

✓ CHECKLIST FOR MEASURING CURRENT VS POTENTIAL FOOD PROCESSING AND PACKING EFFICIENCY

Improving Processing Baselines for
RTE Meal Portions, Convenience
Food Production, and Fresh
Produce Crop Yields

MARCO[®]
Productivity Improvement Experts

AN **ATS** COMPANY



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Food producers and processors operate in an industry with some of the tightest profit margins. Increased labor dependency in a mature market creates intense competition where most of these companies only generate [12% net profit](#) a year. The unique challenges that face food processors span across the supply chain, from optimizing crop yields to finding production techniques that provide savings when transporting, processing, packing, and shipping products to consumers.

Rising production and labor costs, widespread economic uncertainty, and changing consumer demand are the primary causes of market volatility in the food-manufacturing sector.

Source: [Food Manufacturing Magazine](#)

These shifting market forces aren't the only obstacles to profitability. Manufacturers have to establish real-time traceability over crop yields to limit giveaway from over-packing and ensure compliance with retailer weight specifications. By evaluating the current process against the potential savings available from improved Overall Equipment Effectiveness (OEE), manufacturers can gain advantages that include:

- **Speeding up production and processing tasks while reducing skilled labor dependency**
- **Reducing waste by eliminating over-packing and gaining complete control over the processing operation**
- **Demonstrating that every product lot falls within the Maximum Allowable Variation (MAV) tolerances as set by the FDA or retailers**
- **Increasing profits by reducing transport and shipping costs with accurate weight measurements across the supply chain**

MARCO can save costs by ensuring packing consistency and speeding up production processes for fresh produce, RTE, and convenience food manufacturers.

In this eBook, we provide manufacturers with a checklist of questions to ask when evaluating current operations against potential improvements available from MARCO's productivity solutions.

With MARCO, you can be fast and accurate. Manufacturers don't have to sacrifice production speed or increase giveaway to get their products to retailers on time.

WHEN EVERY MEASUREMENT COUNTS: EVALUATING THE EFFICIENCY OF YOUR FOOD PROCESSING OPERATION

Food waste in the agricultural sector is a global problem. The United Nations estimates that about [14% of crop yields](#) taken during harvest never reach retailers. In the United States, more than [11% of crops are lost](#) post-harvest. While working to prevent food loss is good for sustainability, minimizing giveaway and limiting waste is also the best way to increase profits.

Manufacturers have to maximize the line output of every batch of raw materials they take in if they want to improve the efficiencies of their processing and packing operations. Enhanced process control allows manufacturers to account for losses in yield, manage crop weights where desiccation occurs rapidly, and optimize operations for reduced transport, labor, and shipping costs.

The four categories below enable manufacturers to evaluate current operations against any potential efficiency gains available from MARCO's productivity solutions.

- 1 Measuring and Controlling Raw Material Processing
- 2 Gathering Process Data for Real-Time Operator Feedback
- 3 Demonstrating Retail Weight Compliance for Every Batch
- 4 Automating Optimization across the Manufacturing Supply Chain

In one customer example, by limiting the over-pack of just a few runner beans per package, MARCO provided rapid ROI. They saw massive savings in both product yield and air freight shipping costs.

Jack Lidiard, MARCO



FOOD PROCESSING AND PACKING EVALUATION CHECKLIST

To identify areas where waste and loss occur, manufacturers should take a systematic approach when evaluating operations. The questions below will help uncover those production elements where operators, equipment, or processes could lead to reduced efficiencies.

MEASURING AND CONTROLLING RAW MATERIAL PROCESSING

QUESTION ONE

Are You Monitoring Your Packing Processes to Ensure Product-to-Product Consistency?

Description:

Operators and the equipment they use have a major impact on the line's packing efficiency. Positive scales aren't always the most efficient way to process products, as it requires the operator to select from the raw material, weigh the portion, and then place the correct amount on a tray. The best approach for many products is to use a takeaway scale that calculates the right portion to select from a bulk tote or bin which allows for faster processing and improved product quality due to less direct handling. Improving yield management requires manufacturers to pack consistently within the net weight targets across all of the operator stations. If operators are consistently over-packing, they are giving away too much product. When they under-pack repeatedly, retailers will adjust their payments accordingly or may issue fines due to the discrepancies. Controlling each operator at each station and measuring every batch's total weight according to the raw material allows you to prevent costly over- or under-packing.

Solution:

Producers who utilize simple scales will have a slower processing speed. The need to take a portion, weigh it, adjust (based on the weight value) to reach the required net weight, and then place it on a tray greatly increases each station's efficiency.

MARCO uses smart scales that are configurable for any kind of application. Our takeaway scales let operators know how much raw material to remove from a bulk container, and immediately place it on the tray. By removing these additional processing steps, manufacturers can operate at greater speed without sacrificing the accuracy of their product weights.

Featured MARCO Solutions:



CheckMaster

Comes in a range of models from a tabletop option to a rugged design integrated directly into a fit-for-purpose workstation.

CHECK IT OUT



LineMaster

Provides a mobile workstation with angled or flat scale pans and additional storage options for bulk containers, often used in takeaway applications.

CHECK IT OUT



TaskMaster

Includes the 2nd Generation indicator display with a variety of lightweight, mobile frames for rapid product changeovers.

CHECK IT OUT





Can You Measure the Current Giveaway or Overfill of Your Production Lines?

Description:

It's not enough to provide operators with fast and accurate scales that improve efficiency if you aren't gathering data on each individual's performance. In RTE applications for example, if an operator is consistently overpacking the high-value protein in the meal, you'll see an unacceptable amount of product giveaway with the highest-value product in the meal greatly impacting your profitability. As the productivity of the line depends on the entire labor force, you'll want to manage operators individually at their processing stages.

Solution:

Food manufacturers have to track how much a laborer is picking up and packing to establish what the total crop yield is before starting the packing operation. In processing facilities, the scales should record every individual's contribution to the line's efficiency. This collective data will provide manufacturers with accurate insight into the yields processed and help identify where any losses may be occurring.

With RFID identity management, MARCO provides you with detailed performance data of each operator's individual efficiency. You can identify bottlenecks on the line and take corrective actions instantly if one station is slowing down the process.

Featured MARCO Solutions:



DataMaster

Wall- or stand-mounted color touchscreen display that provides performance data to supervisors who are responsible for the line's efficiency.

[CHECK IT OUT](#)



TechMaster

Graphical indicator solution in the MARCO range for applications where you need to provide detailed information to personnel such as recipe formulation specifications, on-scale training videos with packing instructions, or produce grading procedures.

[CHECK IT OUT](#)



SelectMaster

Uses multiple scale pans with a color display to weigh individual pieces and indicate to operators what combination of portions to select to meet the target weight.

CHECK IT OUT



TRAC-IT

A comprehensive suite of software solutions with various modules that provides end-to-end monitoring, control, and traceability from goods received through to dispatch and helps maximize line performance.

CHECK IT OUT

QUESTION THREE

Do You Know Where the Biggest Sources of Unaccountable Losses Are?

Description:

Manufacturers who don't know where they are losing crop yield or raw materials during the process cannot take corrective actions to increase efficiency. Knowing exactly what is coming off the field and into the packing facility is essential if you want to improve productivity and maintain profitability. It is not uncommon to see a 10 to 15% loss of product in manufacturing environments where the total yield and amount of product processed doesn't match the volume of goods received. These unaccountable losses often occur when individual processes and products aren't closely tracked as goods transfer from one area of the field and factory to another, or when the amount of overpack is excessive to ensure you remain compliant with your customer's weight specifications.

Solution:

Losses and waste can happen at any point in the production and processing operation. To minimize these unaccountable losses, manufacturers have to track the raw material across the production cycle to see where inefficiencies exist. Only once you know where you are losing product can you establish the required control to limit waste and loss.

Featured MARCO Solutions:



Goods Received Module (GRM)

Rapid entry of all products received at the factory that also enforces QC procedures (like First In / First Out) when taking in goods from farms or third-parties and provides true mass balance.

CHECK IT OUT



Average Weight Module (AWM)

Ensures MAV compliance by controlling (instead of monitoring) average weights to maximize profits using a centralized data collection station.

CHECK IT OUT



Yield Control Module (YCM)

Helps adhere to technical specifications by controlling and optimizing weight tolerances while monitoring all operator's performance.

CHECK IT OUT



GATHERING PROCESS DATA FOR REAL-TIME OPERATOR FEEDBACK

QUESTION **FOUR** ✓

How Quickly Are You Validating Portions and Packing Weights on the Line?

Description:

Each measurement task eats into a shift's productivity. To maintain an efficient line, operators have to validate that they are taking off the right weights to stay within the allowable variation between the upper and lower limits. The quicker you can provide the operator with weight feedback, the faster the line will operate.

Solution:

Instead of using a digital display with numbers to help operators validate their weights, manufacturers should deploy improved indicator technologies to provide feedback quickly. With these solutions, anyone can run the line and there is no reading or skill required to remain consistent. Improving the operator feedback solution will increase profits with faster processing, reduced labor costs, and accurate weight processing.

Featured **MARCO** Solutions:



Color-Coded LED Display

Each MARCO scale solution uses a "Green Means Go, Red Means No" LED indicator that shows an operator when they've selected the correct weight or an easily adopted "One Light, One Fruit" methodology.

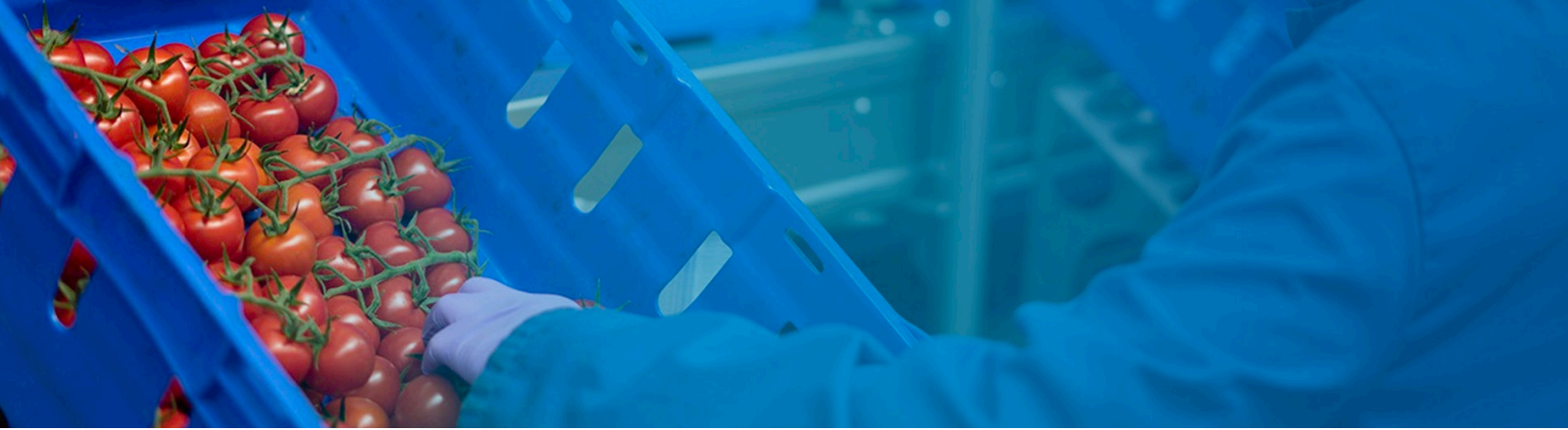
CHECK IT OUT



Secondary Audio Feedback

Audible beeps provide secondary confirmation to operators that a pack is complete to speed up processing and de-skill the line.

CHECK IT OUT



QUESTION FIVE



Can You Gather Performance Insights and Provide Feedback on Each Individual's Productivity?

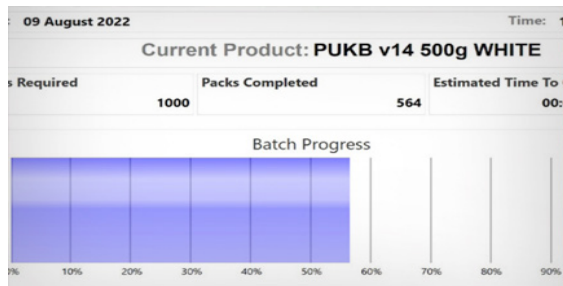
Description:

Processing and packing operations are a team effort but depend on each individual's performance. By not tracking and displaying information, one operator may be underperforming and require the rest of the team to work harder to maintain the required productivity.

Solution:

By collecting the performance data such as the time taken and accuracy of each team member, you can display this information to the group and show where one operator is falling behind. This enables supervisors to intervene if necessary or justify hiring decisions for future shifts. If you know how long a specific production run should take, you can measure where a shift isn't meeting its targets and inform the responsible team members to speed up the process. By monitoring all workers, manufacturers can calculate how best to utilize the workforce for improved performance.

Featured MARCO Solution:



Production Data Display (PDD)

Enables manufacturers to display operator performance to the team, deliver safety information, and show where one person is falling behind and causing the team's productivity to slip.

CHECK IT OUT

QUESTION SIX

Are You Proactively Responding to Product Changeovers to Reduce Downtime?

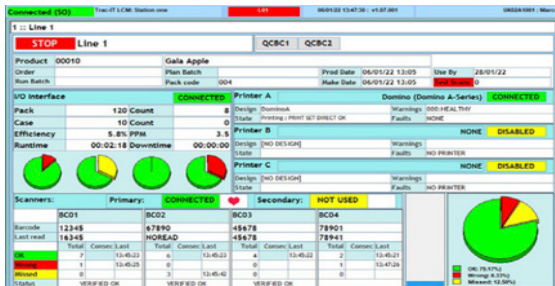
Description:

Any extended downtime to change between product runs will reduce the line's overall efficiency and increase costs. If you aren't proactively planning for changeovers and monitoring the raw product intake through to dispatch, you will increase the downtime required by not knowing the exact time to start the changeover process.

Solution:

Using real-time process data from all stations and the true mass balance of raw materials, manufacturers can calculate when one batch of processing will end and know when to start planning for a changeover. This includes moving operators to different parts of the facility and loading the required batch control programs to reduce the amount of downtime required. MARCO enables manufacturers to set specific KPIs with our graphical displays that include a countdown timer to indicate the exact moment when the line should start a changeover.

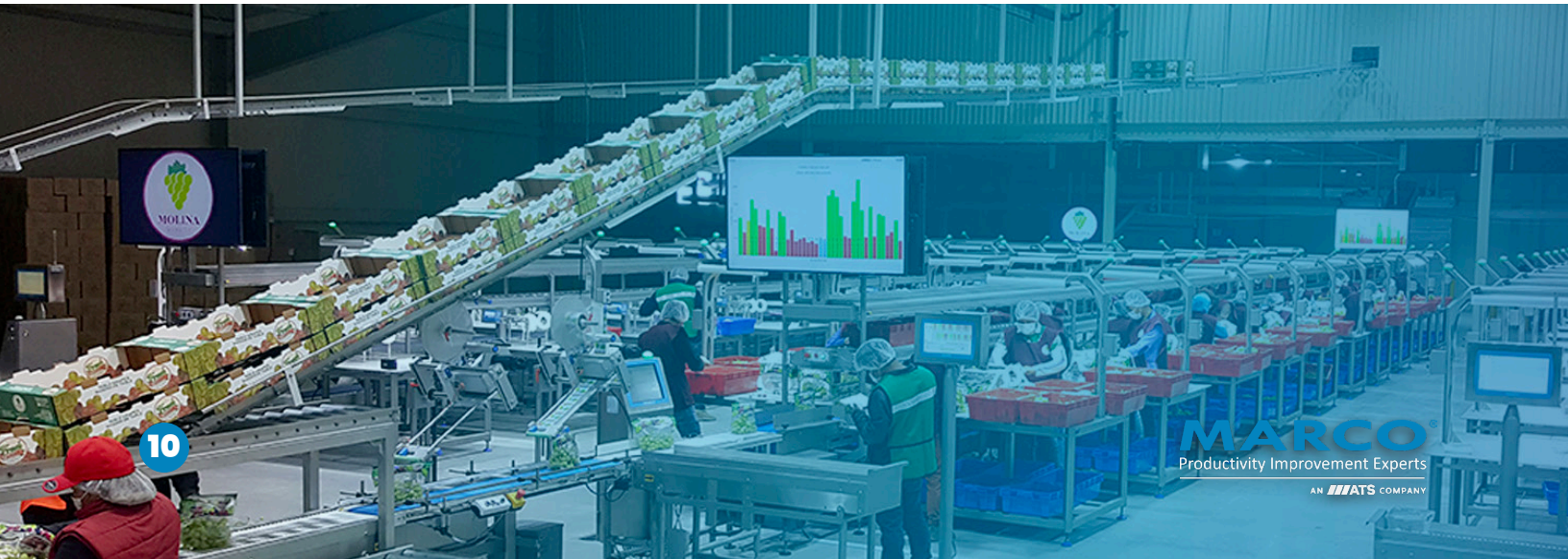
Featured MARCO Solution:



Line Control Module (LCM)

Combined with the data from other software modules, LCM reduces downtime by speeding up changeovers and preventing Emergency Product Withdrawal (EPW) instances.

CHECK IT OUT



DEMONSTRATING RETAIL WEIGHT COMPLIANCE FOR EVERY BATCH

QUESTION SEVEN

Do You Have an Audit Trail for Every Batch of Food You Process?

Description:

The precise and detailed tracking of each operator and package weight reduces the effort required to demonstrate a batch complies with the retailer's specifications. If pallets arrive at the customer and there are significant differences in the shipped weight, it could lead to reduced prices and lost profits.

Solution:

Manufacturers don't have to over-pack and increase giveaway to ensure they meet the required weight specifications. By analyzing specific raw material and crop characteristics with accurate records of each package weight, you can automatically demonstrate compliance and improve efficiency with proactive weight adjustments according to environmental variables.

Featured MARCO Solution:



Data Exchange Module (DEM)

Reduces admin demands by integrating with other business systems and allowing manufacturers to make data-driven decisions based on real-time process information, while automatically demonstrating compliance with customer requirements.

CHECK IT OUT



QUESTION EIGHT

Can You Validate Container and Shipment Weights between Dispatch and Delivery?

Description:

Certain products (especially fresh produce) are prone to moisture loss during transport and shipping. When sending shipments to different destinations, the compliance requirements may change depending on the applicable legislation. To avoid over-packing at a percentage that reduces your profit margin, you should validate the dispatch and delivery weights to ensure you aren't increasing giveaway beyond the exact weight requirements and product type.

Solution:

Tracking the dispatch and delivery weights will indicate where over-packing is occurring and allow manufacturers to adjust their net weight requirements. If a producer is sending 15% more weight to a customer and it arrives at the destination still 5% over, that increases giveaway and impacts your profitability.

Featured MARCO Solution:



TRAC-IT® Modules

The combination of the Yield Control Module (YCM), Waste Management Module (WMM), and Quality Control Module (QCM) provides insights into processes where too much giveaway is reducing profits and allows manufacturers to adjust their shipping strategies accordingly.

CHECK IT OUT

AUTOMATING OPTIMIZATION ACROSS THE MANUFACTURING SUPPLY CHAIN

QUESTION **NINE**

Does Your Manufacturing Execution System Allow for Making Automated Changes in Packing Target Weights?

Description:

Operators come in all shapes and sizes, which leads to different packaging weights coming off the line. If one operator has bigger hands, they will likely over-pack whereas an operator with smaller hands may be packing smaller portions. Physically telling one operator to increase and another to decrease their portions isn't an efficient way to ensure product-to-product consistency.

Solution:

Tracking the different weights per package across all operators provides opportunities for automated optimization on the line. The software will track a specific operator's repeated packing weights and apply new target weights by adjusting the LED indicator's red or green display in the background without any involvement of a supervisor or the awareness of the operations. Manufacturers gain peace of mind that they are always improving the line's efficiency while remaining within the required weight tolerances.

Featured **MARCO** Solution:



Automated Optimization (AO)

With AO turned on, the YCM will adjust the indicators on a scale automatically to increase or decrease the target weights according to the operator's historic data.

CHECK IT OUT

Can You Easily Implement New Software Control or Equipment to Improve Your Packing Efficiency and Scale Production as Needed?

Description:

Implementing new solutions and increasing production capacity is necessary if you want to improve profitability. The equipment and software controls utilized in the manufacturing process can reduce your ability to scale operations and grow the business if they cannot integrate with other solutions or require a skilled labor force to maintain.

Solution:

Modular equipment designs with integrated software solutions enable manufacturers to ramp up production and scale operations on the fly. When manufacturers have to introduce new product lines, it should be easy to set up the process parameters from a central database and push these new programs to the existing equipment.

Featured **MARCO** Solution:



Integrated Equipment and Software Systems

MARCO's range of solutions improves productivity and is easy to scale when the process demands change. With modular systems that adapt to your processing requirements, you can control, monitor, and improve your processing efficiency.

CHECK IT OUT

CONCLUSION

Manufacturers of ready-to-eat meals, convenience foods, and fresh produce have to increase their processing efficiency to maximize profits and reduce waste. MARCO supplies productivity solutions to manufacturers in more than 40 countries, ensuring that each product matches the quality requirements of customers. If you aren't tracking your processing operations in detail, you cannot measure the current efficiency or make improvements that strengthen your bottom line.

To see how MARCO can assist with improving your food processing efficiencies, [request an evaluation](#) from the productivity experts today.

FOOD PROCESSING AND PACKING EVALUATION CHECKLIST

MEASURING AND CONTROLLING RAW MATERIAL PROCESSING

QUESTION ONE

MARCO YOUR CURRENT OPERATION

Are You Monitoring Your Packing Processes to Ensure Product-to-Product Consistency?

notes:

QUESTION TWO

MARCO YOUR CURRENT OPERATION

Can You Measure the Current Giveaway or Overfill of Your Production Lines?

notes:

QUESTION THREE

MARCO YOUR CURRENT OPERATION

Do You Know Where the Biggest Sources of Unaccountable Losses Are?

notes:

GATHERING PROCESS DATA FOR REAL-TIME OPERATOR FEEDBACK

QUESTION FOUR

MARCO YOUR CURRENT OPERATION

How Quickly Are You Validating Portions and Packing Weights on the Line?

notes:

QUESTION FIVE

MARCO YOUR CURRENT OPERATION

Can You Gather Performance Insights and Provide Feedback on Each Individual's Productivity?

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QUESTION SIX

MARCO YOUR CURRENT OPERATION

Are You Proactively Responding to Product Changeovers to Reduce Downtime?

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DEMONSTRATING RETAIL WEIGHT COMPLIANCE FOR EVERY BATCH

QUESTION SEVEN

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Do You Have an Audit Trail for Every Batch of Food You Process?

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QUESTION EIGHT

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AUTOMATING OPTIMIZATION ACROSS THE MANUFACTURING SUPPLY CHAIN

QUESTION NINE

MARCO YOUR CURRENT OPERATION

Does Your Manufacturing Execution System Allow for Making Automated Changes in Packing Target Weights?

notes:

QUESTION TEN

MARCO YOUR CURRENT OPERATION

Can You Easily Implement New Software Control or Equipment to Improve Your Packing Efficiency and Scale Production as Needed?

notes:

