

The key to adding yield value in cut-up and deboning operations

Technology advancements in processing plants have always been the catalyst for major advances in cost reduction, quality and yield improvement as well as providing the ability to offer new and innovative products. While the main focus has been around the primary plant steps of slaughter, evisceration and chilling in recent years, much of the emphasis in broiler plant technology has shifted to the after-chiller process.

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The traditional slaughter processing steps will always be vital – but the automation and technology in the second processing areas of the plant have helped create better flow, more product choices, and improved food safety.

Demand for innovative products

Because of changes in demographics, lifestyles, consumer values and economic conditions, today's consumer – and rightly so – takes the basic attributes such as food safety and correct labelling as a given.

Now they are looking for more innovative products that have healthy attributes, smaller portions and convenient preparation. To accomplish this at a competitive cost, producers have been forced to look at new alternatives.

Poultry plants span a wide range of automation levels ranging from almost all manual processes – much the same as in the 1970s – to fully automated lines and every stage in between.

Many plants are using hands-off, vision grading technology to direct birds to high-speed portioning, sizing and packaging equipment.

This technology sometimes includes intelligent mechanical or water jet portioning. It can also be combined with weight measuring and vision systems that communicate with robots to automatically



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pack the best combination of pieces to ensure weight compliance with minimal giveaway.

Almost all plant environments have transitioned from the old-style metal detectors to the new X-ray systems for foreign material control. The technology can flow all the way through to the packaged product where in some plants product is being auto-packed in cases that are auto-stacked by robots.

The technology level is determined by many individual factors such as regional government regulations, labour cost and availability, product mix sophistication and the financial resources.

Make the right choice

It is imperative to make sure it is the right fit for your individual situation. Regardless of what the equipment salesmen may tell you, it is not one size fits all. Each plant must look at its own individual situation.

For example, plants that debone 100% of the breast would have a much different set of factors to consider in an area of the

United States with a stable and plentiful labour force than a plant in Canada, Europe or South America with a limited labour pool and very different product mix requirement.

Most of the US big bird deboning plants have made the decision to manually debone because of up to 2% increased yield compared to automated systems. This comes from meat on the pulley bone, wing tabs, rib meat and eye meat that is very difficult for automated systems to harvest.

Also the US plants usually have high value product mixes that makes it profitable to take all the breast meat off the shell and then process the shell through a meat recovery system.

In a company using automation the yield loss may be offset by labour cost or inability to get labour. Also the plant may have a product mix that demands no rib meat or wing tab meat left on the fillet. If the plant does not have a high value product for the trim, it would be more profitable to leave the rib and eye meat on the shell and remove it with automated meat recovery.

Continued on page 9

Continued from page 7

Both scenarios would be correct choices for the different operations; always consider the bottom line when planning process changes.

Streamline your operation

Automation, in almost all instances will prevent bottlenecks and help streamline an operation. When comparing yield, quality and food safety between a highly automated line (using a good overhead cut-up system and transport systems to take the product through to final pack), and a plant that is not inline and run as separate batch operations, the streamlined plant will always win.

Labour can be used more efficiently, and the better flow will also improve yield, less product loss, and shelf life. For example, a batch process can not control the first-in first-out concept as can technology with moving conveyors or lines.

Some product may sit at the bottom of a tub or pile for an extended period of time, which always represents yield loss, while an inline conveyor or overhead line will keep moving product down the line at a regulated rate.

This allows management to control the speed, throughput and work pace of the labour force. With a batch process, people can work at their own speed which may slow down overall flow, labour utilisation and plant efficiency. People working in this manner are usually on static surfaces like the conveyor sides, on tables, atop crates or on cutting boards, which all make an ideal situation for bacteria growth.

To prevent this you must develop a process to make sure that the people's hands, tools and equipment, as well as the cutting surfaces, are properly and regularly cleaned. Also birds that are piled and bottlenecked will have excess water loss and floor shrink due to simple compression and gravity.

Successful integration

Another vital part of using technology is integrating the process with other technology to ensure overall success. Especially with the automated cutting of whole birds and deboning of breast fronts or caps, the total process design can make a significant difference to results.

The automated cut-up and deboning systems cannot adjust to each bird. The equipment is set for a specified weight range; therefore, the uniformity of the parts to the machine will be a major factor in its performance level.

For many years we have sized birds after chilling for the fast food cuts, both manual and automated, to meet customer requirements.

The major problem is in plants that load



The high degree of uniformity of these Cobb500 broilers is a major benefit in highly automated processing.

automatic deboners while using un-sized, random birds, which will result in poor performance of the machine, parts damage, and yield loss.

If not cutting a specific bird size to meet portion weights many companies still rely on the uniformity of the live weight as the controlling factor.

This is not best practice to ensure optimum results. Even flocks with good uniformity will have a bell curve of bird weights outside the optimum range of the cutting equipment.

The equipment will probably meet minimum requirements but with more rework and downgrades and less yield than with a sizing programme. This makes a good sizing programme an ideal choice as part of the whole integrated process. In large plants with multiple high speed systems the sizing will quickly pay for itself.

When choosing sizing systems most plants with two or more cut-up machines – cutting front halves or breast caps to debone – will use a sizer that will self-calibrate and send smaller birds to one cut-up line and large birds to the other.

If the plant has three cut-up lines they may send overflow or under or oversized birds to the third line, which is not ideal because the cut-up line speeds will not slow down for odd sizes. For this reason, a manual line or 'flex line' is often used as the overflow line.

The best systems I have seen have

multiple cut-up machines and the birds are sized by actual gram weight to each machine instead of small and large.

This method not only provides a better performance at the cut-up machine, but when matched with debone equipment provides a more consistent sized front of cap resulting in a better debone performance.

To be most effective the plants will have a small volume hand cut-up line to process any birds that are too big or too small, or have parts missing or other size distorting damage.

Summary

In summary, while not the answer for every operation, integrated technology has many advantages over manual operations. The technology is the only feasible answer to some of the new market demands for easy meal solutions, smaller portions, and packaging and process that promote fresh product with longer shelf life and food safety.

Technology will always save labour cost through reduced handling. Technology integration is always the best method to maximise floor space and streamline a process. It is also a key component in eliminating the bottlenecks, and it gives the management team the ability to control the process flow. ■