



EXCELLENCE IN VEGETABLE PACKING

Driving Efficiency and Excellence in Vegetable Packing

As consumer demand for year-round, pre-packed fresh vegetables rises, pack houses face increasing challenges in optimising productivity, reducing waste, and meeting the high standards set by major retailers.

The global production of vegetables has increased significantly over the past few decades, from 682 million metric tons in 2000 to 1,173.07 million metric tons in 2022 - although it is very difficult to put a figure on how much of this market is serviced by pre-packed product.

The growing variety of pre-packed vegetables, with their wide range of shapes and sizes, places increasing pressure on the manual packing process, which still relies heavily on the skill and consistency of individual packers.



Vegetable pack houses have traditionally used standalone digital bench scales to monitor pack weights. These scales are relatively slow and do not provide real-time data for assessing individual operator performance. Trying to minimise the number of underweight packs usually means that line speeds are only achieved at the expense of significant giveaway/overpack.

The real challenge lies in optimising throughput productivity without sacrificing quality or efficiency.

The Solution

Fortunately, modern packhouse productivity systems have been specifically designed to offer intuitive operator interfaces alongside advanced data capture capabilities, providing the visibility and control needed for efficient packhouse management.

Companies that have invested in these [yield control systems](#) are now gaining a competitive edge, streamlining operations, reducing waste, and improving overall performance.

These systems enable [real-time insights](#), helping businesses stay ahead in an increasingly demanding market.



"When you're packing over 45,000 punnets of mushrooms a week, every gram of giveaway has an important affect on profitability. Although we are a relatively small company we are prepared to invest in the latest technology to remain competitive. However, we need to be sure any investments provide a secure and rapid return. I am amazed at the improvements we are seeing. Not only has our giveaway dropped from double digit levels to fractions of a gram, but also our productivity has improved significantly without any impact on quality. This is good news for us and our customers."
Smithy Mushrooms, UK

Reducing Giveaway/Overpack

Any yield control system must be easy to use by operators. Evidence shows that operators quickly respond to the [MARCO Yield Control Module \(YCM\)](#), which includes a simple traffic light system incorporated within the weighing scale. This is used to indicate whether pack weights are under, above or on target.

MARCO have taken this concept one major step further, whereby each light segment on the visual traffic light display represents a single vegetable. Operators are simply prompted to add or remove one or more vegetables to ensure weight compliance. Each operator will have a slightly different packing technique which, if unchecked, can result in out-of tolerance packs.



Installations clearly show that this feature significantly increases the speed of the packing process and is ideal for vegetables where the individual product weight is fairly consistent. The terminals can be pre-programmed to store weight values for different types of vegetable, making pack line changes very simple and rapid.

As pre-packed vegetables travel down the packing line, they are placed on the scale where operators are visually prompted to 'add' or 'take out' individual vegetables to ensure the pack weights are within target. This clear, visual method of indicating target weight compliance significantly reduces operator training requirements.

"Our range of fresh produce is not the easiest to pack and maintaining target weights within legislative requirements can be difficult. The MARCO Yield Control System has reduced our giveaway dramatically, whilst our productivity has improved."

"Our operators find the systems easy to use and minimum training is required. With regard to the monitoring of waste, we now know when and where waste is produced and by whom. This allows us to fine tune our operation and optimise costs."

Barfoots, UK

Predictive Packing

Packing line speeds and therefore productivity, are dependent on a wide range of factors, including the weight consistency of pre-packed products coming in from the pre-pack areas. Reducing the number of packs requiring weight adjustments on the line has a direct and positive impact on productivity.

This can be achieved through the use of a real time feed back system from each of the packing scales, using an easy-to-read coloured light system. This clearly highlights if packs arriving at the downstream scales are 'too heavy' or 'too light', allowing rapid adjustments to be made in the prepack area. This ingenious system significantly reduces pack weight adjustments needed on the line.

"The MARCO systems have brought rapid and important improvements to our packing processes and we have had no hesitation in implementing this further investment. Operators find them very easy to use and the mobility of the stations means we can easily configure lines to meet rapidly changing order requirements. Our overpack has reduced to almost zero and this is now becoming evident in our reduced airfreight costs."

Kenya Horticultural Exporters Ltd, Kenya



Mass Balance and Security

Mass Balance

The ability to measure the actual usage of product, from initial issue to the lines through to finished packs provides critical information on the overall effectiveness of the pack house and can be used to check the efficiency of individual packers/operatives. Although waste is inevitable in the modern pack house environment, companies can improve competitiveness by minimising the impact on their business.

There are essentially three sources of waste generated within the pack-house:

- Accumulated product at work stations that can be re-used
- Damaged/unusable waste product that has to be thrown away
- Unnecessary giveaway/overpack in finished packs

By using platform scales and barcode scanners located at key areas of the pack house, combined with data from individual packing stations, over-all waste production can be accurately measured.

Firstly, the system records the total weight of product issued to each packing line in a given time period. Recorded data can include time & date, product description, batch/lot number.

Secondly, the two types of accumulated waste product (reusable and scrap) at each of the packing stations are weighed and recorded, including operator identity.

Finally the total weight of finished product packed within the measured period is recorded.

From this information, together with pack weight trends recorded at the individual work stations, the system calculates overall waste production per line/

per operator and levels of over-pack/giveaway to give an over-all real time mass balance for the pack-house.

Such mass balance information is particularly useful for contract packers. The data gathered throughout the pack house can be used to show individual growers how efficiently their particular produce has been packed.

Security

Pack house operators are usually paid on a productivity basis, the more product they pack in a given time, the more they get paid.

However in some instances this can lead to operators trying to unfairly increase their productivity by weighing the same pack more than once or allowing out of tolerance packs to go through.

This can be prevented through clever software, which records and compares each pack weight at individual packing stations. Bogus weighings (e.g. successive identical weighments) are instantly detected and flagged up to supervisors.



"We operate a dynamic packing operation where time is of the essence to maintain all round freshness. We have to balance speed with accuracy and pack appearance. The MARCO system allows us to maintain this delicate balance with the benefits of significantly reduced giveaway and improved productivity."

Kenya Horticultural Exporters Ltd, Kenya

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