



System takes the grind out of handling slurry containing sand

It'll all come out in the wash

Sand is the bedding material of choice on a growing number of UK dairy units. But slurry management issues are still a barrier for some herds. We visited a Norfolk-based unit with a cost effective and practical solution to slurry worries.

text **Rachael Porter**

A switch to sand-bedded cubicles three years ago proved to be just the thing to tackle one Norfolk-based herd's clinical mastitis problem, but it created another herd management headache – a huge annual sand bill and slurry handling woes.

Enter a sand recovery unit, which has successfully slashed the annual cost of buying sand to bed cubicles for Ken Proctor's 350-cow herd of pedigree Holsteins, while at the same time reducing wear-and-tear on his slurry handling system.

Ken's Airfield herd is based, as its name suggests, on a disused ex-US air base in Shipdham, near East Dereham, and is run with help from Ken's sons Robert and Ralph. And it was the brothers who pushed for sand beds. "Environmental mastitis was becoming progressively worse here, so we knew we had to do something to halt and reverse that trend," says Rob. "There are a lot of herds around here that use it to bed cubicles, with considerable success. It's an inert bedding material – bacteria can't grow in it."

He and Ralph dug out the existing cubicle beds in summer 2007, right down to their chalk base, with a mini digger and bought some sand from the

local quarry at Bittering, just three miles away. Each cubicle was then bedded with a layer of sand – about 175mm deep.

"And we haven't looked back since – mastitis incidence began to fall within just a few weeks," says Rob, adding that today levels stand at a respectable 39 cases per 100 cows per year. "It's certainly dealt with the high number of Strep uberis cases that we were seeing. Sand beds are not a panacea, but they're an important part of our herd's mastitis control plan."

Handling worries

Ken agrees that sand is certainly the best bedding material for the herd and the unit as a whole. "Straw was becoming expensive – it's still around £60/tonned delivered. And, ultimately, we were led by the cows – or rather udder health – so that was our initial focus when deciding to switch to sand. But we did worry about how we were going to handle the sandy slurry afterwards."

And it was a worry. That was until they installed a sand separation system, designed to relieve some of the burden of handling slurry from a sand-bedded system.

Sand clogs pipes, fills slurry storage

ponds and wears machinery used for both spreading and pumping liquid, according to Midland Slurry Systems' Peter Russell, who installed the sand 'washing' system at Grange Farm. So his Warwickshire-based company teamed up with the US-based McLanahan Corporation, which makes sand manure separation (SMS) machinery originally designed to wash impurities from sand and gravel during mining operations. "If the machinery can cope with that, it's certainly robust enough to cope with sand in slurry," says Peter.

The system works on the principle that sand is heavier than both organic material and liquid, and so it harnesses gravity to do the heavy work, rather than requiring extra power.

Ken says that his electricity bill has remained the same, even though the system runs for between six and eight hours each day. "The motors that power the system are all three-phase and run slowly, so it doesn't guzzle power – just slurry," he says.

The auger is continually fed at a slow rate, with sand-loaded slurry from the reception pit. A key factor in the process is moisture content, as the drier the consistency the more wear there is on key components. The separator can deal with 18,185 litres per hour and could easily handle slurry from a 1,000-cow herd, giving the family scope to expand the herd in the future.

Payback period

Payback for the £100,000 system is five years, just in terms of sand savings. "However, this doesn't take into account the knock-on benefits of installation, such as reduced soil compaction, reduced

'Rubberised' pump set to revolutionise sand-handling systems

They're by no means a new invention – the US mining industry has been using them for years. But now a rubber-lined pump, which is small yet powerful enough to work in a sand recovery unit, is available from Midland Slurry Systems. One has already been installed on a unit in Scotland and although the Lina-tex

'rubberised' pumps are more expensive than their metal counterparts – around £12,500 each compared to around £7,700 – they are expected to last for at least five years. The pump has a rubber coating on its bowl and its impeller, which will eventually wear away but it can be re-rubberised, according to the company's

Peter Russell. "Sand and moving parts are not a good combination if you want things to last. So this technology is a huge improvement on the traditional metal pump, which typically needs replacing or rebuilding every 12 months and certainly required a lot more greasing and servicing."



Recycled sand: Ken Proctor examines the recycled bedding, which he says is softer than new sand

time spent managing muck and a higher fertiliser value of the material left to spread," says Ken.

The system has now been in place for more than two years and there have been no serious problems or changes to the initial system.

"We're really pleased with it. We do have the occasional breakdown – where there's sand and pumps or machinery with moving parts that will always be the case. But, as a general rule, we spend less than an hour a week sorting out any issues with the system," says Rob.

The washed and separated sand is heaped up on the unit's concrete disused runway

and left to 'rest' for three months before being reused.

The system saves the Proctors thousands of pounds each year in sand costs. "We buy in just 20% of our annual requirement now – just 500 tonnes per year rather than 2,500 tonnes – a cost saving of around £26,000 each year," says Ken.

And he actually prefers the recycled sand as a bedding material. New sand has a relatively high clay content and can set hard on the beds. "But reclaimed sand contains no clay – it's washed out during the recycling process – and as a result it's softer," he says. |



Reliable system: the sand recovery unit requires very little day-to-day maintenance