

# READY MEALS REPORT

THE PHENOMENAL GROWTH IN READY MEALS DURING THE 1990S AND EARLY YEARS OF THIS CENTURY WOULD BE A DIFFICULT ACT TO MAINTAIN. THE MARKET ALMOST DOUBLED IN SIZE BETWEEN 1999 AND 2004, ACCORDING TO MINTEL INTERNATIONAL, TO REACH A SIZE OF AROUND £1.58 BILLION. MID-1990S ANNUAL GROWTH RATES OF UP TO 20 PER CENT HAVE NOW ADJUSTED TO MORE REALISTIC LEVELS OF AROUND 10 PER CENT BUT THE MARKET CONTINUES TO THRIVE.

## PREPARATION AND COOKING

### Autoclaving steps in to give longer shelf life

As retailers seek to maximise shelf-life, while maintaining the appeal of 'fresh' meals in the chill cabinet, suppliers have been looking harder at short in-pack thermal processes such as autoclaving. According to Holmach managing director Chris Holland, this can give products a shelf-life of 21 days plus, allowing them to stay on the supermarket shelves for an all-important two weekends.

In the past 18 months Holmach has supplied over 30 Lagarde autoclaves for this type of application. Now, says Mr Holland, the company's customers supply two of the largest UK retailers and three smaller or budget chains.

This change has happened only in the last few years, according to Chris Holland. "If you go back eight or nine years, this equipment was going mostly to manufacturers supplying overseas retailers," he recalls. "Retailers in the UK have tended to be quite resistant. The perception was that this was a canning process, and not suitable for 'fresh' foods."

But now, processors such as Riverside Foods (part of Northern Foods), Geest, Pro-Pak Foods and S&A Foods have installed systems for cooking either tray-packed meals such as Lasagne, Chicken Tikka Masala and lamb shanks, or components such as rice, couscous, vegetables and proteins.

In this type of equipment, the optimum cooking time for the majority of products is said to be just 10 minutes at 90deg C. In some cases, explains Holmach, fully-automated systems have been installed, allowing line speeds of over 120 trays a minute. This includes a cooling

cycle, taking the temperature down to below 5deg C, and so avoiding blast-chilling. Capacity varies between just 100kg and 4 tonnes a batch while full process control and traceability is provided by an on-board PC panel.

Typically, cpet trays with an appropriate heat-resistant top film are used. While this can add 20 per cent to the cost of the top film, for example, the overall on-cost for a sealed plastics tray capable of withstanding the heat process is small when weighed against the benefits, Mr Holland argues. The stand-up pouch is another pack format which lends itself to this type of process.

Holmach also supplies tunnels for continuous cooking, suitable for products such as vacuum-

when you have a significant vegetable component in the pack. For vegetables, breathable films are a better option."

For cooking the components of a meal, especially pasta, D2 Food Systems supplies the Vortex 2 system. According to the company, the cooker has the advantage of offering high daily output on a range of foods while occupying a small floor area.

In January of this year alone, says D2, two Vortex 2 systems were sold to ready meals manufacturers. "What is driving this is the fact that it is the only system that will guarantee no clumping on pasta," says managing director Dave Edwards. "At the same time, it is extremely hygienic."

As well as pasta, says Mr Edwards, the same Vortex 2 cooking system will produce good results with rice, potatoes and vegetables. The 'quench' stage in the cook-quench-chill sequence uses water to take the temperature of the product down from 95 to 20deg C, he explains, but also pulls out a lot of unwanted starch. The 'chill' stage then takes the final product temperature down to less than 5deg C. In addition, the Vortex 2 offers fast changeover

between one product and the next, says D2.

For blending rather than heat processing, Syspal has the Euro-bin Tumbler, which uses a 200-litre bin to mix ingredients. The machine now has a vacuum seal, so that even wet mixes can be handled.

Since it uses no paddles or blades, the Tumbler is said to reduce significantly the possibility of product damage when handling delicate ingredients such as pasta. Even the most



**Autoclaving:** Pro-Pak Foods is using three new Lagarde autoclaves from Holmach for ready meals production

packed meals. But when it comes to the other major alternative to autoclaving, modified atmosphere (MAP), Chris Holland claims that the technology is a relatively inefficient way of extending shelf-life in ready meals.

As he puts it: "If the product is a component meal, MAP isn't likely to work very well, since the atmosphere is progressively destroyed by the natural deterioration of the different products. And MAP doesn't add very much to shelf life

complex mix only requires two minutes in the Tumbler, according to Syspal.

It is ideal for short production runs, adds the company, and will often avoid the need for transfer from one container to another. As well as time, product wastage can also be reduced this way, and washdown completed in minutes.

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### DEPOSITING AND FILLING

## Turnkey lines maintain short run capabilities

**R**eady meals has become one of those established, well-defined sectors where specialist machinery companies can position themselves as project managers and turnkey suppliers.

While those supplying downstream packaging equipment may compete for this role, filling and depositing equipment manufacturer Turbo Systems says it is increasingly being asked to co-ordinate much wider installations.

"We are the product specialist, and depositing is where the customer is either going to make money or lose it," explains managing director Andy Lang. "We are finding that manufacturers are asking us to take control right through the process."

In the past, a customer might source a depositor from Turbo Systems, and a mixer and tray-sealer from two other suppliers, says Mr Lang. "Now they're getting it all through us, so we're ultimately responsible for each part of the process."

Many process and packaging lines for food and drink leapt towards much higher output requirements in the 1990s. But according to Mr Lang, ready meals maintained a requirement for short-run capabilities, despite a steep rise in consumer demand.

Line flexibility is doubly important because of the typically short product lifecycle. "You can see a nine-to-twelve month 'shelf-life' on any one

product," he says. Brands, retailers and consumers are always looking for new recipes and new presentations.

While changeover on the depositing itself is relatively simple, involving straightforward nozzle changes, tray variations can pose more of a challenge, according to Turbo Systems. "We use stainless steel or nylon pallets, which carry the tray or container along the line," says Mr Lang. "We design our own pallets so that each can carry one of two or three different types of tray. This can help limit downtime for product changeover."

In any case, says Turbo Systems, a busy ready meals operation is going to need several sets of pallets, each of 80 to 100 units. Each set, plus new tooling, can cost up to £10,000 and so it is hardly surprising that food manufacturers and their suppliers try to maximise the versatility of these carrier systems.

Ultimately, demonstrating the versatility of a line can make the difference between winning a contract and losing it. Mr Lang explains that one customer has just been shown how the flexibility of a projected line will allow two additional products to run. This now means the company can operate for 18 hours a day, so the project is much more likely to be approved.

Speed and effectiveness of cleardown are equally important when changeovers play such a vital role on the line. Turbo Systems describes three types of ready meals operation: a standard filling unit, an easy-clean depositor, and a full clean-in-place (CIP) system.

According to Mr Lang, many companies believe they need CIP. But this can take 40 minutes for a full cycle which, if carried out at each changeover, would dramatically cut uptime.

"In fact, what people want is a quick flush between products," he says. "We are working on the easy-clean type of system. This takes literally minutes to rinse out all sensitive areas, including the pallets. Then at the end of the shift, you can strip the line down for full cleaning."

As Mr Lang says, one of the company's areas of expertise is in minimising wastage of high-cost product. "CIP systems tend to involve a lot more pipework, and all the product in that pipework is wasted when the cleaning cycle starts up," he argues. "Some companies have tried going down the CIP route in the past and then backed off because of wastage."

For a protein-based meal, Mr Lang points out, throwing away 5 or 10 per cent of product during cleaning can make a huge difference to the profitability of the business.

Efficiency and flexibility are not the only concerns driving investment in ready meals. Companies also have to keep a careful watch on health and safety issues, as many operations move from purely manual processes to semi-automated and automated alternatives.

Ready meals supplier RHM Frozen Foods is hardly a small player in the industry. But transfer of product from holding containers to depositor hoppers has up to recently been a manual operation at the company's Doncaster site, with the containers sometimes being lifted up steps to the hopper.

Now, Turbo Systems has provided RHM with VP100 transfer pumps which were developed from an existing depositor range for pumping liquids. "The system is easy to use, and has taken away the need for manual handling," says Ian Bewick, engineering manager at RHM's Doncaster site.

### Weighing the options

At the depositing and filling stage, manufacturers are most likely to consider automation when planning to increase line speeds.

For example, weighing and handling specialist Euroweigh explains how ready meals company FoodPro Manufacturing wanted to increase output by at least 50 per cent but needed to find a way round the manual weighing used for the roast potatoes included in its products.

Any automation would be subject to space constraints and, points out Euroweigh, to the problems associated with fine weight-control of

## Topping the pizza

**P**izzas remain one of the high-growth sub-categories within ready meals. As producers have diversified their ranges with more adventurous toppings, pre-processed rather than fresh ingredients have become more important.

For example, Turbo Systems has helped Anaka Foods of Bradford to manage volume growth of up to 200 per cent a year in its operation making frozen pizzas with Indian-style toppings. Now Anaka makes 25,000 pizzas a week, incorporating recipes such as Chicken Tikka Masala, spicy kebab and spicy vegetables. Up to seven different varieties of 9in diameter pizza are produced.

Anaka uses an indexing conveyor and D150 depositor. The cantilever-designed conveyor has a quick-release mechanism for fast removal and cleaning and the air manifold pipework



**Multi-head filling:** Handling sauce with a Turbo Systems depositor

large-piece vegetables, especially at higher line speeds. Missed loads could mean lost end product, and a pattern of overweight portions would hit the customer's bottom line.

But FoodPro decided that Euroweigh's compact Speedweigh 311 linear weigher met its space, speed, accuracy and price requirements, and has ordered a four-head system.

Says FoodPro general manager Matt Brindley: "The product weighing procedure is highly efficient, and with the overall savings in production and manpower, we anticipate it will be self-financed within 12 months." Euroweigh is confident that the 311 can not only accommodate

the 50 per cent increase in output, but potentially sustain even higher line speeds.

The 311 operates at speeds of 60-80 weighings a minute, depending on product. This can include fruit or vegetable pieces, and most wet, dry or frozen solid pieces up to 30mm across, in a weight range of 10-500g. As well as roast potatoes, the FoodPro system is also suitable for free-flowing vegetables such as baby carrots, peas and sweet corn, says Euroweigh.

Each of the 311's four heads has an independent front and rear vibratory feed tray. Product is loaded via a gravity feed hopper mounted above the rear tray. As product feeds forward, a



**Placing pizza topping:** Turbo systems has supplied Anaka Foods with this D150 depositor

allows quick and simple connections to the air supply.

The D150 doses grated cheese or sauce accurately and consistently in pre-programmed volumes. It can handle liquids, semi-solids and par-

ticulates, and can be tailored for particular products. It uses lubricant-free pneumatics or electro-pneumatics.

Oiling of pans, platens and product is another aspect of pizza production which lends itself to automation. Saturn Spraying Systems has supplied names such as Ross Youngs, Green Isle, Kiren, McCains and Express Products.

Applications include precision oiling of pizza platens, spraying dough balls with oil, spraying a release agent into pizza pans and spraying oil onto cut pizza bases. There has even been an installation spraying an inch-wide ring of garlic-flavoured olive oil around the rim of a rising-crust pizza base, says Saturn.

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level sensor controls the contents of the front tray. The contents of the weighpan are then policed by a set of bulk and fine shut-off gates.

The F1 microprocessor control can operate with either average or minimum-weight settings. As well as target weights, this control system monitors functions such as vibration levels, bulk and fine gate closing.

Meanwhile, Easiweigh has installed one of its Quartet linear weighers to handle fresh and frozen vegetables for a food manufacturer seeking to reduce the number of operators on a ready meal line, while maintaining line speeds of up to 54 trays a minute.

### Four trays at a time

The Quartet weigher allows four trays to be filled at a time from as many weigh heads while the Pulse control unit maintains product weight parameters and is said to have cut giveaway in comparison with the previous manual loss-in-weight system.

Product appearance was another problem when the trays were manually filled, according to Easiweigh, but the Quartet's rise-and-fall unit on the outlet chute has led to improvements here, too. A tray-in-position sensor ensures that if no tray is available, no product is deposited.

The customer expects to see payback on the new line within a year.

Installations of Ishida's Retail Ready Line (RRL) since its launch at Interpack last year have included manufacturer Frenzel, now said to be the third largest producer in the German frozen food market. As also with many chilled ready meal lines, the emphasis is not on high output. The value-added product, in trays which allow steam-cooking in the microwave, are filled and sealed at speeds of around 45 a minute, says Ishida, although future increases in output would be possible.

Frenzel's RRL spans tray denesting, weighing, filling, checkweighing, tray sealing, metal detection, board sleeving and case-packing. It produces six different varieties of meat and vegetable-based frozen ready meals and format changeovers take under 10 minutes, says Ishida.

Product combinations are currently filled into 300g and 450g trays, although the line's inherent flexibility means that new tray formats and product types can be accommodated.

Operating at -8deg C, the filling station starts with elevators conveying four different types of product to a 24-head multihead weigher. The closest target weight from the various hoppers is discharged into each tray. A second 10-head



**Feeding two lines:** Adams Pork Products is using an 18-head Bilwinco combination weigher

multihead adds sauces consisting of small balls of butter, bringing the total number of food components to five.

Fresh sauces can be added via separate dispensers and checkweighing takes place before the trays are sealed, so that over and under-weight meals can be detected without wasting packaging materials.

Adams Pork Products (Geo Adams) is now also using a multihead weigher and has an 18-head Bilwinco BW118W machine, supplied by UK agent Ancholme Machinery, working on two adjacent lines loading meat-coated egg products into trays. The weigher is programmed to function as two independent nine-head systems to serve the two lines.

Product reaches the vibratory feeder to the multihead either from an overhead infeed or from an elevating flighted-belt conveyor suitable for loading from tote bins at ground level. Bilwinco also supplied the orientation tooling and tray indexing conveyors on the filling line.

US manufacturer Multi-Fill, represented in the UK by F Jahn and Co, has developed a product distribution system that allows its MPF SC120-01 automatic solids depositor to work with multi-lane machines, such as thermoformers or tray filling/sealing lines.

The system, aimed particularly at ready meals, is designed to handle hard to fill products such as cooked rice and pasta, vegetables, fruits and refrigerated salads at speeds up to 120 containers a minute. One MPF filling head can now deal with up to eight containers in various combinations or patterns. Alternatively, the distribution system can be used as a stand-alone unit working, for example, directly under a weigher.

Meanwhile, Grunwald UK reports that a

major UK supplier of chilled ready meals has installed a second line, after first installing one in 2004. The system this time uses a Multipond weigher for proteins, alongside various depositors and a Grunwald Flexodos volumetric filler for pasta products. The two-lane operation fills hinged-lid trays at speeds of 50 a minute.

Grunwald says its Flexliner line uses motorised adjustment for product changes, with only the pack magazine and pressing plates requiring change parts.

To complement its existing range of depositing machines for ready meals, Riggs Autopack has made further improvements to its Makeup Conveyor. The open, hygienic construction, using a single chain and pusher-pad container drive, now allows washdown with low-pressure hoses.

The conveyor incorporates stainless steel compressed air pipework with take-off points for individual depositor stations and signalling as required. They can also include electrical power sockets at regular intervals.

In addition, Riggs has developed a compact mobile transfer pump to transfer product from Euro-bins or tote-bins to the depositing machine hopper. The pumps are said to be suitable for both low and high-level hoppers and for hot or cold products, with or without particulates.

### High-volume, high-speed

While chilled ready meal lines are a key growth area within this sector, often requiring low-to-medium volumes and good flexibility, frozen ready meals remain an important sub-sector in their own right. As Raque Food Systems explains, output and run-lengths can be significantly higher for frozen ready meals, since longer shelf-life allows for greater flexibility in storage and distribution.

Raque has historically specialised in these high-volume lines, many of them for frozen ready meals. But as thermal process specialist Holmach points out, autoclaving has allowed manufacturers to explore other methods of

extending shelf-life. According to Raque, a combination of autoclaving and high-integrity sealing inside a high-barrier tray-and-lid combination can give ambient ready meals a shelf-life of three years.

Recently Raque installed a 240-tray-a-minute line, said to be the fastest of its type in the world, for a US supplier to the military. The same customer already has a 120-a-minute line.

The use of a continuous-motion system is essential in achieving this high line speed, explains Raque Food Systems Sales managing director John Rose. Dispensing comes courtesy of two 24-head Multipond multi-head weighers for proteins, rotary cup fillers for vegetables and several eight-head volumetric piston fillers for sauces. All of these transfers are carried out on the move, with the travelling carriages accurately tracking the trays as they are filled.

This US installation uses twin lanes. "To achieve the same output on an intermittent-motion line you would need six or eight lanes," says John Rose, "which would be very complex."

The continuous-motion tracking technique is also vital in ensuring that the filling is splash and drip-free. "Cleanliness of fill is of paramount importance," says Mr Rose. "You only need a pinhead of sauce in the filling area for the whole tray to blow apart in the autoclave."

**Denesting control**

Container denesting is one of those areas of technology where filling or packaging machinery companies offering turnkey installations often tend to defer to the specialists. If the line cannot be fed with a consistent and reliable flow of trays, then the quality of depositing and sealing is irrelevant.

One such specialist is FP Packaging Machinery which has recently upgraded its range of systems with servo controls, to offer speeds in the range of 60-80 cycles a minute per lane.

The first of two recent installations which demonstrate this new capability is at a ready meal supplier to the health sector. Here, two servo-driven twin-lane reciprocating foil tray placers manage speeds up to 54 trays a minute. The adjustable magazine will take tray lengths of 175-320mm while tool-free size change takes "just a few minutes", according to FP.

A second ready meal producer has taken a twin-head servo-driven system to feed a queuing conveyor fitted with a timing mechanism. In this case, denesting takes place at a rate of 60 cycles a minute and there is a handwheel-based size change that allows eleven tray sizes to be used.



*Multi-lane filling: Multi-Fill MPFSC120-01 automatic solids depositor from F Jahn and Co*

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TRAY SEALING

**Focus rests on hygiene, access and cleanability**

**W**hen it comes to tray-sealing, the focus is now on hygiene, cleanability and accessibility, says ready meals specialist D2 Food Systems.

D2 has been working with Spanish supplier Ulma to update and expand its range of Scorpius tray-sealers. Having previously represented Mondini, which has since established its own UK business, D2 is now the exclusive distributor of Ulma tray-sealers for Britain and Ireland and is launching a new range of four machines this March.

Completely new will be the lower output 400 and 600 machines. The 850 and 1100 tray-sealers were originally introduced around 18 months ago, but have since been redesigned, explains D2 managing director Dave Edwards.

"The demands of the UK ready meals market are far higher than they are overseas," says Mr Edwards. "It's a very competitive sector. There are far more chilled meals here than elsewhere, which means that fast-changeover, ease-of-access and hygiene are all more critical." Customers are also looking for scaled-down machines which achieve similar or higher output inside a smaller footprint, he adds.

Most tray sealers, at least in the higher speed ranges, use a system of pneumatically-locked dies for product changeover, explains Dave Edwards. Once the lock is disengaged, these simply slide out on to a trolley, and a second die is substituted. Film length and vacuum/gas levels are menu-driven from a PLC. On the Scorpius range, this means that a complete size change can be set up in 10 minutes or less.

Changeover time is important, says Mr Edwards, because a medium-to-large-sized producer might be packing between 500,000 to 600,000 meals a week, spanning 70 or 80 different meal types in 20 different trays. In this case, he extrapolates, the company may need to change the sealing line three, four or even five times a day. For high-value products, typical runs may last for just half an hour or so.

"But the real focus for us at the moment," says Dave Edwards, "is on cleanability and accessibility." Easy access is essential not only for effective cleaning, but also for maintenance. "All areas of the machine are easy to



**Tray sealing:** (top) TS250 machine from AEW Delford for low-to-medium speed production. (Above) High speed twin lane Raque tray sealer. (Left) Proseal AP60 machine will handle up to 160 trays a minute

Pivoting sealing heads make size change simple and convenient, says Raque, with the sealing platens requiring no pre-heating, and so saving on downtime. The cantilevered die-cutting head allows knives to be slid in and out, and the quick-release tray-carriers mean fast, tool-free product changes. The rate of lidding material consumption at high speeds makes the use of a second stand-by film mandrel invaluable, says the company.

Like other sealing equipment specialists, Raque has just three parameters to play with: time, temperature and pressure. "So, with our lines running at such high speeds, we generate much higher sealing pressures than anyone else

on the market," says Mr Rose. "And if you're exerting this huge downwards pressure, you need to provide an equal and opposite force, so the machines are extremely robust."

Raque points out that, unlike many other suppliers of sealing equipment, it

separates out the sealing and profile-cutting as two distinct stages, so simplifying the operation.

### Supplying smaller lines

At the low-to-medium speed end of the market, AEW Delford Systems has been marketing the TS250 tray-sealer for around a year now. According to sales director Dave Evans, the company has no plans to expand this range to include more than this one machine, which is equipped for modified atmosphere packaging. One-up, two-up and four-up versions are available.

When applying MAP, the TS250 is capable of running at speeds up to 15 cycles a minute and in a four-up configuration to give output of 60 packs a minute. Speeds are faster for non-MAP requirements. But as Mr Evans maintains, while high-speed lines are available from other suppliers, most lines for prepared foods such as ready meals do not require that type of output.

An integrated lane divider allows trays to be automatically loaded from a feed conveyor into the sealing carousel. Change parts can be swapped quickly and without the use of hand tools, says AEW Delford, while a touch screen gives simple operator access to settings. Changeover on the die set and tray tooling is said to take between 10 and 15 minutes.

Pin-centering ensures that each tray is positioned accurately for optimum film cut and sealing. The MAP chamber operating system offers

get to. There are no trap points or dead areas."

Mr Edwards continues: "Lines will often be handling very wet products. So at the end of a shift, you want to be able to use high-volume, low-pressure water to clean the machine down, with no possibility of the water puddling."

D2 claims that the indexing system on the Scorpius range is such that trays containing sauces or other liquids can be moved without spillage.

Tray-sealing speeds have been increasing, to the extent that the largest Ulma machine will seal up to 150 trays a minute, according to D2. Starting speeds in the Scorpius range are around 20 a minute. "As you progress to sealing multiple trays in each cycle, features such as high sealing pressures become very important," Dave Edwards points out. "Because of its long experience of thermoforming, Ulma has a very good mechanical lift mechanism."

One of the first Scorpius machines supplied through D2 has gone to CP Foods' new factory in Newmarket. The machine is being used to seal trays of frozen and chilled ready meals.

Says technical director at CP Foods Ian Hunt: "The machine's compact size is a major USP, as we have limited line space, and the hygienic stainless steel design with IP65 cleaning programme is particularly important for food production environments."

Some suppliers are paying particular attention to reducing materials wastage at the sealing stage. John Rose, managing director at Raque Food Systems Sales says: "We've come up with a process which can save between 30 and 60 per cent on lidding materials using our systems." Mr Rose will not go into specifics at this stage, but says the technique will be equally applicable to high-volume tray-sealing lines and smaller output installations.

Most of Raque's existing tray-sealing systems complement the high-volume frozen ready meal filling lines for which it is best-known. A multiple-component dispensing line recently installed at a supplier to the military in the US is matched with a platen heat-seal machine. In this case, the line is for extended shelf-life ambient meals, with speeds of up to 240 a minute.



**Easy access:** Waldner Interseal tray sealer now available from Selo-Bollans

similar precision, according to the company, with gas usage minimised for each pack.

According to Mr Evans, AEW Delford's move into tray-sealing came as a response to the market's migration to top-sealing, and the corresponding decline in loose film overwrapping of trays. Like so many retailer-driven trends in UK food and drink packaging, this change has been almost complete. And while the supplier's primary aim was to keep up

with developments in fresh meat and poultry, the same system can be used for composite ready meals. In both of these cases, gas flushing can be tailored to optimise shelf life and product appearance.

**Pack and seal quality**

Rather than speed, AEW Delford emphasises the importance of pack and seal quality. "If you're going to get the stated shelf-life, the gas needs to stay in there," says Mr Evans. "So the security of the pack seal is of vital importance. Our leakers rate is correspondingly very low."

Coping with similar line speeds to the AEW Delford machine, an F45 machine from heat-seal specialist Proseal has been installed at Geo Adams' factory in Spalding. The producer of savoury eggs, including Scotch eggs, supplies all



**Entry level:** Packaging Automation PA182 sealer at Bighams

the major retailers and needed an off-line packing facility for last-minute orders.

Proseal also launched a higher-output linear tray-sealer in the second half of 2005. The AP60 is designed to run in-line with filling and other line equipment at speeds up to 160 packs a minute. 'Free-flow' gas flushing can be used to extend shelf-life.

Abergavenny Fine Foods is packing its breaded cheese products using Ishida's QX775 tray sealer. Running at speeds of up to 50 trays a minute, the line handles products such as Breaded Camembert, Breaded Mozzarella Fingers and Salmon and Cream Cheese Bakes. The company needed to increase capacity, while having limited space available in the factory for new equipment.

There was an additional requirement for a

vacuum and gas-flush system, which came in the shape of Ishida's MAP-V process. Residual oxygen levels have to be very low, says process development manager Richard Bowman, adding that this system performs well by creating a vacuum and then quickly and accurately injecting nitrogen.

Abergavenny also valued the ability to control the speed of the infeed conveyor. The cheese products are manually loaded into the trays, and hand-packing speeds can vary considerably between products – or even between packing teams.

**Changeover in 10 minutes**

Tooling on both the Ishida tray-denester and tray-sealer can be changed in just 10 minutes. "With some tray-sealers the changeover can be as much as 45 minutes," says Mr Bowman, "and this is totally unacceptable."

Servo drives on the QX775 ensure that film speed, tension and cut-off lengths are consistent. Ishida says that its 'Inside Cut' technology stops lidding film from extending beyond the tray edge and also reduces film consumption by 5 per cent.

Other recent tray-sealing installations in the UK include a Vision 182 in-line machine from Packaging Automation, chosen by Riverside Bakery which supplies a range of stew and casserole ready meals in cpet trays to a major retailer. Among the heat-seal tooling options supplied by Packaging Automation is one set which provides an in-board trim for circular pots with 'ears' or handles. Since the film is cut before sealing in a separate process, says the company, there is no risk of damaging these projections.

For entry-level, rotary sealing, Packaging Automation says it continues to supply Bighams Global Gastronomy in London with its PA182 twin-station machines. These semi-automatic systems allow changeover in just two minutes, says the company.

Selo-Bollans is now representing German Waldner Group's Interseal range of tray-sealers which, it says, offer extremely fast, tool-free changeovers. The tooling trolley has its own pre-heating system, avoiding the need for a warm-up time on the machine after a size change while easy access to the tooling area and other parts of the sealer is key to the design, says Selo-Bollans. The line is compatible with RF sealing as well as vacuum and MAP systems.

A range of semi-automatic and fully-automatic tray-sealers from Vacuum Pump of Italy is being sold through Erapa (UK). The GV80 and GV90 machines will run, with two sets of tooling working in parallel, at up to eight cycles

a minute with vacuum/gas and 12 a minute without. PLC-controlled, the machines are built to IP65 standards and feature a soft-start/soft-stop facility to avoid spilling sauces or liquids. A pneumatic tray denester can also be supplied with the GV80.

In a new patented process, Erapa says the same machine range will seal hinged lidded trays with vacuum and MAP, and without the use of a top film.

Finally, Planet Flowline has supplied Heinz Frozen and Chilled Food at Okehampton, Devon, with a high speed twin lane Tecnovac Cronos tray sealing machine to handle a range of frozen desserts in 95mm diameter round trays. These are fed randomly from a spiral freezer in a single lane and then split into two lanes by a diverter belt before being spaced and entering the sealing machine as a 6 x 2 collation.

Other recent Tecnovac installations include an Athena machine for sealing round trays of sauce, which are subsequently sterilised in a retort, and a number of Ermetica M3 hand sealing units for products as diverse as jam into buckets and fresh prawns into trays.

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DECORATION

## First steps in automation for board sleeving

Like many other secondary packing and end-of-line operations in ready meals, say machinery suppliers, board sleeve application has often been left as a manual task, although automation is now being taken considerably more seriously

For example, AEW Delford's CT60 sleeve is designed as an entry-level system for those moving out of hand-sleeving. The machine can be employed in-line with the company's tray-sealer, running at a similar top speed of around 60 packs a minute and is also readily relocatable for use in different parts of a plant.

The company points out that the flat blanks used in this type of wraparound system are cheaper than the pre-glued alternative and also make a tighter sleeve possible.

Complex die-cut sleeves can be handled as well as those for round containers while sleeves can vary from full-width to 'watch-strap', where the quantity of board and size of the product information panel are minimised. The magazine hopper contains up to 600 sleeves.

According to AEW Delford sales director Dave Evans, the widespread introduction of the company's C-labeller for sealed trays was "one of the biggest changes that happened last year". The labels, which include panels on the top, side and base of the tray, are now widely used for catch-weight items such as fresh meat and poultry, but are also suitable for ready meals, he says.

The C-labeller has a number of potential

advantages, says AEW Delford, including significant material savings compared with board sleeves.

Application speeds can be up to 80 a minute, says Mr Evans – again comparing favourably with the CT60 wraparound sleeve. And the reduced information and branding area on the top of the pack can be turned to the retailer's advantage, he adds, as shelf space is increasingly optimised through vertical stacking, with key product information on the side panel of the label.

Another company offering a label-based alternative to sleeving is Erapa. The automatic BandAll system applies polypropylene or wet-strength paper labels in standard widths of 29, 48, 75 and 100mm. On-board printers can provide variable information coding.

### Entering the market

Like AEW Delford, D2 is targeting those entering the market from hand-sleeving. "As line speeds and labour costs have increased, so too has demand for automatic sleeving," explains managing director Dave Edwards. But this company claims that, in most cases, the move is to automatically-applied pregglued sleeves, since the most wraparound machines take up more space and are relatively expensive. In the case of D2, a short machine from Rama in Italy can efficiently replace two operators doing hand-sleeving, Mr Edwards argues.

For its part, Jacob White (Packaging) says it has a patented system on its latest board sleeving machine for holding the sleeve in position while the tray is inserted. Its semi-automatic SLX3 machine also features PLC control and digital indicators to assist size change.

But if entry-level replacements for manual sleeving represent a major opportunity for



**Higher speeds:** Cama OTT wraparound board sleeving machine can handle 100 trays a minute

machine suppliers, so too do higher-output lines. French machine manufacturer Paker, represented in the UK by Integrapak, has sleeving machines in output ranges from just 40 a minute up to 300. Fed with unglued blanks, these machines offer fast changeover – five minutes manually or just three minutes automatically.

Fitting into the medium-high output range, Cama of Italy has installed its OTT sleeving machine at a leading UK producer of ready meals. Again, using the wraparound principle, the system is capable of achieving speeds of 100 rectangular or round trays a minute. A ‘tuck-in lock’ ensures the sleeve does not slip off again once applied, says UK company Cama 3.

T Freemantle has preglued and wraparound sleeving options for ready meals applications. Its preglued sleeve is available in a semi-automatic version capable of handling 80 trays a minute, and an automatic version with an output up to 120 trays a minute. Over the last three years, says sales and marketing manager Richard Kitchen, the company has installed over 45 of these machines at customers including Northern Foods, Unilever and Young’s Bluecrest.

The same machine can run full sleeves, watchstraps, bands and twin-pack sleeves, says Freemantle, with in-line date/batch coding and size changeover time of around six minutes. The tooling set is designed to cope with intricate sleeve designs such as Unilever’s recently-launched steam-fresh product in a twin-pack.

When it comes to wraparound sleeving, Freemantle has supplied three of its updated machines to Northern Foods, applying watchstrap sleeves to round trays. The machine now includes a pack-squaring mechanism for consistent quality in pack appearance and gives speeds of over 100 trays a minute.

Kliklok-Woodman confirms the popularity of higher-speed sleeving for this sector. Eight of its



**Banding alternative:** *ATS machines use ultrasonic sealing*

Certiwrap C150 wraparound sleeving lines were ordered by ready meals customers in the second half of 2005, says the company. The 150-a-minute machine offers three-dimensional size change in just 10 minutes, and features a patented rotary feeder. Round and rectangular containers can be sleeved on the same machine.

A slower version, the C80, capable of sleeving 80 trays a minute, is also available and incorporates many of the features of the C150.

**Interest in cartoning**

Despite the growth in board sleeving for ready meals, Kliklok-Woodman reports continued interest in traditional cartoning within the industry. Its mid-range SFR stainless steel machine achieves speeds up to 150cpm and has been installed on a frozen ready meal line at the Findus Longbenton plant.

The Findus end-load cartoner accepts Meat & Potato Pie trays in 500g and 900g sizes, in this case at a rate of 120cpm. Gapping and timing on the infeed, which takes filled trays arriving at a random frequency, is of vital importance, says

Kliklok-Woodman. A high-speed version, the HSR, is also available, this time with speed capabilities of up to 300 packs a minute.

Another supplier of the Certiwrap range in the UK is Field Packaging Systems. According to project team manager Jeff Jones, the Kliklok range is particularly recommended where line flexibility is required.

But Field also supplies three types of wrap-around sleeves from Spanish company Pack Service. These are the low-speed semi-automatic Mini PS giving an output of just 20 trays a minute, the mid-range PS60 with speeds of 60 packs a minute using a reciprocating feeder, and the PS 120 which manages twice this output using a rotary feed. Field Packaging also manufactures tailored infeeds for the Pack Service range.

Banding is an alternative to sleeving that is popular on the Continent and is being pushed quite strongly in the UK. According to Swiss banding machine supplier ATS, represented in Britain by Jenton International, banding offers considerable cost savings as well as being harder to tamper with.

“Sleeves are woefully expensive in material and manpower,” claims Erich Lohner, general manager, sales and marketing, at ATS. “And because they are a relatively loose fit, it’s easy for unscrupulous shoppers to swap a cheap product for an expensive one.”

For volume producers, he adds, banding requires fewer operators per machine. “Banding machines are standalone or fully-automated devices that are simple to operate, whereas sleeve erecting machines are far more complex and cost many thousands of pounds more. The tighter fit of a band also stifles any intent to deceive by would-be miscreants in stores.”

Mr Lohner says ATS normally estimates the payback time on a banding machine to be “a

matter of months" and points out that banding material is "considerably less expensive" than sleeving.

"Ultrasonics can work continuously in the cold, humid conditions typical of a food factory, producing odourless seals that do not burn the banding film, leave deposits, or damage or taint the product," points out Mr Lohner. "In comparison, sleeves require gluing, which is an added production headache."

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### END-OF-LINE

## Compact machines aimed at smaller packing areas

There is no shortage of end-of-line equipment suppliers providing customers in the ready meals industry with the type of machinery that would be equally at home in any other type of food environment. But according to Dave Edwards, managing director at D2 Food Systems, compact size is becoming increasingly important in the final stages of the packaging process.

"The factories in this sector tend to have been recently built, with very small packing areas outside the sensitive production hall," he notes.

In fact, many of these end-of-line areas began life as manual operations with minimal space requirements. But as output has increased, large numbers of these specialist small to medium sized companies have seen the number of operators required increase to three or four over different shifts. Faced with these rising labour costs, many are considering automation.

"We developed a small, robot-based modular system. Historically, the equipment on the market has been very large and fairly expensive," says Mr Edwards.

### Plastic crates packed

As well as being more affordable, this new system from Italproject in Italy can include tray-sleeving, case-erecting, packing and palletising all within a 5 x 1.5 metre footprint. Plastic crates can also be packed and palletised on the same basic modules.

However, D2 does offer larger systems for those who need them. These Italproject

machines include the Robypack casepacker, the Eurowrap wraparound casepacker and the Minipal palletiser. It also has a range of pallet stretchwrappers from Technowrapp, a sister company to Italproject.

Like other food and drink products, ready meals are increasingly being demanded by UK retailers in shelf-ready packaging. Norwegian end-of-line specialist Nor-Reg, represented in the UK by Cornwell Products Machinery Sales, recently installed two high-speed tray-packing machines at a leading British manufacturer of chicken-based ready meals, such as Chicken Kiev.

Incoming trays are collated into a display format of between four and eight per outer, and top or end-loaded into the case. The format subsequently allows product to be loaded quickly, and directly, on to the retail shelf.

For flexible ready meal pouches Nor-Reg's method of pouch handling is said to allow the products to be packed into cases that are smaller and less expensive than traditional cases. Again, open cases or two part tray and lid cases are possible with the packs displayed in the cases either flat or standing for maximum on-shelf impact. ■

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