns come loose in the mouth and there is no need to cut through fibers. An added advantage with vertical fiber orientation is that most of the shrinkage is in height rather than diameter.



THE HOMESTYLE BURGER

When a looser bite is desired, the same fiber orientation as the tender-fresh burger is used but the size of the meat columns is reduced and finer vertical fibers are created. These smaller fibers also limit the visual shrinkage.



THE BUTCHER BURGER

An alternative fiber orientation is the butcher style or angel-hair texture, where the fibers are interlaced. This texture leaves some air inside the burger, which increases juiciness and reduces cooking time. It also gives the burger a unique, artisan texture and look.

Caring about the environment

Sustainable development and environment preservation are part of Aurora Alimentos' business values. Thus in 2019 the company Frigorífico Aurora Chapecó (FACH1) chose to install a Marel water treatment system at the pork slaughterhouse.

“During the expansion of the Chapecó slaughterhouse, we also looked for a supplier, who could offer a wastewater treatment solution that would support our growth plans. Once more, we found that with Marel and we also immediately understood that its performance would be much superior to the existing system”, says Luciana Frassetto de Campos Breda, sanitary engineer at Aurora Alimentos.

Adequate wastewater treatment is a growing concern among companies in the meat processing sector. This is because the slaughter of pigs requires a large amount of water, which must be

discharged. Wastewater contains blood, fat, excrement, fragments of tissues and other organic substances that, if discharged untreated in the environment will contaminate surface and underground water resources.

Until the new project at Chapeco Aurora Alimentos worked with a Marel water treatment system, which used an aerated stabilization lagoon system to treat effluents. However, they needed to think of an alternative that would optimize the land space dedicated to water treatment. In addition, Aurora Alimentos needed to meet the environmental requirement to

remove nitrogen as a condition for discharging treated water back into the riverbed. “In fact, we needed a smaller system, but more efficient and with greater control over all stages,” says Luciana Breda.

STATE-OF-THE-ART TECHNOLOGY

With the adoption of the Marel system the effluents from the red lines (blood, oils, greases and solid and liquid effluents from the slaughter process) is pretreated in a coagulation, flocculation and flotation (DAF) unit. This pretreated water is then combined with the effluent from the green lines (manure, urine and liquid

effluents) and the sanitary sewage water and then treated in a biological system.

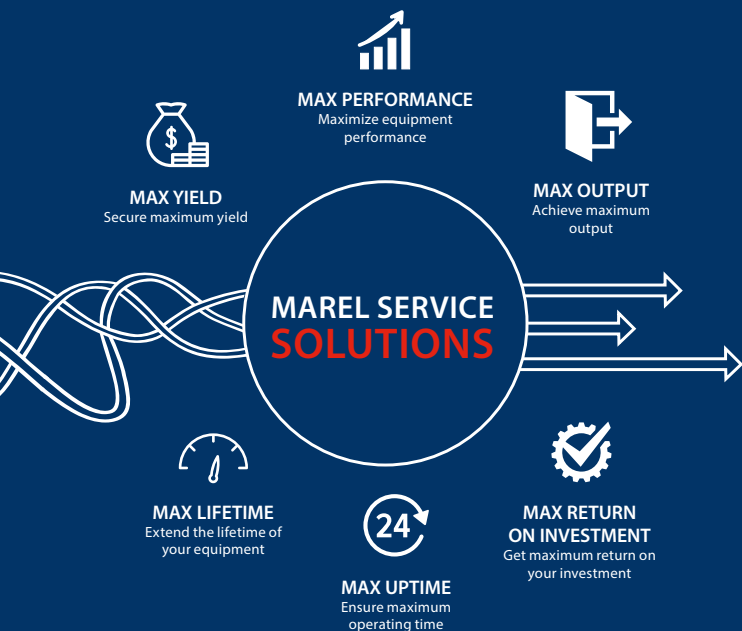
The biological system consists of:

1. an anoxic zone to enhance total nitrogen removal
2. an aerated zone to further remove nitrogen and carbon
3. and a clarifier for the separation of the sludge and the water.

After disinfection the clean treated water is discharged into the environment.

“The wastewater treatment system at Chapecó is still new, and we are still in the process of adjusting it. However, the expected results have already been achieved, such as the level of ammoniacal nitrogen and the removal of BOD [biochemical oxygen demand] and solids”, Luciana Breda concludes.





Services to suit your specific needs

Marel's Service Solutions are a range of tailor-made services to suit specific customer needs. Each Service Solution is carefully assembled according to the customer's priorities and preferences. The Service Solutions offer a range of benefits while providing customers with the peace of mind that their operations will run smoothly.

In supporting our customers with the optimum service solution, we focus on matching the available services to the customer's specific requirements but also keep in mind that some services are subject to equipment compatibility or geographical availability.

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MEAT SHOWHOW 10 March 2021

Each year in March we host the Meat ShowHow, demonstrating our meat processing equipment and systems in our demo and training center, Progress Point in Copenhagen. We had to cancel Meat ShowHow 2020 due to the Covid-19 - but we plan to host a Meat ShowHow event again in March 2021.

marel.com/meatshowhow

- Discover the latest developments in meat processing technology
- See complete integrated systems with ongoing live demonstrations in a hands-on environment
- Learn how automation can help optimize production and yield, increase food safety and innovate end-products
- Meet our specialists and network with colleagues from the global red meat industry

In the days after the Meat ShowHow, we also give you the possibility to sign up for individual equipment demonstrations to go into detail of a specific processing topic or product.

Progress Point is located in Denmark, only 10 minutes away from Copenhagen's Kastrup Airport.

In partnership with our customers, we are transforming the way food is processed. Our vision is of a world where quality food is produced sustainably and affordably.