

Aquaculture

Sustainability drives growth Happy Shrimp Farm

The industrial area of Rotterdam Harbour in the Netherlands does not seem to be an obvious location to find tropical shrimps. However, by using the waste heat from a neighbouring power plant, this area turned out to be the perfect spot for the Happy Shrimp Farm, home to two million Pacific Whites. Feed Tech talked to Gilbert Curtessi, managing director and shrimp fanatic.

By Emmy Koeleman

Everything at the Happy Shrimp Farm is done in the spirit of sustainable development, of which re-use of residual heat is the main part. An idea that Gilbert Curtessi and commercial director Bas Greiner picked up in 2002 when they were both studying the possibilities of co-siting: sustainable production by using the available nearby utilities, waste and space. Looking at the industrial area of Rotterdam, their attention was drawn to the power plant of E.ON Benelux. “We both like fish and our travels to Japan, China and Brazil inspired us to start a fish farm that could use the residual heat from E.ON. This is not only cheaper, it also is more sustainable because normally the heat is lost as the power plant releases it into the air,” states Curtessi.

Finding the right specie

After learning that aquaculture was possible by using the residual heat from E.ON, the next question was then: what kind of fish will be used? “Possible candidates were the Red Snapper and Tuna,” explains Curtessi. However, Red Snapper is a carnivore and cannibalistic and therefore not suitable for housing in basins. In addition, they need 5 - 6 kg of feed to grow one kg of fish. To grow one kg tuna you even need 16 kg of feed. “For shrimps it is a different story,” says Curtessi. Shrimp have a far better feed conversion rate; for one kg shrimp you approximately need 1.5 kg of feed. In addition, it takes seven months to grow an adult shrimp, a process that can take two years in Red Snappers, for example. Eventually, the search for the ideal shrimp led the Dutch duo to the Pacific White Shrimp (*Penaeus vannamei*). This shrimp



Trained as an environmental geographer, Gilbert Curtessi has turned himself into a shrimp expert and sustainable entrepreneur.

specie eats more algae than other tropical shrimps, which makes this specie more efficient in terms of feed. In addition, they are more vegetarian than its fellow specie Tiger Shrimp, which makes it easier to use vegetable ingredients (soy, corn and starch) instead of fish meal (an ingredient that is getting scarcer and more expensive). Curtessi explains that the White Shrimp variety is also very popular in the market, because it has a better taste and texture than the Tigerprawn (*Penaeus monodon*).

Sustainable approach

As mentioned before, the farm is co-sited with the power plant from E.ON, right in the middle of the

Aqua meets horti

The ideas from Curtessi and Greiner do not stop with shrimps. The wastewater, containing feed waste and nitrogen rich shrimp manure turned out to be a very useful medium for certain vegetables to grow on. Curtessi and Greiner therefore have recently started a new chapter in the race for innovation: the company Green & Blue. This saltwater vegetable nursery is a cooperation between Taste of Nature BV, Koppert Cress and Happy Shrimp Farm. It is located above the existing shrimp basins and uses an infrastructure and its resources to produce salty vegetables such as sea lavender and glasswort. "This approach shows that certain types of fish and shrimps can be grown in combination with agricultural vegetables or plants. This makes an existing production facility more efficient because water and heat can be re-used", explains Curtessi. The steady climate conditions of the farm during every season of the year, makes it possible to produce the salty veggies all year-round.



Glasswort is naturally found in the Wadden Sea and along the coastal area of Southern Holland.

industrial area of Rotterdam. "We installed a 2.5 km pipeline to the E.ON plant and we recover the residual heat (60°C) from the industrial process," says Curtessi. The waste heat is used to warm the farm's basins to a constant 30°C (the optimal temperature for the tropical shrimps). This efficient use of energy resources is a main issue for the Happy Shrimp Farm. "But we also want to raise our shrimps in a sustainable and ecological way," comments Curtessi. The tropical shrimps found on the menus in European restaurants are primarily imported frozen from Asia and Latin America. According to Curtessi, these imported tropical shrimps have two major disadvantages; firstly they are frozen (restaurants always prefer fresh) and secondly these shrimps are often produced at farms that largely pollute natural mangroves –threatening the coastal wetlands where many fish live and breed. "We produce fresh shrimps for the local market". This is not only better for the environment and more sustainable; we also make the customers happy because we can offer them fresh shrimps, every day, the whole year round. Sustainable production also means that Happy Shrimp does not use any antibiotics or other growth promoting or water improving additives and chemicals on the farm. The larvae (the size of a pin-head) are bought from a SPF (Specific Pathogen Free) farm that raises these larvae on land (instead of catching them from the sea). This makes the larvae free of diseases, which is very important for Happy Shrimp to minimise the risk of importing shrimp viruses. Each batch of larvae can be tested for viruses at the CIDC in Lelystad. After that, the larvae are kept in quarantine tanks for one month before they are placed in one of the 24 basins.

Happy Shrimp aims to grow its own larvae soon. "In theory you could say that we are an ecological shrimp farm, but there is simply no label for ecological shrimps", Curtessi explains. However, he and Greiner are working with the European Union to create such an Eco-label for tropical shrimps, which is expected to be ready in 2009.

Algae production

Algae are an important ingredient for the Happy Shrimp Farm. Firstly, they keep the water clean, because they take up CO₂ and produce oxygen, which is taken to every corner of the basins by an ingenious recirculation system. Secondly, the algae serve as a valuable feed ingredient for the shrimp. The algae are currently bought from different suppliers, but next year the Happy Shrimp Farm will host a pilot plant for its own algal production system. In this



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The farm covers an area of 5,000m² and is located next to the power plant of E.ON Benelux. A 2.5 kilometre connecting pipe enables Happy Shrimp Farm to re-use the waste heat from the power plant to keep the 24 basins at a tropical temperature of 30°C.

system, waste from the Happy Shrimp Farm and the E.ON power plant will be used to grow the algae. “But using the algae only for Happy Shrimp is too limited,” says Curtessi. He explains that algae are a very interesting type of vegetation. Because they are able to consume large quantities of CO₂, they are a powerful weapon against global warming. In the future, CO₂ can be isolated from the air and injected in (created) algae ponds to neutralise them.

“Furthermore, algae biomass can be used as a source for bio diesel, food supplements, natural colorants, cosmetics and even pharmaceutical applications,” Curtessi continues. In addition, algae are about ten times more effective as a bio-diesel producer than other energy crops. That is of particular interest now that world supplies of feed and food crops are becoming more limited.

More farms in Europe

The ideas of Curtessi and his partner Greiner are endless. “At our current location in Rotterdam, we can easily double or triple the production capacity,” says Curtessi. Furthermore, the shrimp farmers are planning to build three farms in Germany (Berlin,

Munich and Hamburg), which all located near power plants from E.ON. “All we need are big cities where you can find both residual industrial heat and a consumer market for fresh shrimp,” explains Curtessi. The aim is to have 25 Happy Shrimp Farms up and running across Europe within five to ten years, but also non European countries are being looked at. Regarding competition, the Dutch are optimistic. Since their kick-off in 2006, there have been a few small other initiatives. However, their production output of those small companies is a fraction of the Happy Shrimp Farm’s output. “Our approach is different and we have learned a lot from the first (pilot) farm in Rotterdam. In July of this year, the first adult shrimps have been delivered. An event that did not go along silently. The first catch was auctioned during a festive ceremony (called Night of the Prawns) of which the proceeds (€25,000) will go to the World Wildlife Fund. “This is just the beginning,” says Curtessi. “The next step is expanding the happy shrimp concept to the rest of the planet and we hope that other companies become enthusiastic about co-siting and that more consumers will eat shrimp; Happy shrimps of course”. ●