

Titbits

Magnets attract positive results

The use of magnet technology to help keep dairy equipment clean (reported last issue) has been undergoing further trials.

At Bonlac's Shepparton plant, a new very high powered magnet has been tried on the feedline of a F100 atomiser running three products - full cream milk, butter milk and skim milk - during a 24-hour period at about 51% total solids concentration.

Wayne Stoll, the branch manager, said that with a 64mm rubber spacer installed, the magnet resulted in a 50% reduction in build-up in the atomiser. Without the spacer, a 60% reduction was achieved. In both cases the normal burn-on and brown soiling effect was missing.

There was a fleck deposit on the drier distributor wheel but it was still white and soft and the equipment was much easier and quicker to clean, he said.

The feed pipe into the atomiser was also clean, the normal crystallisation of mineral deposits did not occur.

Testing the potential

The next step, Mr Stoll said, would be to test the magnets' potential for keeping the powder particles from depositing on the side of the dryer chamber.

At Bonlac's Cororooke plant, branch manager, **Ron Storer**, said magnets on the evaporator had halved thermophile and anaerobic spore counts which had made it much easier to meet tough powder specifications.

At Bonlac in Cobden, **Garth Buttimore**, the plant's special projects manager, is using the magnets on a triplex scraped surface heat exchanger which pre-heats concentrate prior to atomisation.

He said that for the past two years, they had been struggling to keep the triplex units clean. There was a tendency for heavy deposits on the last stage of up to 60-125mm thick which meant substantial increases in CIP times and strengths.

The units usually undergo CIP every day and are opened and physically inspected and cleaned every three days.

One very high-powered magnet was installed about 1.8m from the feed-in on the first of the heating units. The units were left for a week with a reduced strength daily CIP.

When the units were opened and inspected they were very clean. "The barrel surfaces are shiny again, there are no signs of milk stain and only minimum protein

During that week, the heat exchanger units were putting through 10,000 litres an hour of skim, full cream and butter milk concentrate at 50% total solids.

The next test would be whether they could get extended runs without protein build up, Mr Buttimore said. This time of year they were only running for 16 hours a day compared to about 22 hours later in the season.

It was possible to clean scraped surface heat exchangers with chemicals, he said, but it required high chemical concentration of about 2 - 2.5%, temperatures of 75-80°C, and long times of 45-60 minutes. "What we would like to see is a half hour wash at 70°C and 1.5% concentration."

Mr Buttimore couldn't say yet whether this could be achieved with the magnets. "It's the wrong time of year to prove them but the technology is interesting."

Wayne Kelly, Bonlac's research and development co-ordinator, said there was not necessarily a common thread of benefit from the magnets between the plants - the benefits varied with the factory set-up.

The Nestle Tongala plant has also been using magnets. As well as the usual milk products, Nestle makes infant dietetic products which are fortified with protein, sucrose or lactose, Greg Bowers, the factory production superintendent said.

The company is using magnets placed on the inlet pipes to each stage of a four-effect evaporator. While the magnets have performed better on the straight milk products, such as full cream and skim milk powders, they have still performed well on the fortified products, particularly the protein-

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fortified products, he said.

The plant runs for about 18 hours on one product then switches to another for about 12 hours.

This continuous program includes 2½ hours between the two stages to clean the evaporator. The magnets have allowed this to be cut to 1½ hours because any build up is very soft.

The 12-hour stage usually processes a high protein product with various ingredients added and very little (about 10%) milk. After this stage, a four-hour caustic clean and acid rinse is required. The magnets have allowed this second clean to be cut by about an hour.

Mr Bowers believes that, eventually, the first stage clean could be avoided altogether. It would only require the usual equipment change. He said changes to the program seemed to work, but more tests would be needed.

The company will also be using magnets on a spray dryer which dries skim milk and full cream powders. Mr Bowers is confident that they will be able to replace the two 16 hour runs with one 26-27 hour run before cleaning is necessary. "We'd be gaining two to three hours which over 12 months is quite significant."

High sucrose products

Mr Bowers said the magnets were more suited to wholly milk-based or protein-modified products, but had still been a help on other modified products. The magnets also appeared to be of benefit when processing high sucrose products.

"We manufacture sweetened condensed milk on another evaporator. The sucrose content of that is about 42.5%. We will be trying that in September and the results should be interesting. From what we've done so far, I don't see why the magnets wouldn't help."

Mr Bowers said there was no doubt that the magnets worked on the factory's high lactose powders ranging from 18 to 28% wet mix with a few mixes up to 40%.

The major benefit to the Tongala plant, Mr Bowers said, was the gain in production time through reduced cleaning requirements. "Our plant runs at about 100% capacity with about 80% of production being exported. If we lose an hour we can never make it up. There will also be a saving in caustic and acid but the major benefit is time."