

-ARCO

Weighing mushrooms

White paper | 2021



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Weighing mushrooms: An introduction

Weighing mushrooms is one of the most important links in the entire processing chain. Each punnet is weighed and packed separately. This is a laborious process in which the operator has a key role to play. Operators are responsible for ensuring that each punnet contains the minimum weight and that they don't exceed this minimum by too much. In reality, however, many of the punnets are overfilled. That might not sound like a big deal for a single punnet, but if you extrapolate that across the total production run, the supplier can end up losing a lot of money because too much product is given away for free.

Both the way in which the operator works and the resources that they use have a huge impact on the result. Accurate weighing can result in immediate, significant cost reduction.

The speed at which mushrooms are weighed can directly generate high yields. Using the right weighing and transport equipment has a huge impact on results and, therefore, on the financial returns. In addition, logistics routing plays a vital part in optimizing the number of operator movements.

This white paper focuses on the optimization of the weighing process, ensuring that giveaway weight is kept to a minimum. The consumer packages used are generally punnets that can hold between 100 and 1000 grams. At least 100 mushrooms are weighed per minute on the PM2020 HC (large weighing line), and at least 60 per minute on the PM2020 MC (small weighing line).

**Lack of efficiency, too much
giveaway weight**

Limited staff, **high workload**

For many mushroom growers and packers, staff availability is a major challenge; limited staff availability creates huge pressure on the shop floor. Deploying more employees who work shorter shifts creates problems both in terms of organization and costs.

Inefficient movements of employees and/or products

In many production environments, limited space or an illogical set-up leads to widespread inefficiency in employee and/or product movements. In many cases, operators are only effectively weighing and packing mushrooms half the time. The remaining time is spent dealing with peripheral issues such as supplying new mushrooms and removing empty containers.



Significant amount of overweight in mushroom

Most mushroom crates or punnets with the finished product end up with excess weight – the number of grams in the pack is more than the minimum required. This excess weight is often not paid for by the consumer, meaning that many kilos of mushrooms are effectively being given away for free every year. Some producers can live with an average excess weight of 10% per pack.

Limited quality and productivity control

A lack of data means that there is too little control over quality and productivity. It is difficult to check how accurately operators weigh the punnets. Productivity per operator is also tricky to measure, which can affect the amount of giveaway in the punnet and the total capacity.



Too many employees in one place leads to inefficiencies

If too many employees are required to achieve a certain capacity, this will result in inefficiency. More people in the workplace create congestion, which automatically results in more downtime. To compensate, even more staff are needed, which increases inefficiency further. Inefficiency drives up wage costs, which in turn increases the price.



Work smarter, not more

Make weighing **less labour intensive**

Weighing can be made less labour intensive by partially or wholly automating how the product is fed into the process. Each crate or punnet can be automatically placed on a scale without any input needed from an operator. The weighing unit itself can also be a factor in reducing labour intensity. If the weighing unit shows at a glance what adjustments need to be made to the weight, the operator can act more quickly; if it visually displays what needs to be done (e.g. add or remove one mushroom), it reduces the thinking time required for an operator, which means that they can react up to 20% faster. This significantly increases the efficiency of the operation.

The process can also be made less laborious by automating the extraction of the finished product. Once the correct weight is reached, each crate or

punnet can be transported from the scales completely automatically and moved to the next station in the packing process.

In addition, empty containers can be removed automatically, using conveyor belts to extract and stack them without manual input. This boosts operator efficiency significantly.

These measures will reduce the overall workload placed on the operator, so they can then spend more time actually weighing the punnets and less time performing peripheral tasks such as feeding in and extracting containers. A smart set-up ensures that every action is performed logically and efficiently.

Optimize productivity and reduce the number of employees

Determining the right logistics routing in the weighing and packing room has a major impact on the number of operator movements and, in turn, on productivity. Correcting an existing set-up can help to reduce many inefficient movements in a process.

By using proper routing and weighing equipment, the number of employees can be greatly reduced, while maintaining or even increasing capacity. Conveyor belts and the right weighing machine can take a great deal of work off the operator's hands. It also reduces errors, freeing up more time to correct the weights and making weighing less laborious.

Reduce overweight per punnet

Software that uses big data can help to reduce excess weight in every crate and punnet. When combined with advanced weighing machines, this tells an operator how much product should be taken out of the punnet to get as close as possible to the minimum weight. In this way, big data continuously helps to achieve the minimum weight and deliver maximum savings. Using advanced weighing equipment is essential to reducing excess weight, which, in turn, helps producers to save significantly on product losses.

State-of-the-art weighing equipment **increases capacity**

As state-of-the-art equipment weighs each pack automatically and immediately indicates how the operator can reach the ideal weight, this boosts your production capacity. ARCO systems allow the operator to manually adjust the weight of the punnets that have not achieved the desired weight. A single operator can weigh up to 100 punnets per minute and ensure they are the correct weight.

Encourage ergonomic working processes - reduce absenteeism and downtime

Physical work and exercise are good for employees, as long as the right posture is maintained and a pleasant working environment is fostered. Downtime and staff absences can cause problems and prove costly. The right posture at work and alternating between tasks both help to reduce absences. Other advantages include:

- Operators can easily alternate tasks on a weighing line
- The work is not draining
- Maximum flexibility is made possible

Payback period (ROI) as an indicator instead of investment costs

Calculating the payback period (return on investment) based on the total investment cost gives an indication of the long-term financial impact of the investments. Good investments can be recovered within a short amount of time by achieving higher capacities or reducing the number of employees required for the overall process. When considering an investment in weighing and packing mushroom, the following key indicators should be taken into account:

- Change in capacity in numbers
- Change in percentage of giveaway
- Change in operator hours or total labour costs
- Total investment costs

Data-driven efficiency

Data can be harnessed to drive efficiency on the shop floor and optimize the weight per punnet. The check weighers and/or the weighing unit provide the data, which are translated into useful data with the help of software applications. This reveals where improvements can be made or where delays occur the most. Additionally, data on the weight of the punnets can also help the team, as they then become aware of when the average weight is too far above or below the target weight.

Result of ARCO's weighing line

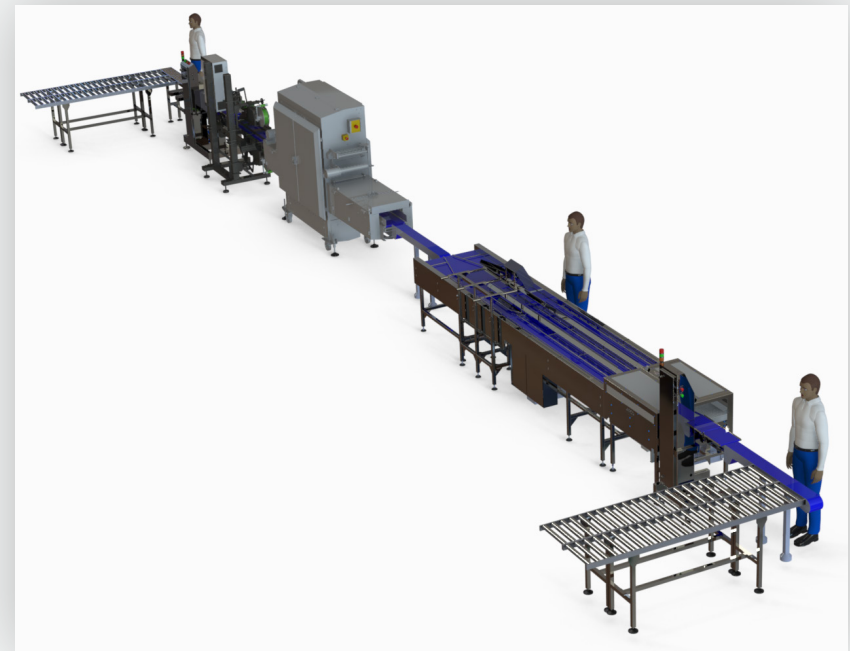
More **efficient** weighing

An ARCO production line including a weighing system allows employees to focus more on weighing and spend less time on peripheral tasks. The automated supply of full crates and extraction of empty crates means that operators do not need to perform as many actions, which means they can spend more time weighing the product. Since ARCO's weighing system visually displays how much product needs to be added to or removed from the punnet, operators can work faster and more efficiently.

The same – or better – results with **fewer employees**

ARCO's line maximizes the automation of the product weighing process. An operator is only required to adjust the weight of a punnet, if necessary. And because the operator doesn't have to perform as many actions themselves,

they have more time to focus on weighing. When developing a line, ARCO also takes into account the correct logistical routing in order to avoid ineffective movements.



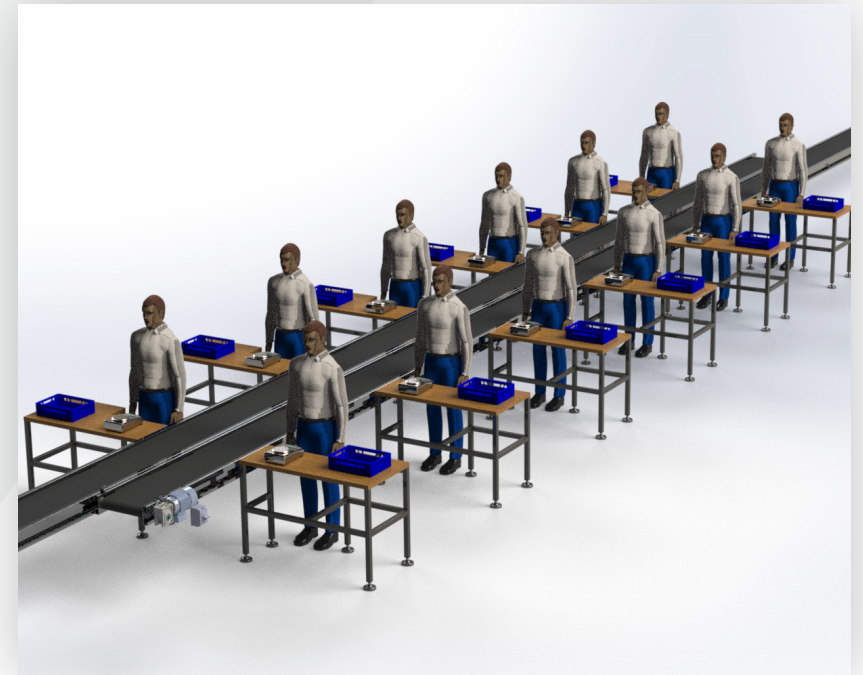
Future with intelligent weighing line

Increased capacity and **reduced giveaway weight**

ARCO's measurement solution makes it much easier for operators to ensure that each punnet contains the correct weight of product, since it visually displays what the operator needs to do. In turn, operators can accurately weigh more punnets per minute. Furthermore, the data collected within the line provides insights into the average weight leaving the warehouse, and operators can use that data to fine-tune their tasks.

Fewer absences **and downtime**

Production lines that have been designed with the operator in mind ensure that operators can work ergonomically, thereby reducing absences and downtime.



Past without intelligent weighing line

Need help with a technical issue?



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