From thesis to pig's toilet

A pigs' toilet, an animal-friendly barn or a micro-fermentation plant; the Pig Innovation Centre at Sterksel tests new ideas thought up by business people and scientists. Every year thousands of farmers go there for advice. 'Farmers don't want reports, they want implementation.'

TEXT ALBERT SIKKEMA **PHOTOGRAHPY** MARCEL VAN DEN BERGH

Three hairy pigs that have dug up the entire garden are the centre of attention outside the Pig Innovation Centre (VIC Sterksel), part of Wageningen UR. They are 'half Hungarian', says the centre's manager, Mart Smolders. The father is a Hungarian curly-hair hog, a pig in sheep's clothing, which some VIC employees came across in Hungary. 'They have an excellent meat flavour and an interesting fatty acid composition', says Smolders. 'We inseminated our sows with sperm from this curly-hair hog. The meat would be suitable for a niche market. Many visitors have shown interest, for instance farmers who want to sell their pork door to door. The three curly-hair hogs are a source of inspiration.' This makes them a perfect fit with the Sterksel philosophy: inspiration through implementation.

The Pig Innovation Centre develops new concepts for pig farms, such as a new nursery for sows, new feed systems and a pigs' toilet. Sterksel led the way in developing group housing and reducing antibiotics use, and it has a number of welfare projects. Its work is appreciated by pig farmers, the government and civil society organizations alike. Last year, Sterksel had more than ten thousand visitors, including around three thousand pig farmers during the annual innovation days in June. The centre also frequently hosts excursions from abroad and it gives vocational training students practical lessons on the farm.

THREE WELFARE STARS

The latest innovation, currently under construction, is the Starplus barn – pig housing with a covered free-range area, manure separation, manure fermentation and lots of light. The plan is for the new barn to get three welfare stars from the Dutch Society for the Protection of Animals (another frequent visitor). 'Starplus was conceived by three companies that developed the expertise jointly,' says Smolders by way of illustrating the Sterksel approach. 'They were each investigating different aspects; then we brought them together to see if they could integrate their systems for manure separation, mini-fermentation and a new barn design. They invested their own money and the government provided support for the construction. We are now going to develop the concept further.'

Martien van Kempen, himself a pig farmer, is one of the initiators and investors. If the concept catches on, he will earn money from the sale of the barn to other pig farmers. He thinks there are advantages to building an innovative barn like this at the experimental farm. 'Sterksel is pragmatic and flexible; the staff help you find solutions. They are a young team without preconceived ideas and very open to innovation. Another key feature is that Sterksel enjoys the support of pig farmers, who are frequent visitors. They have to be able to see for themselves how a new barn like this works. Sterksel is honest about what is feasible, which creates a support base for innovations.'

PERFECTING NEW IDEAS

Centre manager Smolders draws a diagram on the board. 'Look, a farm's existing system has been developed to perfection. But if you introduce an innovation, the effectiveness may drop to 70 percent. Pig farmers will not take that risk, so our task is to develop a new idea and increase its effectiveness from 70 to 110 percent, until the concept is ripe for practical application. Pig farmers can view the prototype here and get practical information from our experts and animal keepers. We don't buy any of the material, we solve the teething problems.'

Smolders emphasizes that the innovation centre does not produce reports. 'You write reports for your fellow researchers, not for farmers. They don't want reports, they want practical implementation.' Sterksel puts the application of science on show, which leads to interaction and discussions between visitors, and this in turn generates new ideas. 'That is how the Prodromi barn originated. Fourteen sow farmers wanted a better design for the sows' nursery so that the sow and her piglets would have more room. Then we brought in barn construction firms to join in developing a new concept.' Ideas can also come from civil society organizations such as the Society for the Protection of Animals. 'We are a member of the Pig Network, a farming practice network for the development of new products and concepts under the supervision of the Society for the Protection of Animals.

One example is the 'pigs' toilet', proposed by Cor Suselbeek of Dorset Farm Systems. This is a porous floor system in the corner of a barn at some distance from where the pigs feed and rest. 'I developed that idea back in 2004 but the trials never took place and so I dumped the toilet in the attic.' Eighteen months ago he got a phone call from Wageningen. The toilet was retrieved from the attic and Suselbeek started a trial at Sterksel.

'In the past there were no clear agreements between businesses and the researchers so everyone just did their own thing,' recalls Suselbeek. 'Now there is more collaboration and discussion, thanks to Mart Smolders. We businesses deal with the technical aspects and we collaborate with Sterksel in investigating the practical applications. That works well.' What is more, says Suselbeek, businesses are now swapping know-how. He improved the toilet at Sterksel by studying a construction in another practical experiment.

NOT LYING ON THE PIGLETS

Wageningen University, part of Wageningen UR, is now a member of the Pig Network too. 'We collaborate a lot with Bas Kemp's Adaptation Physiology science group,' says Smolders. 'We are currently developing new concepts on the basis of three PhD theses.' One is already being applied in the Prodromi barn, where a nest has been created for the sow so that she does not lie on the piglets. Sterksel is also implementing a method whereby piglets learn from their mother how to eat solids, and a more gentle weaning process whereby the piglets remain in the nest while the mother is able to walk about. That makes the weaning process from milk to solids less abrupt, making the piglets less sus-

Sterksel is testing several different systems rather than putting all its eggs in one basket

ceptible to disease. Last year, Wageningen UR's Animal Sciences Group awarded Sterksel its Innovation Prize for these applications of Wageningen research.
The high levels of antibiotic use on pig farms have attracted considerable attention, but VIC Sterksel solved this problem years ago. 'The key to our approach is that we try to prevent disease spreading through the farm,' says Smolders. 'We adopt hygienic working methods and keep pig families together after weaning so we don't have diseases spreading from family to family. That reduces the consumption of antibiotics by 80 percent. The solution does not come out of a bottle; pig farmers will have to change their working methods.'
Moreover, Smolders is quick to add, the current low levels of antibiotics use at the innovation centre are not a given. 'Take the situation where we test a new housing system that does not yet meet all the health criteria. Then you might need to increase antibiotics use temporarily.'

BIG MANURE FERMENTATION PLANT

Sterksel is not putting all its eggs in one basket when it comes to the environment either. Instead it is testing several systems. There is a big fermentation plant on the premises that produces enough energy to power 1500 homes. That is great but it does mean Smolders has to mix maize, i.e. valuable animal feed, in with the manure to achieve that level of energy production. In the light of the ongoing 'food, feed or fuel' debate, this is not an ideal solution. There is also a mini-fermentation plant that extracts energy from manure without the addition of other materials. This mini plant was developed jointly with suppliers and it makes the innovation centre energy neutral.
The farm's third and newest energy producer is a micro-fermentation plant from a company that supplies fermentation plants to African villages. VIC Sterksel staff came across them and wondered whether they would work in the Netherlands too. The small-scale tank fits anywhere and farmers can use it to heat the barn for the piglets or to power their car.
Visitors can decide for themselves which of the three systems would suit them. 'We have not made a commercial investment in manure processing,' explains Smolders. 'I really want ten projects for manure processing, and extracting and recycling the minerals in the manure.' He says this diversity is necessary as pig farmers are going to be specializing in a certain market segment and will choose the farm systems and technologies appropriate for that segment.

PIGS AS A TOOL

'VIC Sterksel is not a pig farm. We see the pigs as a tool for developing knowledge,' says Smolders. Even so, he does run a farm with 330 sows and 2400 pigs bred for meat. This farm has a turnover of 1 million euros a year. He also earns 0.6 million euros from the production of biogas and 0.1 million from excursions. But that is not the innovation centre's main business. Over the past few years Sterksel has been getting more than 1.5 million euros in project revenue, compared with 0.6 million ten years ago. That growth has led to an increase in staff from seven to seventeen.
Smolders is about to leave his job as manager of VIC Sterksel. He is going to MS Schippers, a company that supplies equipment and systems to livestock farms, where he will be managing the Pigs Division. However, even on his last working day he will be signing a collaborative agreement for a sustainable pig farm with fifty businesses in the pork supply chain that all make use of the experimental farm. 'SME business people are innovative types. They are rather missing out in all the to-do about the top sectors so we want to increase our visibility as a group.' Of course, the signing will be taking place at Sterksel, the linchpin of the pig farming sector. ■