

Robots work alongside a conventional parlour:

Soft-play area for cows

Doubling cow numbers might be one route to ensuring financial success through scale, but it also necessitates some pretty meaty investment. One Dorset dairy farm has made the move to a multi-million pound robot milking set-up while at the same time helping to spread the cost by continuing to milk late-lactation cows through its old herringbone parlour

Nick Fone

With UK milk prices seemingly in a never-ending downward spiral, for many dairies it's a case of either get out now or throw yourself in deep. Some take the view that there's still room to tighten the belt and cut back costs even further, while others see expansion and economies of scale as their only option.

Dorset-based dairy farmer Max Frampton falls firmly in the latter camp. Over the past 18 months he has invested nearly £2million in a state of the art robot milking set-up, doubled cow numbers and taken on an extra 162ha (400 acres) of rented ground.

"We're 100% committed to dairying here, and to make money at the job I believe that you've got to aim big," he explains. "We've jumped in with both feet but it's a calculated risk. Our financial projections show us shaving 2.5 pence per litre off our costs with the investments we've made in the new set-up. Put simply, the bigger the volume of milk we produce the more we can dilute our fixed costs, but of course that's got to be accompanied by big efficiency gains."

Key drivers for the changes at Holly Farm were to increase the output of milk per cow and to reduce the reliance on staff. Having looked carefully at what had been done at other large scale dairies, Mr Frampton saw the obvious route to higher yields to be increasing the number of milkings each day to at least three. But of course doing that through a parlour immediately adds to the labour requirement by a third.

"Our biggest issue historically has been in finding and holding on to good quality staff. I knew we couldn't move to a three times a day milking regime through the parlour even though it's big enough, purely because



Having invested nearly £2million in a new shed and robot milkers at a time when the dairy sector is in the doldrums, Max Frampton has made the bold decision to double numbers and continue milking through the old parlour simultaneously – to maximize overall milk yields and spread his costs.



One of a brace of Massey 5480s fitted with loaders fills the mixer wagon. A JCB TM320-S pivot-steer has since taken over this role.



A Lely Juno feed pusher robot replaced a troublesome Joz Mooov for nuzzling fresh feed up to the barrier every two hours.



A Fendt 312 is reckoned to be the ideal match for the farm's 24m³ Shelbourne Reynolds twin-auger feeder wagon.



Mastitis milk is diverted automatically by the robots to a dump bucket.



Generic Motorman robot arms of the sort used in car factories are employed in the SAC set-up. Their robust build was one of the main factors in choosing them, explains Max Frampton.

we wouldn't be able to find the people to do it," he explains. "The obvious alternative was robots, so I started looking into the options available. The established names like Lely and Fullwood are well known in the UK, but there were some other options from the Continent that I hadn't heard of previously. Single-cow milking boxes are the most common but I liked the idea of having one robot serving a number of animals; it makes sense from an investment point of view."

With up to three cows milked in boxes arranged in line, GEA's Mlone system initially caught Mr Frampton's eye, but on closer inspection he was concerned that with ultra-high yielding animals the robot may not be

able to keep up. He then stumbled upon a video online of SAC's twin-box Futureline set-up.

"I immediately liked the look of the SAC system. With the robot positioned in between two milking boxes it seemed able to switch between them quickly and wasn't keeping animals waiting at any point even though it rarely has a breather. More importantly it's really robust. Rather than using purpose-made robots, SAC has opted for off-the-shelf Motorman arms – the sort that are used in car factories. They're built strong so can withstand kicks and are rated to lift 1.5t so they should easily handle clusters. A visit to a couple of set-ups in operation in Holland pretty much made up my mind."

With the milking side of things decided on, it was then time to choose what shape the shed would take. The design was a collaborative effort between Mr Frampton, SAC and consultant Ivor Davey from CowPlan, working with Irish cubicle specialist Wilson Agri.

"It was immediately clear that our existing sheds couldn't really be modified to accommodate a robot set-up and, if we were to expand the herd we'd need them to house the increased numbers of youngstock," says Mr Frampton. Consequently a big new building was seen as the only route, but then, of course, there was the issue of slurry storage to sort.

"Whatever we did, it became obvious it was going to cost a lot of money but we had to do it properly. After numerous trips to Holland and Germany, I could see the best route was to have an enclosed building incorporating the slurry store underneath. It would have been great to go out and order a brand new clear-span shed but the actual framework was one area where I could see we could make a saving. I managed to source second-hand 60ft (18.3m) trusses to place side-by-side in three spans to produce a building almost square in shape."

Having to go down into the slurry store, the steel uprights had to be brand new but Mr Frampton, working with concrete engineer Dave Parsons, had other plans to make sure the construction was planned as cost effectively and as strong as possible. Initially the site was dug out to 4.5m below final floor level, hardcore packed in and a huge 55m x 67m concrete base was poured in sections 23cm deep with water bars dividing them and ensuring there could be no leakage. Steel mesh was used across the whole site with reinforcing bars projecting out around the edges to tie in the mass-poured external walls. The stanchions then had 600mm ribbed plastic drain pipes zip-tied around them to act as formers for concrete to be poured in to encase them and protect them from the slurry. Across the base, upturned Milton ring storm drains were also back-filled with concrete to form support pillars for all the preformed slatted passageway sections and the flat concrete panels that bridged them to create the cubicle beds. This set-up resulted in a 4.0m deep void under the cow building providing enough room to house at least 14,000m³ of slurry. Taking this approach certainly made sense from a logistical point of view but Mr Frampton had some fairly major concerns about the impact of concrete slats on foot health.



The four robots are arranged in a line across one wall of the three-span shed. To either side are holding pens for cows split out at the shedding gates with separate cubicles, water and feed.



Each of the SAC Futureline robots serves two boxes. Cows enter from the cubicles at the rear (top of the picture) ...



... and exit via a passageway with a shedding gate.



Without feed passages splitting the housing area, yoke barriers form three sides of the building to provide enough feed space for over 400 cows.

"It's widely known that slats don't do a lot of favours for cows' feet, and we really didn't want to take a backwards step with lameness. It was on a trip to Belgium that I found the solution – cushioned rubber slat covers made by Irish Custom Extruders. Although I was focused on cow comfort it also solved another issue for us – scraping up. "Because the cambered rubber flexes each time a cow treads on it, muck travels off and down through the slat gaps, doing away with the need for scraping. I was cynical at first but it really does work; we haven't scraped the passageways in almost a year. In fact it's the higher traffic areas at the feed barrier and in front of the robots that stay the cleanest because they're flexing so much more often."



Control screen for the four robots is constantly monitored by staff to check how individual animals are performing and whether they're coming forward often enough for milking.

Farm facts

AW Frampton and Son, near Dorchester, Dorset

Farmed area

486ha (1,200 acres)

Cropping

Maize 200ha (500 acres), winter wheat 42ha (100 acres), rotational grass leys 244ha (600 acres)

Livestock

750 Holsteins (averaging 12,500l/yr): 400 milked through 4 x SAC double-box Futureline robots, and 350 through 24:24 Gasgoine Melotte herringbone parlour. Approximately 450 followers

Machinery

Massey Ferguson 7618, 5480 x 2 with loaders and 5608 on scraper; Fendt 312 on 24m³ Shelbourne mixer wagon and Fendt 308 LS on straw chopper. JCB TM320-S pivot-steer telehandler and Boreco cubicle bedder

Staff

Max Frampton plus eight others full-time

He admits that the cushioning does make it a more appealing place for cows to lie but that hasn't been a problem because the cubicles are so comfortable. Wilson's CowCoon frames with flexible plastic lower rails divide up the beds, but it's the mattresses that hold the secret. Sourced from Canada, the Promat Gelmats arrive on farm looking like deflated lilos filled with silicone powder. Once laid out, water is pumped in, turning the dust to gel. They're then connected up to a valve-controlled manifold that uses the dairy's compressors to maintain a constant air pressure in the beds.

"The whole set-up is just like a giant soft play area for cows. They know they can't hurt themselves, so they run around like loons. It's brilliant for spotting bullers; they

are so sure-footed that they can really display their natural heat indicators, making it easy for us to detect bulling cows and serve them in good time. Although they're virtually all heifers we've seen conception rates improve massively over the old dairy's." The impact on lameness cannot be overstated, believes Mr Frampton. Foot problems in the new building are almost a thing of the past and trimming is now a routine hoof care job rather than a remedial fire-fighting effort. It's clearly working as Holly Farm now regularly achieves the best locomotion scores in the entire Marks and Spencer producer pool.

Because of the way the robots are laid out along one edge of the building, it was decided that feed passages would be avoided and instead yoke barriers would surround the other three sides of the shed. This provides plenty of feed space and means one area can be sectioned off for a training and fresh-calver group. A 24m³ Shelbourne twin- auger feeder wagon mixes the ration and a pusher robot runs around the outside of the building every two hours ensuring the cows are never short of fresh feed.

Mr Frampton did his research on the various robots available for this task and, in keeping with the rest of the set-up, wasn't prepared to just accept the conventional products on offer. Unfortunately, however, this policy didn't pay off with the silage pusher. Initially it was a Moov robot made by Dutch firm Joz that he installed at the new unit. But it regularly lost its way when doing its rounds despite marker beacons positioned around the building. Its final departure came when it was found trundling off across the yard with smoke and flames pouring from its lid.



The existing Gasgoine Melotte 24:24 parlour was originally to be made redundant but it's now critical in maintaining milk yields. As cows begin to turn stale in the robots and voluntarily reduce their milkings to twice a day, they are moved over to the parlour and milked three times a day until they're really ready for drying off. This can see them giving an extra 3-4 litres/day.



Swinging tubular steel barriers act as one-way gates making training the cows to the robots a much easier task. Those that aren't going through as often as they should can be picked out, pushed through the barriers into a mini collecting yard and then travel on through the system at their own pace.

"The Joz was one of the cheaper options on offer at the time and it just wasn't up to the job. About five months in I was doing more pushing up than it was and I realised we needed to send it back. Since then we've had a Lely Juno installed. Though we've had to add some timber rails to the gates so its sensors know where it is, it hasn't put a foot



The 23cm deep concrete base for the underground slurry store was poured in square slabs with reinforcing bars protruding up to tie in the mass-poured concrete walls.

wrong. It's costing me £100 a week in finance to push up the silage every two hours. My Romanian staff tried to persuade me they could do it for that money but when I explained they would have to get up right through the night they weren't so keen. The cost is cheap – I think we're probably getting an extra litre a day out of the cows just

profi
THE FARM MACHINERY MAGAZINE

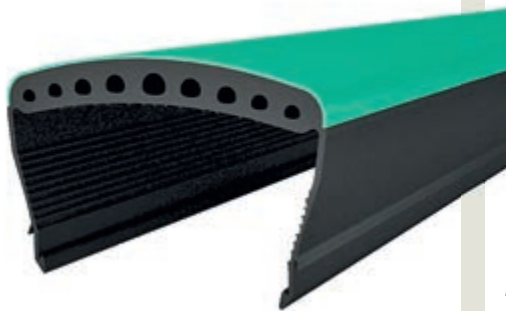
Practical test:
BvL V-Mix Plus diet feeder

Don't miss the February issue

Call now to subscribe
+44 (0)1795 592 896

because they've constantly got fresh, palatable grub in front of them. We certainly saw the drop-off when the old robot wasn't working."

And it's robot efficiency that is reckoned to be the other key driver for increased yields. When preparing for the move to the new set-up the 380 cows already running through the 24:24 herringbone parlour were



Cambered rubber slat covers flex as the cows walk over them, shedding muck down into the slurry store below and doing away with the need to scrape. The cushioning that these slat covers provide means lameness isn't an issue and the cows can exhibit their natural behaviour – a big bonus for spotting bullers.

moved over to three times a day milking. This saw outputs rise from an average of 9,700 litres/year to over 12,000 litres. With the average number of milkings standing at 3.2 per day in the robots, it's hoped that this trend will increase once the current batch of maiden heifers enter their second lactation; the target is to see them breaching the 13,000-litre/year barrier.



Keeping the heelstones clear with a rotating brush at the same time as applying limed paper bedding, the Boreco trike means it only takes 15 minutes to deal with all 400 cubicles.

"For our business model to work we have to chase maximum yields but not at any cost. By providing the best living conditions possible and then allowing the cows to milk themselves we're taking the pressure off them so we're hoping they'll last a good five to six calvings.

"Initially we had planned to take the parlour out of the equation altogether once the robots were up and running, but we've found it's a very useful tool in maintaining yields right through the lactation. We can't afford to lose the volume."

As cows begin to turn stale, they are pulled out of the new building and moved back to

the parlour where they can be pushed through twice or three times a day as necessary. At the moment those that are tailing off are picked out by hand and then pushed through one-way gates into the robots but this is felt to be limiting their efficiency. By utilising the parlour for late lactation cows, the robots can be worked to their maximum, ultimately dealing with over 430 animals while another 350 cows can be handled by the parlour.

Summary: Rather than opting for the familiar names Mr Frampton has opted for the less obvious robot alternatives to cut production costs and up yields. The system certainly seems to be working and, by running the cows at the latter end of their lactation through the parlour, is maximising output.

"With such a big investment our financial success all hangs on scale – that's the only way we can make the figures stack up. Before we started the project we were doing 2.8million litres a year, and now we're on course for 8million. About 3.5million of that is on an M&S contract for 34ppl, while the remainder sits at 22ppl with Dairy Crest. That pulls our average down to 28ppl.

"We've invested £1.8million but that has to have a positive impact on the bottom line: it's chopped our production costs by 2.5ppl so it means we've still got a viable business. For the future I think we'll still need to up numbers. The new shed has got room for 100 more cows, but to do that we'd need another robot. If that's what we do, I'd not hesitate in going for another twin-box SAC."

Get the most from your £!

LAMMA 16
THE UK'S LEADING FARM MACHINERY, EQUIPMENT & SERVICES SHOW
STAND G49

www.joskin.com

Drakkar & Transfer auger

Multi-purpose trailer payloads from 23 m³ to 60 m³
Auger capacity up to 450 t/h

JOSKIN

Call now +32 43 77 35 45 • ukinfo@joskin.com