The definitive guide to MES software in poultry processing

TRANSFORMING FOOD PROCESSING

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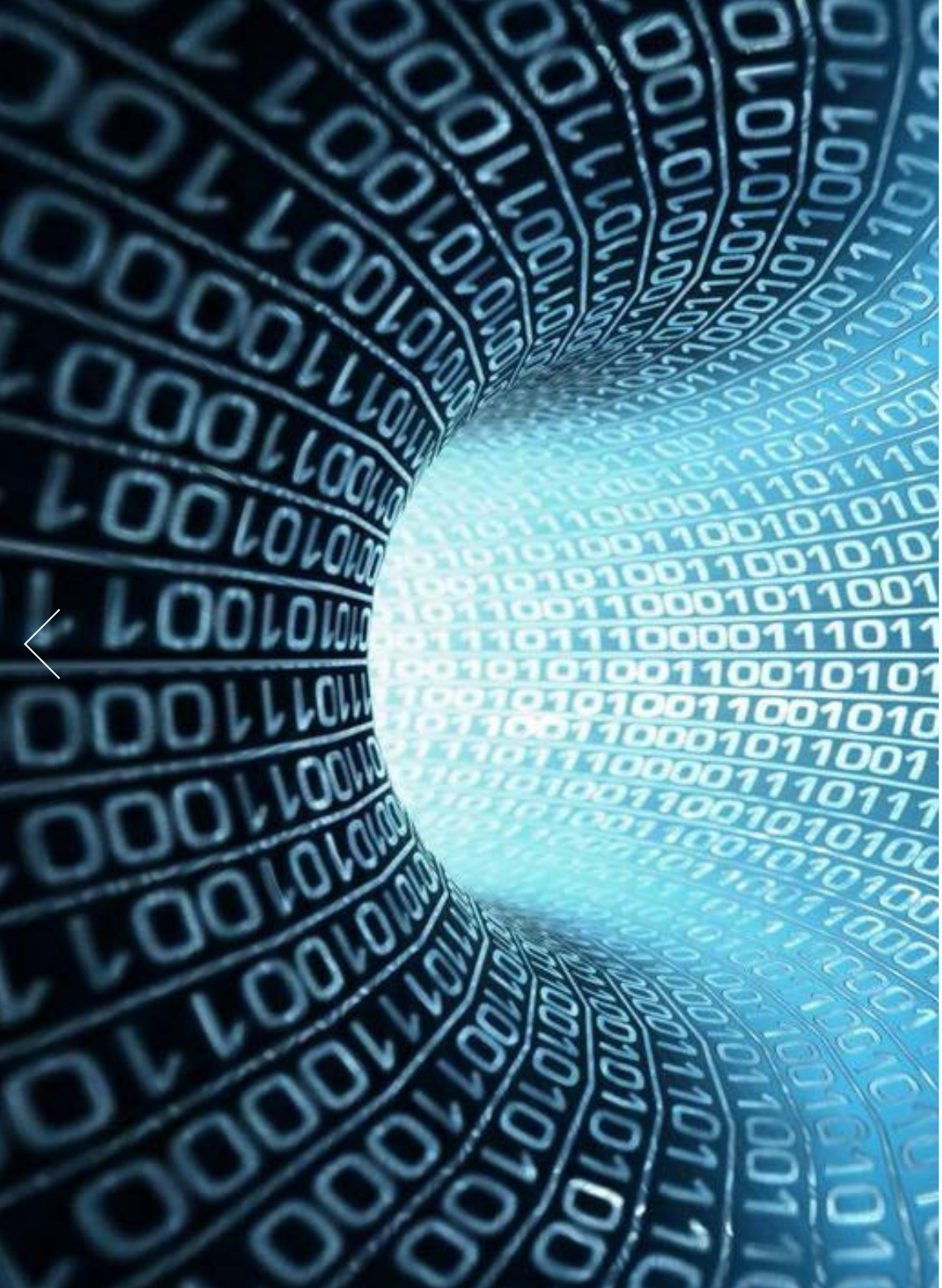

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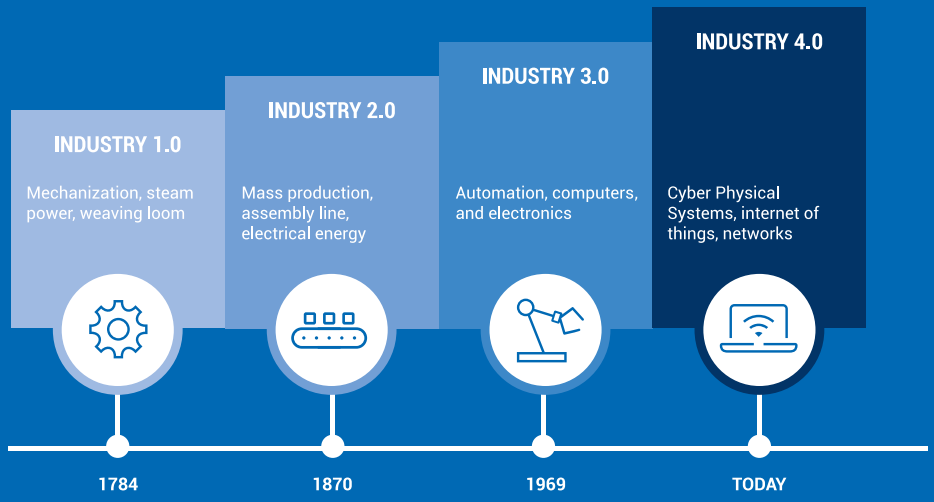
Introduction: Software and its role in poultry processing

The poultry industry has changed. As one of the leading proteins sold worldwide, increased demand has required processors to turn more toward growing technology and automation to produce at the desired rate. Where pen and paper filing used to work, processors moved to Excel reports to keep track of historical data. Even though some processors still use these 'after-the-fact' data entry methods, they are inefficient and unreliable when it comes to competing in today's poultry industry.

As the demand for more and better product increases, so does the need for fast and accurate data collection. These demands have increased pressure on poultry processors in ways such as:

- Higher cost of raw materials
- Increased customer demand
- More complex supply chains
- Changing regulatory landscapes
- Increased need for performance indicators
- More competitive environments



In response to these pressures, many processors are relying on different software platforms to meet their needs. Software solutions, specifically manufacturing execution system (MES) solutions, provide many new and innovative ways to alleviate these pressures by controlling the machines and collecting information at every step of the production cycle. These MES solutions give processors the ability to make informed decisions while maintaining full product traceability.

A manufacturing execution system is a system that enables processors and manufacturers to control their process by dictating programs and parameters from a single system for equipment at any point in the process line. The system also acts as a data historian by collecting real-time data about the equipment and products and storing it in the database so the information can be easily found and displayed or exported as needed. A good MES is also modular, so that users can build it around their company's specific needs.

The poultry industry, like many others, now requires such systems in order to function properly in a technological society. Not only is efficiency essential to meet increasing demands, data quality and reliability are needed to meet local and global safety requirements. This paper explains how poultry processors can utilize MES software solutions to relieve many of the issues they face.

Challenges

Insight

The easiest way for processors to begin optimizing their business is to gain insight into how they currently work and what changes they may need to make. Having insight into individual process performance, overall performance, employee performance, and quality control can help optimize the production cycle. Processors can gain these insights with various software solutions.

Increased efficiency

Having better insight increases efficiency. By providing processors with information regarding their facility's performance, they can make corrective decisions to achieve a higher level of efficiency. Processors can use software to automatically collect and analyze this information so that they can make decisions more quickly and effectively.

Worker performance

Companies can use insight into worker performance to measure whether the workload is too heavy or if additional training is needed. By implementing software solutions, processors can track key performance indicators (KPIs) such as time in and out, throughput, and yield output per employee to help determine what action is necessary. By identifying difficulties for workers and creating plans to alleviate them, companies can improve worker retention and thereby save money by decreasing the need to train new hires.

Order trends

Managing orders is one of the best ways to ensure an efficient production cycle. Knowing what product needs to be produced, how much needs to be produced, for what customers, and when it needs to be shipped allows processors to schedule what work needs to be done and prioritize packing. This helps them to ship the right product to the right destinations at the right time and with minimal waste.

Managing orders can be challenging because orders are constantly shifting, from the type of order to the amount of product that consumers are asking for. However, these shifts can provide great insight into what processors need to focus on next if the data is captured as a trend. With historical data on order trends such as seasonal fluctuations and availability as well as size variations of birds between farms, processors can plan their processing schedule around events that predictably cause a fluctuation in product orders.

Data trends

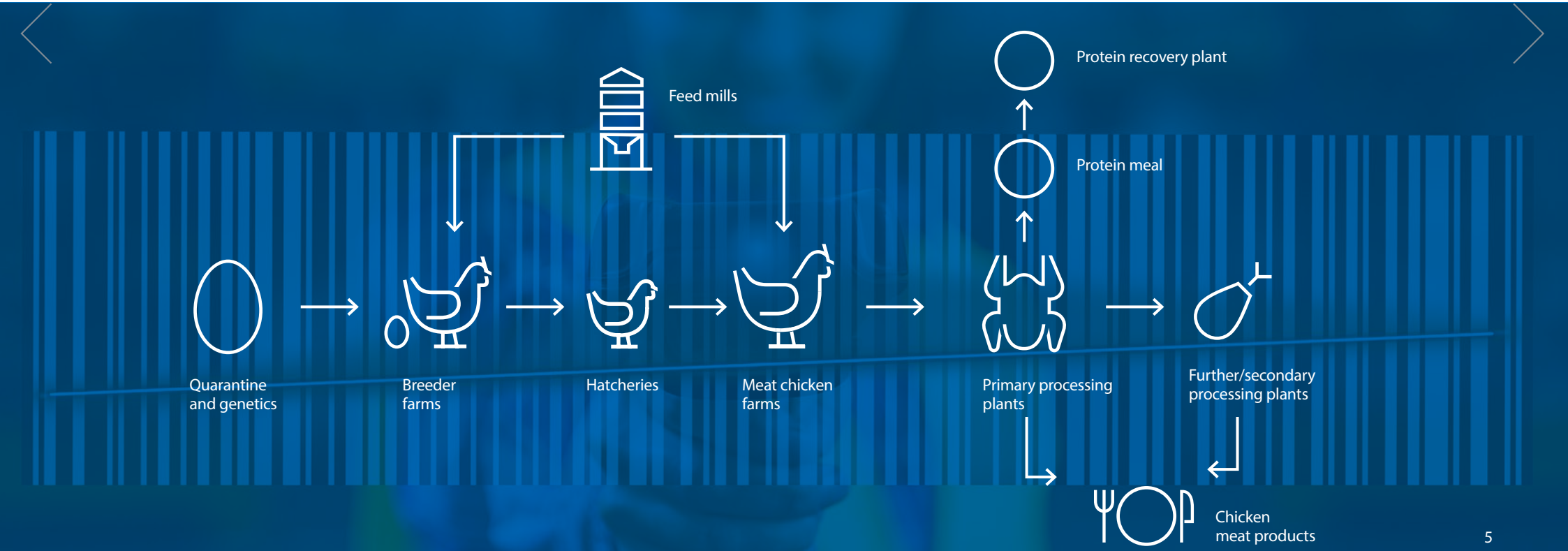
Historical trends in data can also help to provide valuable insight into the overall production cycle through comparisons to previous cycles. This information can help processors determine which changes have improved their production and which have slowed processes down. They can then make decisions to combat certain historical factors such as an increase in demand during a holiday season, a shift in processing designs due to bird size fluctuations, and employee shifts based on holidays or specific employee output.

Traceability

Processors need proper traceability to meet quality control and food safety standards. Both consumer demand and government regulations play a large role in the need for a traceability system. With consumer trust on the line, it is imperative for processors to do everything in their power to ensure the quality and safety of the food they produce.

With the correct software solution, processors can trace product that has shipped out of the facility to a production day, a production line, and even back to the original farm that it came from. This can be done by assigning a lot number at any point in the process where the product changes form. When the live bird is received, it will be assigned a flock (reception lot) number so that it can be tied back to the original purchase order. That number can be maintained through the primary process with the use of counters and product detectors. Once the flock is distributed to secondary processing lines, individual pieces created from the bird will be given a production lot number.

When products are collected and packed, they are assigned a packing number, and the same is true for pallets, orders, and shipments. With all of these lot numbers and collection IDs, full end-to-end traceability is achievable, and with the utilization of labeling and scanning, the process can be accomplished efficiently and accurately. This information, its validity, and its ease of access are vital to alleviate the pains of a recall situation, saving time and effort for the processor. It is important then that a software system is in place to both assign and record these IDs so that processors can find the data quickly.



Quality control

Quality control is a necessary feature for all poultry processors. The types and number of quality checks vary from facility to facility, based on different contributing factors such as government and regional regulations as well as shipping regulations. Many processors still perform these checks with checklists and manual registration using pen and paper, but this process is prone to issues of data validity and ease of access.

Using the proper software platform, processors can design quality checks for any part of the production process, register them quickly in real time, and store them in the database so they can generate reports with both up-to-date and historical data. This flexibility in design and electronic process allows processors to get the information they need and not waste any valuable time.

Reduction of losses

Processors face two types of product loss: total loss and partial loss. Total loss occurs when the raw material is unusable or there is a recall event due to product issues. Partial loss occurs when processes are not optimized to reduce overall giveaway.

Some loss of raw material is inevitable, but with the correct software in place, it is easier for processors to minimize the number of losses due to a recall by implementing a traceability solution. This allows the processor to locate a specific processing line, or even better, a specific production lot to recall rather than recalling an entire day's worth of product. They can also decrease possible future losses if they can locate a trend associated with these historical losses and make the appropriate corrections.

Giveaway can also be considered a loss, but a well-placed software packing and yield solution can help to control areas where these partial losses are found. Based on order information, portioning devices, weighing devices, and packing scales, processors can use the software system to determine how best to make changes on the lines or in the packing areas to decrease possible giveaway.

Changing regulations

Advances in science and knowledge are causing food safety standards to evolve. Software can be used to provide quality control and dynamic labeling solutions that enable processors to access and adjust what they are reporting and labeling. If the standards change, food processors with advanced traceability software implemented will be able to immediately access product information and text to determine if they still meet the standard or need to adjust.

There is also the example of exporting product, as a country's regulations and required label information can change. If a processor is not prepared to update what information the country is requesting, it can cause major delays in shipments or even a complete loss of shipments. With a dynamic and flexible software platform, processors can adjust to potential regulation changes quickly, saving them time and money.

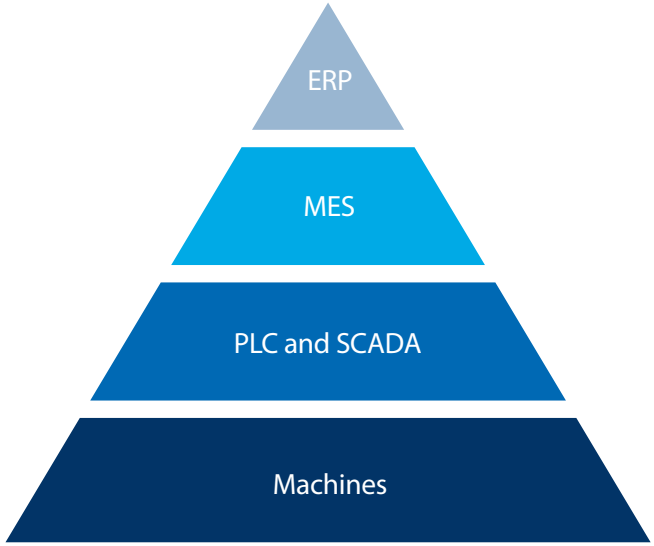
Data

As software and other technology become more active in the food processing industry, one of the most significant factors is data collection and access. Be it data about the products being made, the ingredients used, worker performance, or process optimization, data is important.

For data to be useful for decision-making, it must be accurate and reliable. Inaccurate or unreliable data hurts more than it helps. Often, human error is the primary cause of inaccurate and unreliable data, which is why many industries have shifted to using software to gather it. While there is still a chance of inaccuracies when using software, real-time data capture from the equipment itself greatly decreases this risk.

Integration

As there are different areas of business to keep track of, there are different software programs dedicated to those areas. For maintaining finances and order control, there are ERP (enterprise resource planning) solutions. For inventory movement and transactions, there are WMS (warehouse management system) solutions. For poultry and other proteins, there are farm solutions. And for production and processing, which is what this document covers, there are MES (manufacturing execution system) solutions.



Though these systems focus on a specific area of business, there can also be some overlap. An MES solution can cover both inventory and traceability, which is what a WMS and ERP also cover, respectively. It is important then for processors to know exactly which systems they need and do not need. It is also important for these systems to communicate with each other, so processors do not waste time looking in two different places for specific information or waste time making sure data matches between the systems.

Product information

Obtaining data about products that is both accurate and reliable is important for improving overall insight and traceability for food processors. This is one of the major strengths of implementing software services into a processing facility because it can automatically gather data while also translating it into dashboards that are easily understood. This real-time data then allows processors to see if they are packing to their desired specifications, and if not, they can make changes quickly.

Equipment and process information

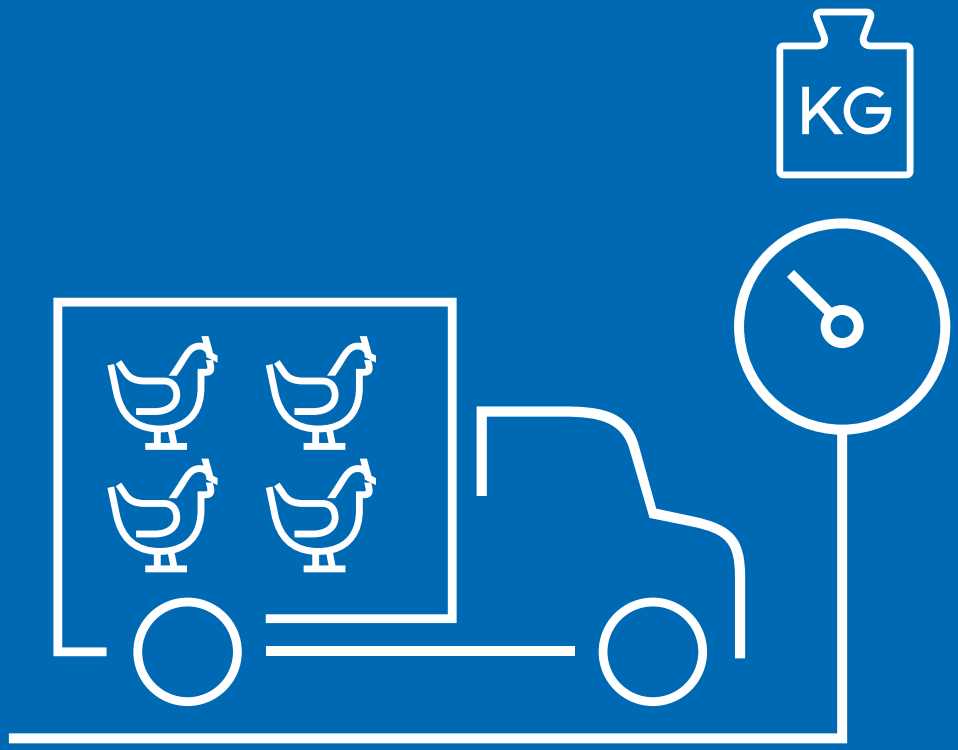
This same data also gives insight into how well certain equipment or processes are performing by tracking them over time. Looking at past data and comparing it to current data can provide insight into whether the performance could be better. Users can then view trends to see what portion of the production cycle was slowing everything down. This real-time information can also be translated into dashboards, so processors can see if any equipment is down or running slowly and make changes accordingly.

Performance information

Software can also help to track employee performance data, which can be incredibly useful to retain good employees as well as determine which employees are struggling and need additional training. If there is a major trend among all workers, it can indicate that the company needs to make process changes. Alternatively, the data can help to determine which workers are outperforming the rest, deduce why, and use that information to help others improve.

Primary processing

Primary processing includes the reception of live birds, staging, stunning, slaughter, scalding, de-feathering, evisceration, quality checks, and ends with chilling.



Live bird handling

One of the most important factors in the reception process is determining the total weight of the load. This information can be used to calculate average bird weight to determine yield figures and to provide processors with the information they need to properly pay their suppliers.

This is accomplished most often through a weighbridge, which captures the weight of the incoming load complete with birds in crates, as well as the outgoing weight of the same truck with empty crates. The empty crates may also be weighed individually to calculate the tare weight. This allows processors to determine the actual weight of a received order, the actual date and time of its arrival, and determine average bird weight (Incoming weight – Outgoing weight/Number of birds).

> With the correct MES software solution, the weighbridge information can be integrated easily, so loads can be marked as received in real-time while information is being updated. Once the reception process is completed, the order information can then be exported to the financial system via an integration service for accurate order fulfillment.

With the combination of the weighbridge statistics and bird quality down the line, processors can also gain insight into which suppliers to continue doing business with based on the data collected from each delivery, which will help reduce their overall losses and ensure they receive quality product each time.

Flock intake and receiving

Another important factor in receiving is being able to trace birds back to the supplier. This not only provides the supplier statistics mentioned above, it also gives processors an audit trail if there is ever a recall situation. The MES software will provide a flock number or reception lot number at the time of reception. The flock or lot number that the birds are assigned helps provide traceability throughout the entire production cycle.

> From the reception information, processing lines, yield figures, production days, and expiration dates to packing and pallet IDs, the MES software can track what has happened to that lot and where it is, or where it has been. This information, easily accessible, gives processors a great advantage in any recall situation or product inquiry that might occur.

Hanging

The bird hanging process is done manually, either after the crates have been emptied or after the birds have been stunned. With manual bird hanging, there is still potential for human error. With the correct MES software, the processor can track the hanging of the birds on each shackle. This helps to determine later in the process if the bird has fallen off or is hanging on only one leg due to mishandling during hanging or even at a transition point during a shackle change.

Any birds that are found to be DOA (dead on arrival) are removed from the conveyor line. The loss is then recorded in the system by an operator, either through a push button or through a touch screen application. These losses are recorded against the flock that is currently being hung, providing more statistical information regarding the farm and/or transporter.

A bird counter is also used in order to count the number of live birds being hung per flock. This count, along with the number of DOAs and net weight of the load, provides the processor with the information they need in order to pay their supplier.

Empty shackles are also recorded. This allows processors to see any gaps in the hanging process, see if any birds might have dropped further down the line after the initial hanging, as well as provide some room between flocks, so the flock process and changeover can easily be identified.

Stunning (when applicable)

Stunning birds is an important part of the poultry process, whether it is done prior to or after hanging them. It is done to immobilize the birds for safer handling, as well as minimize bird suffering by rendering them unconscious before slaughter. It also provides a more accurate killing cut and prevents muscles from tensing and hardening at the time of slaughter, allowing for a better final product.

The stunning can be done either through a high-frequency electrical water bath after initial hanging, or by the use of a controlled multi-phase atmosphere chamber before initial hanging.

> MES software can be utilized for this phase of primary processing by periodically recording information such as line speed. This information can help to determine if the processing time or process itself is set at the correct levels. If the process is incorrect there, it can result in increased numbers of conscious birds. Alarms can be set up as an automatic alert for the operator to perform a quality control check if problems like this occur.

Scalding

Scalding takes place after the birds have been slaughtered and drained of blood. The scalding process loosens the feathers on the birds by immersing them in hot water or by the use of steam, making it easier to remove the feathers.

By using MES software, processors can optimize this process by recording the current temperature and line speeds during it. If the line speed is too slow or the temperature is too high, it can lead to skin or meat damage. If the line speed is too fast or the temperature is too low, feathers will not be removed as easily. This information gives operators insight into this part of the process, so they can determine when to make adjustments to decrease quality losses.

De-feathering

The de-feathering process is completed using mechanical pickers or pluckers that have rubber fingers that rub the feathers off the carcass.

> Processors can place counters and product detectors before and after the de-feathering machine, so the MES software can measure throughput and losses. This allows processors to see what losses they are experiencing due to the de-feathering process and if the machine needs to be calibrated differently.

Evisceration

After the birds are slaughtered and de-feathered, the viscera pack must be removed before they are sent to the chiller. Evisceration is an automated process that removes the viscera pack quickly and hygienically, and it can be configured to harvest the giblets for sale.

Processors can use MES software during this process to monitor the equipment and ensure it is all working correctly, while also collecting figures for dropped birds and single-leg hangers.

The condemnation process can also be utilized in this area via push buttons or touch screen applications, so these losses and their causes can be recorded in the system against the current flock.

Post mortem inspection

The post mortem inspection takes place after the birds have been eviscerated. It allows veterinarians to check the birds and corresponding viscera packs for any defects or disease. Using MES software, they can perform quality control checks and quickly record and attach inspection information to the flock.

Birds that are damaged will either be rejected and discarded, or will have the offending material trimmed and removed from the carcass before being reintroduced to the line. This trimming can be registered via a scale and touch screen application, so overall flock yield can be correctly adjusted.

Rehanging

Between different areas of primary processing, birds will be transferred or rehung in the following area's shackles. This allows processors to keep track of which flocks are in which part of the processing line and maintain their progress through chilling. Automated rehanging systems can be used along with product detectors and line speed to indicate to the MES software system which flock is being transferred to which area maintaining a seamless flow. These systems can also help to indicate where any drops or one-legged hangers have occurred in the process.

> However, if the birds are being hung manually between areas, operators can also use a touch screen application to determine which flock is passing through which area. This process is very important to maintain traceability and make sure any condemns or inspections are registered to the correct flock.

Chilling

After the evisceration process is complete, the chilling process begins. Birds are either run through a chilled water bath, or they enter into an air chiller. During this time, the product is cooled and allowed to rest before secondary processing or final packaging.

For air chillers, MES software records information such as room temperature, number of birds, one-legged hangers, and line speed to determine any losses during the chilling process, as well as whether the chilling temperature is at the correct level and whether the flocks are spending enough time in the chiller itself. Typically, air chill times range from 3 to 3.5 hours before they proceed to secondary processing.

For water chillers, MES software records information such as water temperature and speed. Flock traceability is lost with water chillers because product is no longer on a line, so flock progress is determined by product detectors before and after the chiller and by a major focus on chilling time. The typical chilling time for water chillers can range from 1 to 2 hours before product is rehung and introduced to secondary processing.

> Processors can use MES software to manage alarms, giving them the ability to make changes quickly if anything regarding the chilling process is incorrect.

They can also use the software to manage items such as line speed and temperature, and all information regarding the product is used for statistical analysis and to help processors prepare for the day, so they know how many birds are expected once the chilling process is complete.

Secondary processing

Vision grading

Vision grading consists of a high-speed digital camera and LED lighting combined with advanced recognition MES software.

> The MES software uses the images captured to evaluate the birds based on size, shape, and color, and to identify any potential defects such as broken wings or tears in the flesh. The software then uses this evaluation or grade to determine where the birds should proceed if there are multiple lines to consider.

Although vision grading generally takes place after the chilling process, processors can also use it after the evisceration process. Using vision grading MES software before the chilling process can help determine if any of the primary processes are causing an issue as opposed to the chilling process resulting in discoloration that leads to a false positive.

In-motion weighing

> After the chiller, birds might pass through an in-motion weigher, which registers individual bird weights for the flock. This information, along with the vision grading, can help processors determine where product needs to be sent to reduce waste and maximize profits.

In-motion weighing can also be used in primary processing for live bird weights, or after evisceration to register pre-chill WOG (without giblets) weights. Any of these weights can be used to help monitor yield figures for WIP (work in progress) or finished products.

Product distribution

As mentioned before, utilizing the in-motion weighing and vision grading gives processors the ability to determine where products go. Processors could have multiple processing lines designed to fit a specific bird size. Processors could also base destinations on the bird grade, i.e. if the bird has a broken wing it will not go to whole bird packing.

> For these scenarios, it is very helpful to have these grading recipes and line assignments ready, so the correct birds are going to the correct drop points with no guesswork involved. By determining which birds go where, processors can optimize their yield and ensure the quality of their final product.

Processors can also record all of this information, such as number of birds per drop, weight, size, and defects for further analysis of their process and what birds are being supplied to them.

Cutting

Once birds are released from the chiller, they can either be packaged completely, or will proceed to cut-up lines. These lines may be automated using in-line cutting modules to portion whole carcasses into their individual products such as thighs, breast meat, wings, drums, tenders, or combinations like leg quarters and front halves. Cutting lines can also be manually operated with cone lines where multiple operators will break down a carcass cut by cut into their final products.

Regardless of whether the line is automated or manual, processors can utilize MES software to measure certain KPIs. As mentioned before, using the weighing and vision grading allows processors to calculate the number of birds and overall weight per line as well as maintain traceability. Using scales or weighing equipment after these cutting lines can also help processors calculate yield figures for each line as well as for specific products, so they can see how effectively their cutting lines are operating.

Deboning

Deboning can be automated or manual depending on the processor. Much like the initial cut-up lines, yield points can be determined before and after the deboning lines, so processors can monitor number of birds per line and yield figures to determine the effectiveness of the line.

In some cases, processors can use MES software in the manual deboning process. Operators have the ability to login to their own stations along a conveyor belt. Cuts can then be directed to them based on how many pieces they currently have.

> The MES software component also records a product's weight in and weight out for each station, so it can measure individual yield figures for each operator. The figures can then be displayed on a screen, so operators and floor managers can see which stations are meeting the correct yield amounts. This not only helps processors measure employee output and effectiveness, it can also promote competition among the employees.

Trimming

It is important for processors to control the removal of excess fat, skin, and bone fragments from product to meet a specific yield parameter. Using trimming modules in an MES solution allows processors to measure and display product weights, yield, and even employee KPIs as discussed above. This information enables processors to control giveaway and monitor employee performance.

Bone detection

Boneless products are a very important product for processors, and it is crucial that these products are completely bone-free in order to meet standard quality specifications. For this reason, processors will implement X-ray devices that are calibrated specifically to look for bone fragments and reject pieces that need to be reworked.

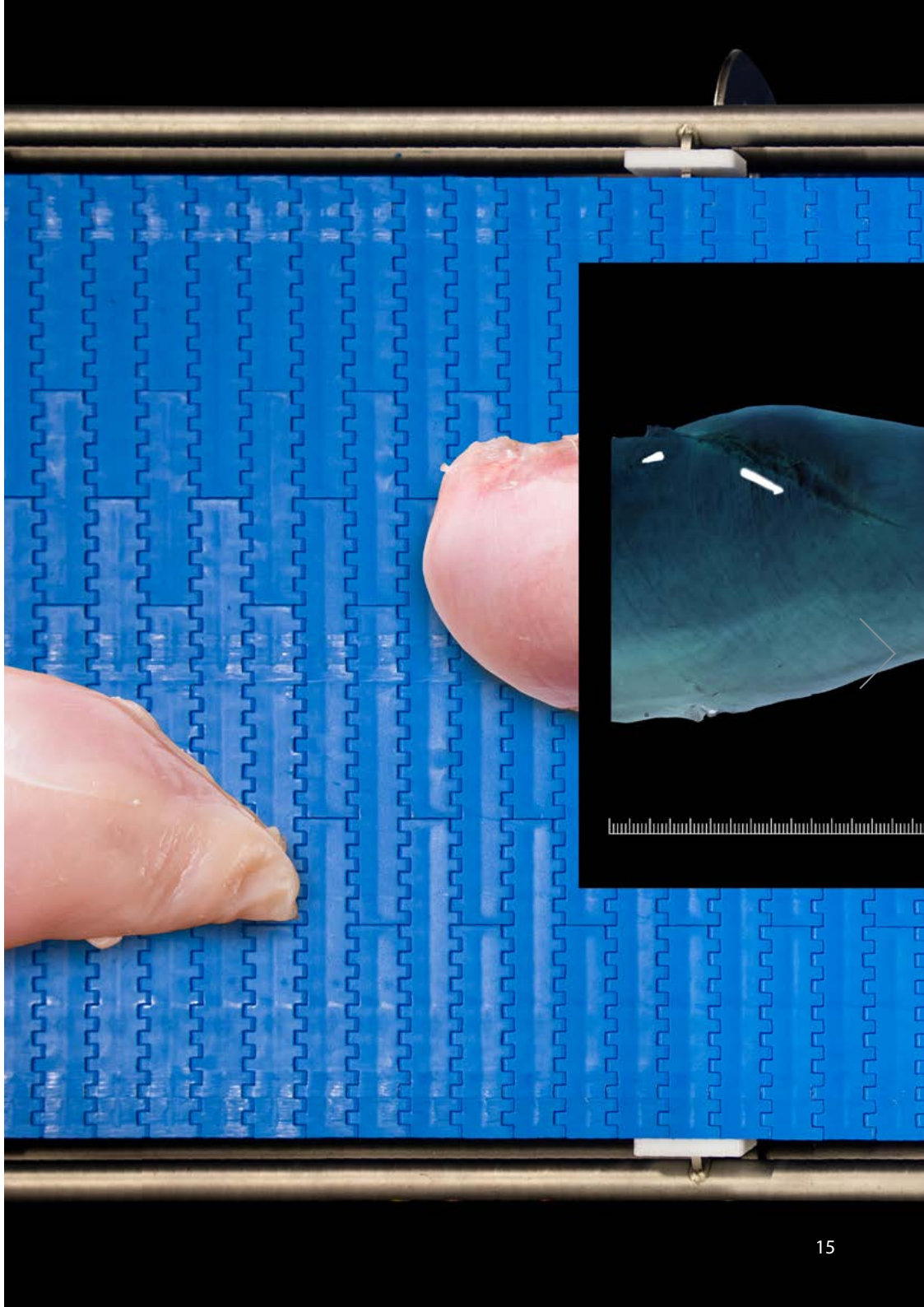
> With the addition of MES software, processors can control programs and tolerances and assign them to different X-ray machines from a single location. The data recorded on these machines can also be collected within the MES software database, so different KPIs such as throughput, number of rejects, number of bone-free, and individual weights can be accessed, analyzed, and displayed for each device.

This information can indicate whether the deboning lines are operating correctly and advise processors to any changes that need to be made to programs.

Piece grading

Much like whole bird grading at the beginning of secondary processing, individual pieces may need to be segregated to specific areas or drops based on their size. This is typically done with a machine, which weighs the individual pieces coming through and assigns them to gates based on their size. This could be used for consistency of packed products or to make sure similar sized pieces are assigned to the same portioning machine.

Similar to bone detection, MES software can be used to control grading programs and assign them to multiple machines from a single source as well as collect product weight, throughput, and distribution figures and store them for further analysis. Processors can also use the MES software to add a layer of functionality to the machine and batch product based on a particular weight range for packing purposes.



Portioning

In order to create specific final products such as nuggets, strips, or consistently sized fillets, processors use portioning machines with a blade set to a specific angle or water jet cutters to cut input product into its final shapes.

Processors can again use MES software to control cutting programs and assign them to different machines, as well as collect KPIs such as throughput and yield figures for each piece. They can then use this information to see how consistently their machines are operating and if they need to make any changes.

Further processing

Further processing consists of any additional changes made to product after it has passed through the secondary processing area such as injecting, coating in spices, frying, or cooking. These processes are usually separated from secondary processing and require the addition of dry or wet ingredients and other machines such as mixers, fryers, and ovens to produce a final product.

> With these additional components, it is important for processors to have a quality MES software platform to keep track of what is happening in this area. MES software can be used to keep track of all components including dry goods, packaging, and raw materials, so processors can control and monitor the amount of product used for specific recipes as well as maintain traceability for all elements that make up a final product.

MES software can also be used to communicate with the machines, so information such as temperatures, runtime, and downtime can be measured, giving processors the ability to make changes as necessary. With all of these features, processors can ensure that they are packing and shipping a consistent end product.

Batching

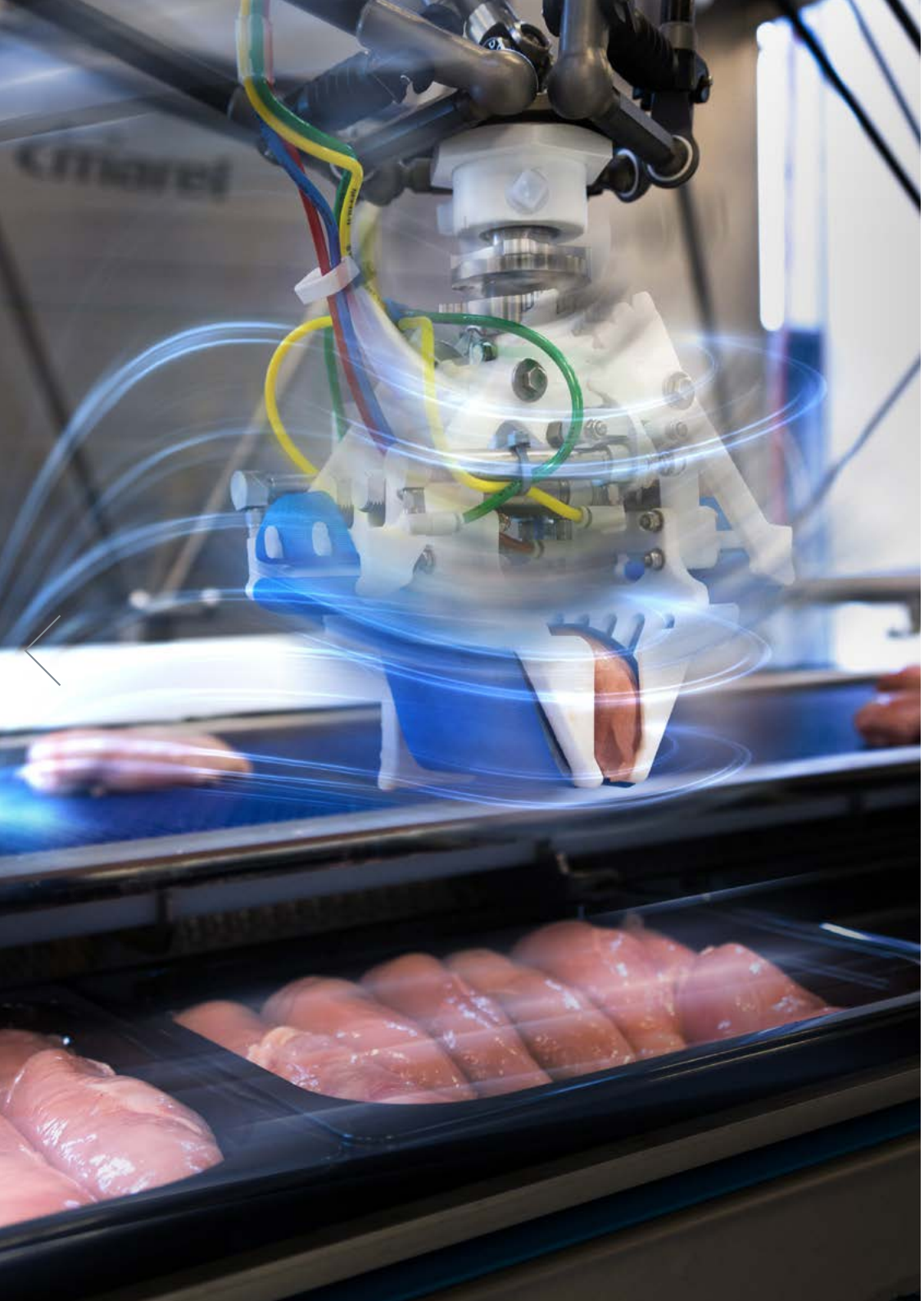
Once product is ready to be packed, it is beneficial to place similar sized product in the same receptacle to control the amount of giveaway and create a uniform final product. For this purpose, processors can implement batching machines to quickly and accurately determine where product should be placed.

> MES software can be used in this area to control batching programs and assign them to different machines, as well as collect data for further analysis such as throughput, individual weights, and total batched amounts and weights.

Packing

Packing of final product can be done for primary, secondary, or further processing, and can be completed in different ways. Processors might need to pack product into containers as small as trays or in containers as big as cardboard bins. They may need standalone packing stations, floor scales, or in-line label applicators. Regardless of which product is being packed and which packing methods are used, it is important for processors to manage packing information so that they send the correct product to the correct customer in the correct formation.

> The use MES software for packing is also multifaceted. Processors can also use MES software to assign product to specific packing stations along with information such as pack tolerances and container tares. This information helps operators control giveaway and make sure the correct product is being packed. Operators can also use MES software to assign orders to packing stations, so operators know whom they are packing for and the exact amount they need.



MES software can be used to collect data from the packing stations to determine exactly what has been packed, the total weight, and at what time. This information along with an assigned PackID helps to maintain traceability of final goods as they proceed to inventory or shipping. For in-line label applicators, the MES software can also collect information such as throughput, so processors can measure the speed at which trays or boxes are being labeled.

In the instance of a tray pack line, processors may use an in-line label applicator to label the individual trays then pack the trays afterward into a box. This can be accomplished at a standalone packing station, or trays can be graded much like a piece grader. Using the in-line label applicator and tray grader option allows operators to further control giveaway by matching the expected weight of the box and batching trays to meet that weight. An operator can then record the final weight of the box and label it.

Labeling

> Label design is a very important part of a processing facility for multiple reasons. As mentioned in the Challenges section, changing regulations are a constant struggle for exporting and selling. Having an MES software platform with a flexible label design component helps to ease these pains by allowing changes and updates to existing label layouts. A label design feature also allows processors to customize different label layouts based on individual customer preferences.

Label printing and how it is done can also affect a processor's effectiveness. Many facilities work with pre-printed labels so they do not have to own too many label printers, and to save time when applying labels to finished product. This, however, can lead to more issues with no label auditing such as incorrectly labeled product, no account for giveaway due to the net weight only appearing on the label, and lost time if a label needs to be reprinted.

> It is therefore much more efficient to have an MES software system that supports its own printer drivers for speedy printing, can assign label designs to different printers based on the order and product, allows reprints quickly if a label is damaged, and tracks what label has been printed and where it has been applied. A system like this helps save time and effort, reduces human error, and allows for statistical analysis to make sure the label printing process is as efficient as possible.

The other major purpose for label printing is product traceability. After product has been packed and has exited the processing lines, it needs to be tracked. Labels not only provide a readable sticker to denote what the product is, but also a scannable barcode with lot information, which can be used to scan product to inventory, scan it to a pallet, or scan it to an order. As long as the product is correctly labeled and scanned, it can be located in the system wherever it sits in the facility.

Palletizing

After boxes are packed and labeled, they will often be collected onto pallets for more efficient inventory control, allowing the pallets to easily transfer multiple boxes at a time. This is another reason for labeling packed product. Palletizing can be as simple as using a scanner to scan the box onto a pallet. Once the pallet is completed, it is usually given its own label, so it can be scanned to inventory.

MES software is key for palletizing to simplify the process and to maintain product traceability. If a processor is building pallets, it is another level that they need to keep track of, because it is made up of individual packs. As long as the products were successfully scanned to the pallet and the pallet is labeled and scanned to inventory, the processor will be able to locate that pallet and its contents anywhere in the system.

Inventory

Most product that is packed and shipped from poultry facilities requires time to chill in freezers or coolers before it is shipped. Along with this finished goods inventory, processors may also have a raw materials or dry goods inventory for goods that will be used in further processing, as well as WIP inventories for product that is temporarily stored before being reintroduced to secondary processing or being introduced to further processing. A couple of areas that can also be considered inventories are the staging area before birds are stunned in primary processing and air chillers before birds are introduced to secondary processing.

> Inventory MES software can be used for multiple purposes. The first is traceability as it allows users to know what product is where by scanning product labels and assigning them to an inventory location, even a specific area within the inventory. This allows the picking process to run smoother as users can be pointed directly to a product's location rather than having to search for it.

Inventories and MES software are also used to keep track of what product is on hand with the use of stock takes, so processors can prioritize production orders to produce what is needed rather than what is already in stock. Processors can also use an MES software system to set alarms and notifications to alert them if product has been sitting in an inventory for too long. They can also use this information to direct pickers to product on a FIFO (first in first out) basis to ensure that the oldest product is prioritized, or on a FEFO (first expired first out) basis to ensure that no product expires while in the facility.

Dispatch

The final area for an MES solution is the dispatching or shipping of product to customers. MES software is important for this area of a business for multiple reasons.

> Firstly, it is important for traceability to record what items are going to what orders. Usually this is accomplished by scanning the product or pallet barcodes and assigning them to the order.

This way, processors can perform a backwards trace if there is any issue with the final product once it arrives to the customer, or a forward trace in the case of a recall situation.

> Secondly, it is important to be able to record shipments as 'dispatched' in order to remove products from inventory.

This way the processor can maintain the inventory levels so that they know exactly what is available for sale.

> Thirdly, it is important to generate order fulfillments and send that information to the ERP system, so that the processor can properly bill the customer.

The processor needs to know exactly what was assigned to that order, so that the bill of lading matches exactly to what was picked.

Summary

Not all MES solutions are created the same. Some areas discussed in this document may not be required or important to a specific processor. Therefore, it is important to have a modular MES software system that allows users to select what is needed and what is not. Some processors may need primary processing figures, but do not operate much in secondary. Some processors may receive already slaughtered whole birds and only need to record secondary processing KPIs. Regardless of the type of facility, processors need to maintain and manage processing data in order to secure their facility's future.

MES software solutions are the only way that a poultry processing facility can maintain its place in a business landscape with ever-increasing demands. Specifically, processors need MES software that is flexible, allows for accurate data capture, allows for immediate data access, and can communicate openly to other MES software solutions as needed.