

# Tasco

## Automation delivers food packaging benefits



In supplying pre-packed goods, giveaway – the amount by which a pack exceeds its nominal weight – is a constant concern. This was certainly the case for TASC0, one of the UK's leading suppliers of brassicas, when the company changed to punnet-free packaging. A refurbished weigher, in conjunction with a novel automation system based on equipment from Omron, provided the solution.

Reducing the amount of packaging used for products like vegetables is, in this environmentally conscious era, a priority for supermarket buyers and customers alike. But significant challenges often need to be addressed in order to achieve these reductions, as T A Smith Limited, otherwise known as TASC0, recently discovered.

TASC0 is one of the UK's largest suppliers of pre-packed vegetables to major supermarkets. The company's speciality is brassicas, in particular cauliflower and broccoli, although it can also include other vegetables, such as carrots, in its packs.

Always looking for ways to provide its customers with improved products and service, TASC0 was receptive to a request from Somerfield to investigate the possibility of supplying vegetables in bags, rather than in flow-wrapped punnets. Eliminating the punnets while minimising giveaway was far from trivial, however, as the punnets were integral to the manual packing process then in use.

With the manual system, giveaway was essentially under control of the plant operatives. Cauliflower florets, for example, weigh anything from around 30g to 70g. In theory at least, an operative filling punnets manually can, therefore, choose the size of the last few florets to make sure that the pack comes out close to the correct weight.

This manual selection of floret size clearly can't be incorporated into an automated packaging system. Correct pack weight is, however, very important – it is illegal to sell underweight packs, but overweight packs damage profitability.

The second problem with automated packaging is that cauliflower florets in particular are very susceptible to bruising. Tests carried out by TASC0 on commercially available automated packing machines revealed that their vibratory feeders damaged the product to the extent that the shelf life of the packs was reduced by at least a day, which was completely unacceptable.

The first step toward a solution was the discovery by TASC0's engineer that programmable controllers (PLCs) from OMRON can easily be connected to the load cells used by electronic weigh pans. This led to the idea of rebuilding an existing multihead weigher which TASC0 rarely used, and combining it with a bagging machine to produce the new punnet-free packs.

Prior to modification, the weigher had 10 weigh pans, all fed by vibratory feeders. While all of the weigh pans were retained, TASCO replaced four of the vibratory feed lanes by conveyors. These are used for the delicate cauliflower florets and, although they have lower throughput than the vibratory feeders, they completely eliminate bruising.

Four of the remaining lanes are used for broccoli, which is less susceptible to damage, and one is available for use with carrots which are sometimes included in mixed packs. The remaining weigh pan is used to check weigh the packs after filling.

The TASCO development team wrote a program for an Omron PLC which looks at the weight of four pans containing a particular product, either broccoli or cauliflower. The PLC then decides which of 15 possible combinations of pan contents should be tipped into the bag to produce a pack which is as near as possible to the target weight.

While this system was entirely satisfactory in operation, extensive trials showed that the results it delivered were no better than those achieved by using the weigh pans individually, and optimising the weight by dribble-feeding the product as the correct weight was approached. As this simpler arrangement also gave a useful increase in throughput, it was adopted for normal use.

As part of the machine upgrade process, TASCO fitted an electronic HMI unit, also from OMRON, to provide the operator interface. This unit has a colour touch screen capable of displaying detailed graphics and, by showing the operator exactly what's going on at all times, in a form which is readily understood, it makes machine operation easy and intuitive.

The HMI also continuously displays realtime information on machine performance allowing, for example, the weight of packs to be constantly monitored, and it collects and analyses production data. This means that important parameters, such as giveaway, can be checked quickly and easily.

In addition, TASCO has implemented powerful diagnostics facilities using the HMI and the PLC which mean that, in the event of a machine fault, costly and inconvenient downtime is kept to a minimum.

In operation, the new machine is delivering a range of substantial benefits. Throughput is typically between 1,200 and 1,500 packs per hour, and is limited not by the weighing system, but by the bagging machine. This operating speed, which has been optimised to prevent bruising of the cauliflower, is up from 600 packs per hour which was the maximum possible with manual packaging in punnets.

Just as important, the machine now only needs four operators when dealing with single-product packs, or seven operators for multi-product packs, compared with the twelve operators that

were always needed for manual packing. In addition, the giveaway has been cut by around 50% compared with manual packing.

Flexibility is also maximised, as the PLC has been programmed so that the machine can be instantly switched from packing single products to packing mixed products in bags or strip packs. To make the changeover, operators simply touch the required option on the screen of the HMI.

A further bonus is that the conversion of the existing weighing machine, including all of the Omron hardware, the mechanical modifications and the purchase of a second-hand bagging machine, cost only about one-quarter as much as buying a brand new bagging and weighing system. And, of course, the converted machine provides the gentle product handling which TASCO was unable to replicate with any commercial system.

"With our converted and upgraded weighing and packing system, the development of which was made possible largely by products and support from Omron, our packaging costs are now just one third of what they were when we were packing manually," said Andy Toyne, TASCO's Production Director, "and, of course, our capacity has doubled."

"These factors, coupled with the reduced environmental impact of the punnet-free packaging and the machine's gentle handling which safeguards the quality of the product, are giving us a really big commercial advantage," he continued. "In fact, other major supermarket chains are already very interested in our bag-packed products, and we see a lot of potential for future expansion in this market."

Following its unsuccessful search for commercial weighers that combine high throughput with gentle product handling, TASCO is considering producing further machines, not only for its own use, but also for sale to other food packers.

"Starting from scratch, we know we can achieve even better performance and flexibility," said Andy Toyne, "especially when you consider that a single OMRON PLC is capable of handling up to 100 weigh heads simultaneously and that both the PLC and the HMI unit can be programmed to provide almost any required functionality. Developing a completely new machine is another exciting challenge where we shall be working very closely with Omron."