

Fixed weight and count bring Knife edge decisions

SUPPLIERS OF SLICING AND DICING EQUIPMENT ARE MEETING USERS' NEEDS TO LIMIT GIVEAWAY ON HIGH-VALUE FIXED WEIGHT AND FIXED SLICE-COUNT PACKS, AVOID PRE-FREEZING OR CHILLING OF MEAT AND ENSURE OPTIMUM IN-PACK PRESENTATION.

One of the challenges, and the charms, of many of the best meat and cheese products is the variation in size, shape or consistency. As with any good void-filled Dutch or Swiss cheese, the consumer is likely to see this as part of the product's specific character. The more irregular the profile, the less processed – or more authentic – it appears.

From the processor's point of view, this has meant that historically it has been extremely difficult to combine fixed weight with a fixed slice-count on this type of product. Automation has never sat easily with minimising giveaway and, at the same time, safeguarding quality.

Of course, when handling cheaper types of meats with, for instance, a uniform round or square profile, checkweigher feedback systems can perform this task fairly accurately. But as Tony Ambrose, sales and marketing director at AEW Delford Systems, puts it: "It's bit like driving a car looking in the rear-view mirror. It's fine if you're on a straight road."

The first "sharp intake of breath" in the industry came in the late 1980s and early 1990s, says Mr Ambrose, when retailers started to ask for fixed weight and fixed slice count for bacon.

More recently, there has been a more general move away from water-filled commodity processed meats. Over the past two and a half years, this has fuelled growth in premium own-label ranges such as Tesco Finest, presenting many more suppliers with a similar problem.

Clearly, with higher value products, the need to limit giveaway on fixed weight packs becomes more pressing. It would be easy, says Mr Ambrose, to consistently add an extra 10g to a 140g pack. But the latest systems are said to cut this giveaway to around 1g.

This saving has been achieved thanks to a new generation of vision and laser systems. According to AEW Delford, its PolySlicer Vision uses these technologies to scan the con-

tours and consistency of any meat or cheese product at the cutting face. Says Mr Ambrose: "For each new slice, it measures the surface area, any voids, ratios of fat to lean meat, and will make an adjustment of the slice thickness to suit."

The company says this means high on-weights, low giveaway, consistently accurate grading and high output, all with minimal operator intervention. The system, introduced last year, has already seen installations in the UK, the Netherlands, Sweden, Poland and Korea. Depending on the value of the product, payback is said to be within around two years.

This latest slicing system from Delford is available with either gripper or continuous feed. As with any product which is potentially fragile and needs to be attractively arranged, the compromise between precision and speed is a key one. Delford's solution after the slicing stage involves a switch from a two-speed conveyor to a three-speed conveyor.

Shingling conveyor

As they are shingled, the slices move at a slow speed on the first "jump" conveyor. As each collation is completed, the conveyor automatically ramps up from slow to high speed. As the line starts to slow again, transfer to a second conveyor occurs at an intermediate speed.

The match in conveyor speeds has to be exact, says Tony Ambrose, as any mismatch will mean that the shingling pattern is either closed up or stretched. While the first conveyor continues to slow to the point where newly-sliced product is placed on the line, the second maintains the intermediate speed to allow each pack weight to be checked.

Before the robot tray-loading stage, any product which is off-weight or rejected for quality reasons is diverted to another conveyor, which the robot picking head ignores.

The Intelligent Portion Loading (IPL) Robot



Tray loading: Delford Intelligent Portion Loading (IPL) Robot can have up to six picking heads

can be used with the PolySlicer or any other portioning machine or slicer. One unit can be equipped with up to six picking heads while a front-end vision system can be used to monitor product faults such as burnt portions, oversize items and orientation. Its C-frame design will sit over various tray-sealing and thermoforming lines, and can be moved from line to line to meet changing production demands.

In the case of the IPL, Delford has patents on the gripper system. "We concentrate on products, especially in the protein industries, which you can't pick up with a vacuum," says Mr Ambrose. The robot is around two years old, but after a slow start, Delford says it has sold 15 in the past year in Europe and the Far East. Applications have included bacon, fresh meat and fish. In Poland, one installation is handling sliced cheese.

For the past four years or so, the same sophistication found on the PolySlicer Vision has been available in AEW Delford's Smart-Slice Vision Plus. But this system is used for automatic, intelligent portioning of fresh boneless meat.

Tony Ambrose explains: "It builds up a 3D picture of the bulk piece of product. The machine then decides, just as a butcher would



Vision and laser measurement: PolySlicer Vision from Delford adjusts slice thickness to product area



Cut and place: Pizzamatic machine supplied by JBS slices and places product such as pepperoni

decide, the best way of portioning it for different cuts. It will prioritise on the basis of what particular customers will offer for certain cuts, and on the highest returns available."

Meanwhile, Urschel has launched the Model M6 machine which incorporates the company's established dicing, strip-cutting and shredding technology, but now has hinged panels to allow easier access for cleaning and maintenance. "It is about hygiene and keeping the guarding off the floor," says technical director Paul Bruce. "People don't like having to lift the sides of the machine off, and the manual handling regulations are against it."

In addition, says Urschel, the electrics

including the variable frequency drive are now considerably more compact, and are fitted under the main body of the machine for easy maintenance.

Drive and feed rolls

For shredding, the M6 grips a slab of product between a drive roll and feed roll. Depending on the effect required, it is then shredded either by blunt cross-cut knives or shredding discs. In dicing mode, the machine grips the meat in the same way, but then uses a combination of circular knives and cross-cut knives to create first strips and then cubes. Unlike many competitor machines, says Urschel, the M6 can handle tempered product, with no need for pre-freezing.

Recent customers include Sun Valley which has seen an upturn in its poultry business. The machine is being used to cut chicken into strips for use by fast-food chains.

For dedicated dicing, Urschel's US parent company has the DiversaCut range, with models suitable for meat products and vegetables. In the two years since its launch, says Mr Bruce, the machine's popularity has grown. He explains: "Where it wins over our earlier Model G machine and competitor systems is that you can go down to 3mm cubes or up to 20mm. No other single machine can do that."

For cutting hard salami, sausages and pre-formed roasts, the DiversaCut uses a combination of a slicing knife to cut sections of product, circular knives to produce strips and then a cross-cut knife to dice. The machine can also be used to generate flat and crinkle-cut strips of

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meat. Like the M6, the DiversaCut range has hinged panels for trouble-free access.

According to Urschel, not all applications fit neatly into established meat and vegetable categories. For more diverse shredding and milling applications, its equipment is now in demand for manufacturers of everything from Indian spices to fruit smoothies, says Mr Bruce.

Other recent launches in the slicing area include the A500-W from Bizerba. First seen in the UK at last year's Foodex Meatex, the automatic system offers built-in checkweigher feedback for dynamic portioning. Immediately after being cut, each slice is weighed to ensure it is inside the preset weight tolerance. Slice thickness is automatically adjusted, if necessary.

The machine, which is built to IP65 standards, is operated from a touchscreen which can be used to access the various slicing programmes. Output is up to 250 slices a minute and product can be either shingled or stacked.

No freezing required

The precision of the system means there is no need to pre-freeze fresh product, says Bizerba, and so slicing can be carried out anywhere in the -4 to +7deg C temperature range. Importantly, the blade can be sharpened when still inside the machine, reducing downtime and the risks associated with handling a sharp blade. A simple control activates the automatic blade-sharpening programme.

The Food Machinery Company supplies cutting and dicing equipment from Feuma, Germany, suitable for vegetables or meat products such as bacon with the AE10 model, for example capable of hourly volumes between 500 and 750kg. The smaller AE6 handles volumes of 100-200kg an hour.

As such, the AE6 benchtop system is more appropriate for applications such as banqueting and hotels. However, it is used in development kitchens and in smaller-scale production. According to sales manager Lee Gapper, at least two food companies in the UK have installed the AE6 in this type of application in the 18 months since it was launched. One of these companies has also placed an order for the AE10. In this case, the machine will be shredding lettuce.

Change parts on the smaller of the two machines allow the drive unit to be set up for slicing and dicing operations, but also strip cutting, grating, mincing and even steak tenderising. Slice thickness on the Feuma machines can be adjusted between 0 and 8mm.



Hand-cut by machine: Output from the GMC Cube King dicing machine supplied by Selo UK

Where the slicing operation is part of a more complex food process, two vital considerations are the consistent quality of the cut and placing accuracy of each slice. JBS Process Engineering now supplies equipment which addresses each of these issues for in-line applications such as pizza or open sandwiches.

JBS markets linear and rotary slicer/applifiers from the US Pizzamatic Corporation. Unlike other systems which use disposable band blades, says JBS, these machines have hardened rotary blades that can be sharpened for continual use. If this is done, the edge will remain sharp enough to cut even frozen meats and cheeses.

This ability to maintain optimum sharpness means that the system gives above average weight-per-slice precision and "surgical-like" cuts without serrations.

Locate and place product

Rotary and linear models are available. The rotary RSA-125 can locate and place product on up to 125 random-spaced targets a minute on a single lane. This degree of accuracy in placing slices is due to the use of servo controls on the turret, says JBS.

The cantilevered LS2000 linear machine can be independently mounted above an existing conveyor and will top 12in pizzas with sliced product at speeds up to 45 a minute, says the company.

Slicer-applifiers used extensively on pizza and sandwich lines are also supplied by Selo UK, manufactured by the Dutch parent company. According to Selo, the machine incorporates a method of blade lubrication which ensures a clean cut, even with difficult materials. The chute geometry is designed for easy loading, minimising damage to fragile products, points out the company.

For dicing, Selo UK supplies equipment from the US General Machinery Corporation (GMC). Sales manager Malcolm Griffiths explains: "As consumers have become more aware of food quality, and more discerning in what they buy, there has been a change in the specification of diced meat from supermarket buyers." In the past, he says, 'machine-diced' often meant that meat was chilled down, then compressed and forced through blades.

"However, producers and retailers now want an accurate, well-defined dice, indistinguishable from hand-cut product, with the minimum of labour," says Mr Griffiths. He claims that GMC's Cube King and Rotary fresh meat dicers are among the very few automatic dicers that can meet these requirements. They are suitable for red meat, poultry and even fish.

Mr Griffiths continues: "The great advantage of these machines is that they do not put the product under physical pressure. There is no distortion of the product or blood loss, so that the final result is a well-defined dice that has retained its moisture, colour and bloom to give maximum yield and shelf life."

The GMC equipment allows product to be sliced at ambient temperature, with no need for chilling or case-hardening. According to Selo, many retail specifications now call for dicing either by hand or by a GMC machine. ■

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For full details of all PPMA members able to supply slicing and dicing machinery, consult the PPMA machinery finder service, tel: 020 8773 8111, or visit www.ppma.co.uk