‘Mansholt model is about to expire’

Next Level Circularity

How can you improve the Dutch dairy industry? This is the central question that Robert Horst tries to answer in his thesis. One of the remarkable answers: integrate human poop in the system. Also: increase the lifespan of cows. And farmers should try to show more often what they already are doing.

Source: Melkvee magazine | Dutch Text: Gineke Mons | English translation: Jacco Leguijt

Circular agriculture. Minister of agriculture Carol Schouten kept talking about it during the presentation of her Agricultural Vision in September, 2018. In her vision, circular agriculture plays a central role. The term intrigued Robert Horst (26). Growing up on a dairy farm with 90 cows in Onderdendam in the Dutch province of Groningen, he studied agricultural entrepreneurship at the Van Hall Larenstein Institute in Leeuwarden. When he wrote his thesis for his master Management Economics and Consumer Studies at the Wageningen Agricultural University, he made circular agriculture it’s focus. “I did not want to just write my thesis for the professor, Emiel Wubben, I actually wanted to produce something that was meaningful and practically applicable”, tells Horst, who now works as consultant for dairy cattle advice bureau in Leeuwarden. “My goal was to create a working model for circular agriculture that is maintainable and socially acceptable, both for the farmer and for society.”

The main question of his thesis is: how can the circularity of the Dutch dairy industry further be improved? One of the challenges was that there is no way to measure the circularity objectively. At first, Horst assumed that both the production and the reduction of carbon equivalents would be a good way to measure it, but it turned out to be too one-sided, he says. “Measuring the circularity of the dairy industry requires an integrated approach. The biodiversity monitor seemed to be the best option available.”

Eventually he developed a new, integral model to measure the effect of circular measures. It works with three categories: it doesn’t fit, it fits, and it fits very well. All in all, he found 26 concrete measures through literature study, and assessed them. “One of the measures that scores best, is increasing the lifespan of cows.” Other 'circular champions' from the 'fits very well' category: reducing ammonia emission, manure separation/manure processing, adjusting the laws concerning manure (more animal manure, less artificial fertilizer), processing waste streams, both from field agriculture and the human food industry, using animal protein from waste from butchering, and saving energy annex the production of green energy. If you focus on the carbon footprint/carbon reduction, separating manure (liquid and solid), cooling the manure storage and the production of green energy score highest, discovered Horst.

Twenty stakeholders

The student also questioned twenty stakeholders from the dairy industry: which of these 26 measures do they view as opportunities to improve circularity? This group contained both dairy producers and people from world of dairy, animal food, education and science and specialists in the field of nature/environment and manure. “The majority of the stakeholders chose for increasing the lifespan of cows”, says Horst. Stakeholders also chose for adjusting manure laws, aiming for ground-bound dairy operations and cooperation with arable farmers. Also grazing – where urine and manure are naturally separated – was chosen often. “The outcomes are not really surprising”, admits Horst. “Dairy farmers have been taking this measures for a long time. Farmers see that all these measures are related and influence each other. They want an integrated approach. Because if you focus a lot on one measure, it influences the other ones too, in a positive or negative way. This makes it a complicated process.”

There are obstacles for improving circularity, too. The manure legislation was named often as a major obstacle, as well as prohibition of the use of animal protein in animal feed. A required amount of 80 percent grass for derogation was also described as one of the obstacles.

Horst also asked his respondents if they knew any measures that had not been described in literature. The answers to his question were surprising, he says. "Number one is: communication. Farmers must show and tell what they're doing." A vet put it like this, says Horst: "Society is changing. Your customer is the consumer who cycles along your fields. That consumer feels a certain way about what he sees, and as a dairy farmer, you have to try to anticipate to that."

What's important is that dairy farmers make that change themselves, according to Horst. "You shouldn't make changes because your dairy processor demands is. You should make changes because you want to, because you like it."

Another suggestion: integrate human poop and urine in the cycle. Horst: "This is a large part of the cycle that we currently lose, because nothing is done with it." Integrating human faeces is far from easy , partly because of the residues from medicine and hormones (contraception) that it contains.

A third tip from the respondents: look at how you can reduce your indirect use of energy. Or, as one dairy farmer put it: "If I save one liter of diesel with my tractor, I save four liters of gas indirectly. Because the production and transport of diesel oil costs fuel too."

The thesis, written as a research task within the Dutch bank ABN AMRO, was finished by Horst in 2019. What does the farmer's son think of the current possibilities to improve the circularity of the dairy industry? "We should limit external inputs as much as possible, and decrease nitrogen and methane losses", he says. "Neither is the current system with grate floors very useful, either. Farmers should change to smart flooring systems that separate solid manure and urine." This will yield two separate manure flows, with a quick working thin nitrogen-based fraction and a phosphate-rich thick fraction. "But it's hard to put this into practice."

But, more importantly: society has changed. "The Mansholt model has worked well for a number of decades, but it is past is expiration date now", says Horst. "Farmers and civilians will have to change. Consumers throw away one third of their food. The dairy sector can and must move towards a higher level of circularity as a whole. There are many steps to be made. And farmers want to make those steps. They just want to earn it back in the market."

The Netherlands: a forerunner in circular agriculture

In September 2018, Dutch agricultureminister Carola Schouten presented her vision for Dutch agriculture. In it she writes: 'Our current agricultural system is a chain, in which the chains are acting in a way that serves their own economic interests best. Each group uses the resources at their disposal, processing them in such a way that they have low costs and high profits.'

But individual groups are looking too little at the system as a whole. 'This is a problem, because there are leaks in the systems, resources are squandered, used in inefficient ways or there are unwanted side effects. An example of this is that nutrients are leaking into the soil and that waste streams are neglected. This has to change. After all, we only have one planet Earth with a finite supply of renewable resources. This way, production is damaging the ecosystem by putting pressure on biodiversity, polluting the soil, and changing water and air and the earth in a greenhouse which renders large parts of it uninhabitable and unproductive.'

We should change, says Schouten: we should move from continually lowering production costs to a continuous lowering of the use of resources. 'This change is possible when we work towards a circular agriculture as the ecologically and economically vital and normal way of production.' This way of production must be based on the economical strength of collaboration between groups in the agricultural sector and on the support and trust from organisations in society. Food safety still comes first, of course. The current chain, with a beginning, an end and leaks in the links – has to change into a system with minimal unnecessary losses. 'That way, agriculture, horticulture and fisheries can become part of a circular food system. The aim of this department is that cycles of nutrients and resources are closed in 2030 at the lowest level of scale possible – national or international - and that the Netherlands are a forerunner in circular agriculture.'