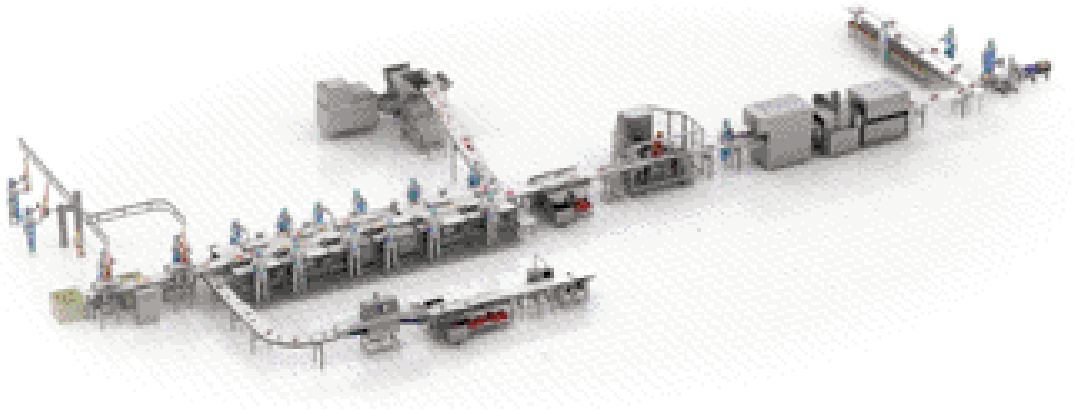
Taking the guesswork out of meat processing

by the technical team, Marel.

The food industry is experiencing pressure from powerful retailers for lower prices as well as better and more uniform product quality. At the same time, competition is increasing because of globalisation and companies merging.

Profit margins are under such pressure that it only takes small 'mistakes' before black figures turn into red. In order to survive in this competitive and financially difficult marketplace the ability to efficiently control, monitor and measure virtually every aspect of the processor's shop-floor operations is an absolute necessity.



StreamLine – Marel's beef deboning and trimming system.

Monitoring profitability

Beef processing companies are increasingly focusing on key performance indicators (KPIs) that are crucial pointers for how effectively their plant is running. The KPIs are typically yield, throughput, quality, production control and stock management.

Since 70-75% of the cost of the final product stems from the raw material, it is vital to closely control the actual yield against the expected.

Even very small deviations in percentages between the actual and the expected yield can have a substantial financial impact on the profitability of the business, because of the ever increasing tonnages being processed. By implementing a reliable real-time yield management system many meat companies can improve profitability significantly.

A 1-2% increase in yield on the high value primary product would in many cases mean a payback time for the implementation costs of less than 18 months.

From intake to dispatch

StreamLine, Marel's comprehensive and state-of-the-art beef deboning and trimming system, enables processors to online monitor and control the production from carcase intake to product dispatch.

Carcases from stock are weighed-in on an overhead track scale, where information about each animal such as animal ID, age, slaughter date, farmer, pH value, etc, is captured by the Innova production control software system.

Subsequent to that, the carcases are cut down according to individual specifications and weighed before entering the StreamLine for deboning/trimming.

Primals are distributed to work stations on the StreamLine, based on operator availability. Products are deboned, trimmed and skinned, according to individual specifications indicated on the terminals.

All cuts are fully traceable and yield, throughput, quality and other KPIs for each operator are registered and monitored online.

After deboning and trimming the primals are automatically distributed for individual or bulk packing in bags, and subsequently boxed, registered, labelled and sent to stock or dispatch.

Hot deboning facility

Having seen the difference that a Marel StreamLine system made to production at their Hamilton-based deboning and trimming plant, Greenlea Premier Meats in New Zealand wanted to implement a similar system in their hot deboning facility in Morrinsville.

Installed in 2011, the new Marel StreamLine system for monitoring and controlling the production of

Continued on page 15

Primals are distributed to work stations on the StreamLine based on operator availability.

The Innova production control system enables individual traceability on every part, as well as monitoring of yield, throughput and defects.

Continued from page 13
hot deboned beef gives Greenlea the absolute world lead in hot deboning.

Russell Shaw, the plant manager at Morrinsville was the leading figure in getting the system into operation.

"We really and truly believe in it," Russell told International Meat Topics. "I admit I was rather sceptical when we installed the StreamLine system in our cold deboning and trimming facility in Hamilton, but seeing the results has turned me into a true believer. The system has delivered what was promised and probably much more, and I am in no doubt whatsoever that this was also needed in our hot deboning facility."

Some of the results referred to by Russell at Greenlea's Hamilton facility include yield increase, performance gains, increased output and full individual operator monitoring.

Similar improvements have been experienced in the Morrinsville facility, where 250 head of cattle are processed on each shift, equalling 500 head every 24 hours.

Believing in innovation

Greenlea is a forward looking company, constantly on the look-out for innovations and improvements in processing. One way of achieving this is by working closely together and forming a partnership with Marel.

"We learned a lot from the first system, which has been of benefit in designing the second line. Flexibility of this kind is a big part of what our partnership with Marel is about," Russell added.

The TargetBatcher is a unique weighing machine that combines a predetermined number of fresh or frozen products into a package with an exact weight. With seven high accuracy individual scales and 14 holding bins, it only takes a fraction of a second for a TargetBatcher to select the optimal combination of products to achieve any pre-set weight for the batch. Meat items ideally batched with the TargetBatcher include marinated meat strips, cutlets and spare ribs.

Online monitoring

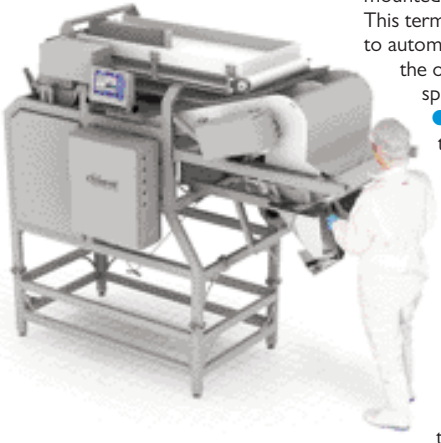
With Marel's deboning and trimming system the entire production process is monitored by Innova deboning and trimming software.

The module is supporting the Marel StreamLine and all processes in front of and subsequent to the line including weighing, grading, portioning, quality assurance, inventory and dispatch.

The deboning and trimming module has been designed with the following main features:

- Individual traceability on every part. Innova keeps track of an animal through all processes such as deboning, trimming and packing. All parts leaving this area can be identified with labels tracing back to the original animal and lot.
- Real-time instructions. At the deboning and trimming station a compact ergonomic terminal is mounted in front of the operator. This terminal is used by the system to automatically inform and instruct the operators about tasks and specifications.
- Monitoring of yield, throughput and defects. Standard yield and throughput results are stored in the system for all tasks. Operators are monitored, in real time, on their performance which they can check themselves at all times.
- Integrated quality control. Inspection procedures can be configured in the system for all products produced on the line. The system randomly guides products to operator stations identified as quality control stations. Defects are identified, optionally valued and a notification given online to the operator that caused the defect.

The SpeedBatcher system can create batches at very high speed. The SpeedBatcher automatically weighs raw material into sub-weights that are then selectively combined to form the optimal batch weight. This capability means the SpeedBatcher outperforms all conventional bulk packing systems in terms of both speed and accuracy. The unit is fully automatic – from input to outfeed. Meat items ideally batched with the SpeedBatcher include organs, by-products, frozen diced meat and frozen breaded products.



Fixed weight packing

Products from the StreamLine may be sent directly to dispatch or taken out for fixed-weight case ready packing. Fixed weight tray packing is steadily becoming more and more popular – and is on the agenda of many meat producers.

The benefits of fixed-weight batching are many. It is especially important for meat processors to keep giveaway as low as possible when packing their products, yet ensuring an exact target weight to be delivered to the customers.

High speed portion cutting of virtually any boneless beef product with maximum weight accuracy may be performed by one of Marel's I-Cut portioners.

For accurate fixed weight packing the robot batcher, using vision camera technology, automatically sorts, styles and loads beef products of varying weight into trays with predefined fixed weights.

The fixed weight trays are top sealed, check weighed, price labelled (up to 160 packs/minute) and packed into boxes or crates.

All boxes pass a box registration and labelling station after which each box is allocated to a unique position in the stock hotel, based on the weight and the box and product ID, or sent directly to palletising and dispatch. The benefits of fixed weight tray packing are primarily found in retail. In the supermarkets the handling of the meat products becomes easier, as the consumers do not have to look through several packs with variable weight to find the one that suits their needs. Now the supermarket typically has 2-3 set tray sizes (small, medium and large) with a fixed weight – matching the needs of a standard consumer's household.

Assessing stock value

Another big advantage of fixed weight tray packing is found in the logistics of the products. The sizes and weight of the trays on a certain pallet is known – so when a product needs a price change the bar code is changed once in the central system, whereafter the system knows that all identical products have that particular price.

This means that one can easily decide the change of stock value due to the price change. Today the store manager often has to make a calculation of each individual tray to decide the price change, and then afterwards calculate the total stock value change.

When packing meat to fixed weight, the processor is paid by the supermarket for the fixed weight printed on the packs – not the nominal weight. Thus, it is important to the processor to reduce the overweight to an absolute minimum. The wide range of portioning and batching systems from Marel will batch fresh or frozen meat items of almost any size into fixed-weight packages.

The Multihead Weigher deals with all infeed, mixing and weighing requirements. It automatically portions and packs food products into virtually any kind of tray, thermo pack, bag, can, glass or box. The products are dispensed into hoppers by vibrating feeders and weighed into exact portions. Meat items ideally batched with a Multihead Weigher include IQF meat toppings, meat balls, bacon dices and other retail products.

All batchers live up to the most stringent food industry requirements, thanks to their versatility and easy-to clean designs. The fixed-weight batchers can operate as stand-alone units or be integrated into a complete packing line. ■