

**SPOTLIGHT ON...**

# Rotterdam

A concrete cow stands outside the entrance to the Floating Farm ahead of live animals being brought on board



## A Floating Future?

The world's first water-borne dairy farm has been erected on the shores of Rotterdam. What does this say about the future of food, cities and, indeed, cows?

Text and photography by Harriet Constable

**SPOTLIGHT ON...**  
**ROTTERDAM**



- **Geographic Location:** Western Europe
- **Long. Lat. Coordinates:** 51.912991° N, 4.413237° E
- **Land Area:** 208.80 km<sup>2</sup>
- **Elevation:** 0m
- **Population:** 623,652
- **Religion:** 31.1 per cent Christian, 13.3 per cent Islam, 3.3 per cent Hindu
- **Ethnicity breakdown:** 50.3 per cent non-Dutch of which 13 per cent Muslim



Minke van Wingerden,  
co-founder of the  
Floating Farm concept

**TIMELINE**

- **1930**  
Waal Harbour completed, Rotterdam officially home to largest dredged harbour in world
- **1940**  
German army invades Netherlands, bombing of Rotterdam follows. 80,000 civilians are left homeless
- **1950s**  
Rotterdam rises from the ashes and is gradually rebuilt
- **1965-1973**  
Rotterdam experiences rapid economic growth, people start to emigrate here from the Mediterranean and the Dutch colony of Surinam
- **1980s**  
Rotterdam council introduces architectural policy. Inventive new buildings start to emerge
- **1990s**  
New business centre established in the city
- **2001**  
Rotterdam named European Capital of Culture
- **2015**  
Rotterdam voted European City of the Year by the Academy of Urbanism

**I**n a quiet, sheltered bay on the outskirts of Rotterdam, Minke van Wingerden is busy showing me a robotic milking device shrouded in red and white tape. ‘The cows will come in here to be scanned,’ she says, motioning to a metal gate. Over her shoulder, I see a ship sailing out to sea. ‘The milking robot then opens or closes according to how often the cow has been milked, and if they haven’t been through that day it lets them in,’ she says matter of factly, as if cows being milked by a robot on the ocean is something fairly mundane and normal.

We’re standing on board the world’s first floating dairy farm. The design team believe it’s an exciting development for a number of reasons: bringing fresh food closer to residents in fast-growing cities, eliminating the environmental toll associated with transporting food long distances, and making use of unused space.

The farm is based in the dock area of Merwehaven on the outskirts of Rotterdam itself



The concept first came into the public’s consciousness several months ago and instantly generated a buzz of interest. Who would think of, let alone want to build, a floating cow farm? What does this mean for cities? Is this what our future food will look like?

I could have guessed that the floating farm would come from Rotterdam – the city famous for its modern, funky architecture and wacky ideas – long before I learned the address. Arriving at my hotel the night before my floating farm visit, I was greeted not by a receptionist but a computer screen. A quick QR code scan and I was issued with a wristband – a key to a whole world of excitement from the self-serve beer tap to a vending machine of dinner options. And my room wasn’t actually a room, it was a pod fitted with a double bed which glowed all colours of the rainbow (controlled using an app, of course). In these sort of surroundings, a floating farm full of cows seems to fit the bill nicely.

The first word that pops into my head as I walk around the floating structure is ‘eerie’. The way the metal creaks in the light wind, and the sound of water lapping against the base of the farm. It’s too quiet. There’s a distinct lack of life on board: the cows are yet to arrive at their new home and all that stands in their place is a creepy cow-sized ceramic statue.

Minke continues the tour of the structure, showing me the automated feeding system that collects food from the lower level and transports it via conveyor belt around the farm and into the feed lots. 80 per cent of the cow's fodder will come from city waste, including by-product from a local brewery, grass from sports fields, bran from bakeries and potato peel from French fry companies. The cows wear collars with sensors that monitor their vital signs, and the farmer – yes there's a farmer – keeps an eye on everything using an app. Downstairs, I'm shown the machine which processes the cow's waste, and the machine that will clean 800 litres of milk a day for locals to drink.

'This is about reconnecting citizens with food production. People have no clue how much energy goes into your food before you can eat it,' says Minke, referring to the huge food web of production from growing food to transporting, packaging and finally eating it. Minke believes that by having the farm in the city, and launching education programmes for local children, they can discourage food waste.

There couldn't be a better location to make this point. The Port of Rotterdam is by far the biggest food import/export hub in Western Europe: millions of tonnes of fruit and vegetables make their way to the consumer via Rotterdam. If you live in Europe and eat

citrus fruits, bananas or grapes, chances are they've come through here all the way from countries such as Brazil, South Africa and Costa Rica. The floating farm sits right next to a huge fruit warehouse and giant ships stacked high with containers bringing Europe's breakfast, lunch and dinner glide into the port. The floating farm might be small, but juxtaposed against this glaring example of the international food trade network, it makes a mighty statement about the sustainability of our food systems.

### FLOATING FUTURES

How does one come up with a floating cow farm? The idea came to Peter van Wingerden, lead designer on the project, in 2012 when he was involved with a housing project in New York. While there, Hurricane Sandy hit, flooding Manhattan and the Bronx. 1,500 food trucks a day would come into the city bearing fresh fruit and vegetables for citizens, and suddenly their access route was under water. After two days the shelves were empty. 'It brought the idea "why not grow fresh food in the city, near the people?" We realised we needed to shorten the transportation chain,' says Minke.

Minke and the team launched the floating farm to be scalable. Although the Rotterdam farm is only going to be home to 40 cows, it acts as a research lab, testing out



Markthal – an indoor food market and example of Rotterdam's design ethos



Eighty per cent of the cow's fodder comes from local city waste including potato peel from nearby French fry vendors

what works and what needs to be improved so it can be replicated across the globe. For example, 'Singapore imports over 95 per cent of its food – it's surrounded by water so why not produce it by itself?' Minke says. Moreover, as human-activity driven global warming contributes to global sea-level rise, the issue of cities ending up underwater is a major issue. Taking to the water is, in Minke's mind, the solution.

And she isn't alone. Why only build a floating farm when you can build an entire civilisation on water? This is the thinking of the United Nations which recently backed the work of visionary architect Bjarke Ingles and his floating cities concept, arguing that these offer a viable solution to climate change threats facing urban areas. 'We must build cities knowing that they will be on the frontlines of climate-related risks – from rising sea levels to storms. Floating cities can be part of our new arsenal of tools,' said UN deputy secretary-general Amina Mohammed. Ingles' cities are designed to be wholly sustainable, with food grown on structures above and under water, and drinking water produced from desalination machines that run on renewable energy. There aren't any current plans to bring livestock to the floating cities of the future though, with the majority of food either plants or sea creatures.

### CULTURE

- **Indonesian food:** As a former Dutch colony, Indonesian food and flavours features strongly in Dutch cuisine. Rotterdam has many Indonesian restaurants, and French fries are often served not just with mayonnaise, but also peanut sauce.
- **Madam Rotterdam:** An English-language podcast in which host Maria Bahamam interviews interesting and inspiring people in the city. Including a couple who provide virtual reality entertainment to children in hospital and the founders of the Netherland's first cultured yoghurt company.
- **Why the Dutch are Different:** The first book to offer an in-depth look at Holland and its residents, by Brit Ben Coates (who now lives in Rotterdam). Or, for a shorter option touching on some of the themes in the book, try the BBC article 'Where Dutch directness comes from'.
- **Rotterdam – Invasion of Holland:** Author Wilhelmina Steenbeek explores the prelude to World War II, the short battle the Dutch fought, and the bombing of Rotterdam.
- **500 Hidden Secrets of Rotterdam:** A guide-book written by locals for tourists that don't want to be tourists. It recommends quirky spots like a former subtropical swimming paradise where you can grow your own oyster mushrooms, showcasing the best of the city.

► **CLIMATE**

■ Ninety per cent of the city of Rotterdam lies below sea level. But climate change here is considered an opportunity for invention, creativity, and business. Dutch businesses dominate the global market in high-tech water management solutions, and delegates from across the globe visit Rotterdam to see the port city's solutions as climate change creates stronger storms and gradual tide rising. The government's design plan is called Room for the River, and focuses around working with water rather than trying to overcome Mother Nature. The thinking on this changed in the 1990s when flooding caused the evacuation of hundreds of thousands of citizens. Speaking to the *New York Times*, government adviser Harold van Waveren said the floods 'were a wake-up call to give back to the rivers some of the room we had taken.'



Solar panels surrounding the floating farm provide a sustainable power source

► **PHYSICAL GEOGRAPHY**

■ Rotterdam is a major European port and the second largest city in the Netherlands. The New Waterway canal links the city to the North Sea - the world's most heavily navigated sea - and the New Meuse River also passes through which connects Rotterdam to the Rhine. The economy is still almost completely based on shipping, with the city being one of the biggest grain and cargo harbours on the continent of Europe.

► **LINKS**

- **Floating Farm** - [floatingfarm.nl](http://floatingfarm.nl)
- **IPBES Report** - [geog.gr/ipbes](http://geog.gr/ipbes)
- **Bjarke Ingels Group** - [big.dk](http://big.dk)

**FLOATING FOOD**

So is the floating dairy farm what the future of food might look like? There's no question that our food systems need to change drastically: recent reports show that the global food system is responsible for a third of all greenhouse gas emissions. Kate Brauman, author of the recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report, which details how human activity threatens one million species with extinction, says the way in which humans produce food, and the type of food we eat, is a major issue. 'People have been making an immense impact on the planet. Agriculture is a great example of this... we're degrading soils, losing water, losing pollinators. All of these things are really important for our future ability to produce food,' she says.

Minke agrees. If we keep producing food [the same way as now] we cannot feed the world. Arable land is being lost,' she says. Yet, the livestock sector specifically is responsible for between 37 and 49 per cent of the greenhouse gas budget decided in the Paris agreement. Given all this, are floating cows the answer?

Minke calls the cows on the floating farm 'upcycle machines.' 'You put food and water in and it gives you nutritious food and fertiliser back,' she says with a chuckle as we walk down the metal ramp and back to her office. The cows themselves might not give such a positive assessment of their situation though. Once on board the floating farm, they will be impregnated to stimulate the production of milk. When they give birth, their calves are moved to a nearby field and the mothers denied access to them. The process is repeated several times, until the adult female passes reproductive age, when she's taken to the slaughterhouse. The female calves then follow the same fate as their mothers, and male calves are taken to slaughter as soon as they're fully grown. Throughout my visit Minke tells me that animal welfare is of high priority to the team, but there doesn't seem to be any real improvement on traditional factory farming at the floating farm.

And not everyone is as positive about the potential of the new farm as Minke. Author of the landmark report *Healthy Diets From Sustainable Food Systems*, Professor Walter Willett MD, said of the Rotterdam floating farm: 'This sounds like a supremely bad idea. The Netherlands certainly does not need more milk; the amounts consumed now are much higher than needed for bone health.'

His report argues that: 'Transformation to healthy diets by 2050 will require substantial dietary shifts. Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50 per cent. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits.' His conclusion to the floating farm idea is that, 'this one will probably sink rather than fly.'

Still, the potentially misplaced enthusiasm of the floating-farm creators doesn't stop here. The team now has designs for new farms, which will be built in the next few years. Watch this space for a floating vegetable garden and floating chicken unit, all of which could be coming to a city waterfront near you. ●