



Innovative dairy steps up during COVID-19 crisis

Rotterdam's floating dairy has come into its own – fewer than 12 months after milk production began – by providing city residents under COVID-19 restrictions with much-needed dairy produce. We spoke to the Dutch engineer and producer behind the business to find out more.

TEXT RACHAEL PORTER

The idea of producing food close to where it's actually bought and consumed has certainly come into its own during the past few weeks. And it's an idea that Dutch engineer and dairy entrepreneur Peter van Wingerden came up with after working in hurricane-torn New York, back in 2011, and that's keeping Rotterdam, another large major city, supplied with milk during the COVID-19 pandemic. Hurricane Sandy highlighted just how vulnerable New York – indeed any large city that's far from where food is produced – is when there's an event that means that the 'normal' infrastructure breaks down. The hurricane left

roads damaged and flooded and the 1,500 or so trucks that enter the city each day were unable to deliver food. "It got me thinking about what could help to reduce, or even remove, that vulnerability, particularly as more extreme weather events like flooding, storms and drought are becoming more frequent as a result of climate change," says Mr van Wingerden. "I hit on the idea of producing food – fresh, nutritious and healthy food – close to where it's actually required. And somewhere where it would be more immune to the consequences of climate change." So the idea of the 'floating' farm was born and the first

Design concept: a computer generated image of the first floating dairy in the world



COMPANY PROFILE

Company name	: Floating Dairy
Owner	: Peter van Wingerden
Location	: Rotterdam, The Netherlands
Herd size	: 40 cows
Average yield	: 8,000 litres
Processing	: milk, yoghurt and butter
Unit size	: three 900m² tiers



one has been built in Rotterdam where Mr van Wingerden lives and works. Designed to offer food security in the event of climatic change that could affect infrastructure, this floating dairy it now proving its worth during the COVID-19 pandemic. That said, the virus has hit the unit, in the sense that all the city's coffee shops and cafes and restaurants and school that took milk from the dairy have closed down. "In mid-March sales had dropped back to levels we saw during the first few months of production, with just a few local deliveries on a small round. So we had to think on our feet," says Mr van Wingerden.

Milk delivery

The small farm shop at the dairy, where customers could buy milk, butter, buttermilk and yoghurt direct has also been closed during the lockdown. "But Rotterdam's residents still wanted and needed dairy produce. So we decided to take it to them. "We expanded our small delivery round, literally overnight. We now deliver dairy produce six days a week, rather than just two. And, three weeks after lockdown began, our sales volumes are virtually back

where they were prior to the closure of all food service outlets," he explains.

Mr van Wingerden is also proud that what they're selling is fresh, healthy and nutritious. "With many now surviving on store-cupboard staples and frozen produce, dairy is an essential 'fresh' staple. And it's all produced here, on their doorstep. Fresh dairy produce no longer needs to travel a long distance to reach their table."

When the lockdown ends and people get back to their 'normal' shopping and eating-out routines and habits, he believes that some customers may continue with home delivery and the business will, without a doubt, have gained some additional loyal customers.

"But whether we'll be in a position to expand milk production to meet an increased demand remains to be seen. For now we're just happy that we still have an outlet for our milk and that the dairy is doing exactly what it was designed and developed to do. People in the city have a supply of fresh, local dairy produce, despite the lockdown."

Floating barge

He began working on the floating dairy concept in 2012, when he returned to Rotterdam, which is co-incidentally where he's based. The city is the largest port in Europe and is a delta area of The Netherlands – at the end of a river and next to the sea. The tide can rise and fall by as much as two metres, twice a day. The structure of the three-tiered floating barge, which houses the dairy, had to be stable in high rainfall and storm conditions, as well as tolerating the daily ebb and flow of the tide.

"We have designed a climate-adaptive building, which meets the strict clauses in the permit. It must be 100% stable in heavy rain, storms, high tides and strong winds." Also key was the floating structure's modular design. This lends itself to being stable, because it's all contained. But it also means that it can be extended



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*Grazing 'holiday':
 dry cows and
 heifers enjoy some
 fresh grass away
 from the floating
 dairy unit*

easily, simply by adding another module. Each tier has 900m² of floor space. The top tier or level is where the cows are housed, the second tier is where the processing dairy, as well as the small shop, are cited. The bottom tier is the floating section – it's what keeps the farm up and out of the water and stable. It also houses the waste management plant.

The 40-cow dual-purpose Dutch MRI herd – 34 are in milk at any one time – are milked through the floating farm's Lely AMS and they are fed 'cut and carry' grass from the city's football and other sports and amenity facilities, as well as other feed waste from the surrounding food factories and distilleries. "By products from the city are fed to the cows, who then turn it onto fresh, wholesome milk that feeds people in the city."

No waste

Waste from the dairy is also processed – slurry is separated with the solid fraction given back to the parks, gardens and other surrounding farms. And the University of Delft is developing a system that then takes the liquid fraction, which is 90% water, and separates out the salts (urinary waste). This salt fraction is reused as fertiliser and the clean water flows into the dock and out to sea.

"Everything is recycled and there is no waste," adds Mr van Wingerden. "It had to be fully sustainable for it to work. We have the technology to treat everything and have worked closely with Dutch universities to find innovative solutions."

He says that his complete cycle – this compactness – is another one of the system's strengths. "It's not about economies of scale – it's about finding a scale to suit a city. A larger city than Rotterdam, for example, may require three times as many cows – so three floating modules – to meet its dairy product requirements. And this should be balanced with by products or 'feed' coming from the city and the recycled waste that it can take back and reuse."

The cows' ration, which can contain anything from bread waste to football pitch grass, through to protein-rich distillers' grains and potato peelings, varies. "So we closely monitor and check that it's well balanced and we add vitamins and minerals are required."

Alongside this food supply, some grass silage is grown on a unit just outside the city where dry cows and young stock are kept. The TMR provides maintenance plus 20 litres and individuals cows are then topped up through the robots with a 8% protein concentrate.

"We're not pushing for high yields, so we don't feed a lot of concentrate," says Mr van Wingerden, adding that the herd average is around 8,000 litres per cow.

Food security

He says that even though he designed the dairy and it's been up and running for almost a year, he still looks at it every day in awe. "I'm amazed at what we've achieved and I'm also proud that it's come into its own for the city – and its people – so soon after we began milk production. "The idea was borne out of watching people struggle in a crisis. I like to think that this has helped to alleviate some of the pressure during the COVID-19 pandemic. COVID-19 has put one plan on hold. A floating egg and vegetable farm was scheduled to begin production, on a similar module next to the dairy, in late 2020. "But we still don't have a permit. With everything on lockdown, I'm not expecting that to come through on time now." Mr van Wingerden adds that other cities all over the world have shown an interest in the dairy. "We've had visitors from as far as Singapore, China, the Middle East and the US. I think COVID-19 will certainly focus minds on the issue of food security and provenance. It wasn't a climatic event this time, but the unit has shown that it can do what it was designed to do – to ensure that consumers have access to fresh, healthy produce when world events get in the way of 'normal' day-to-day life."