

## FOODSHOT GLOBAL GROUNDBREAKER PRIZE

# Producing food and saving the earth

**What would a healthy diet look like that does the least possible harm to the climate and the environment? Hannah van Zanten is figuring it out in the Circular Food System model, with which she won the Groundbreaker Prize. 'If livestock are fed on waste streams, there is no need to import soya from Brazil'.**

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PHOTO BART VAN OVERBEEK

Hannah van Zanten

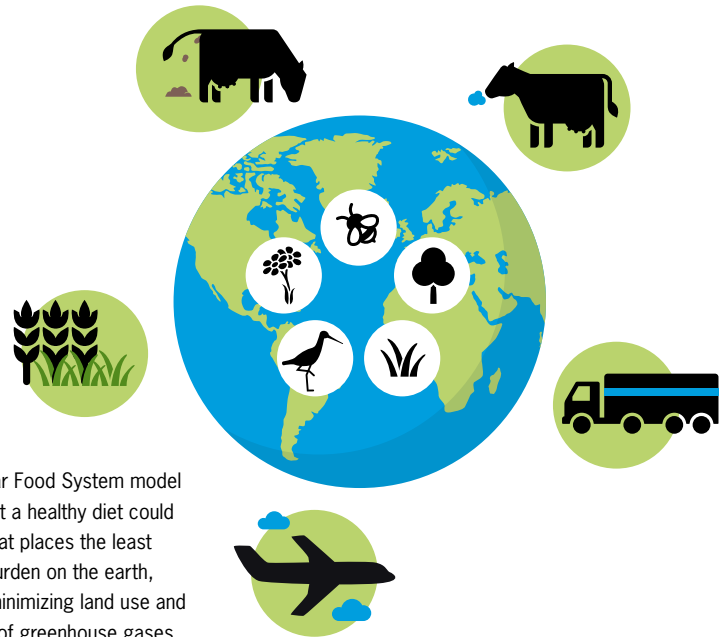
**T**he livestock industry has a big impact on the environment. I pondered what we could do differently,' says Hannah van Zanten, associate professor in the Farming Systems Ecology chair group in Wageningen and visiting professor at Cornell University. With her team and other colleagues from Wageningen and elsewhere, Van Zanten developed the Circular Food System model, which maps out what a healthy diet of plant and animal proteins looks like when it also respects the Earth's carrying capacity. For every continent, the model takes into account greenhouse gas emissions from food production, land use, fertilizer inputs, the impact on biodiversity, and how to make such a system financially viable. The European model is very nearly ready and the global model is in the making. It also incorporates the impact of food transportation between continents. In January, Foodshot Global awarded Van Zanten the Groundbreaker Prize for her

work: 150,000 dollars to be spent on research.

### EATING RESIDUAL STREAMS

'The food system that colleagues and I have developed is circular and targets an optimal combination of plant and animal proteins,' says Van Zanten, who obtained her PhD cum laude in 2016 for her thesis on the role of livestock farming in a circular food system. She found there was a valuable role for livestock if you feed the animals on food scraps and waste from the food industry, and graze them on grasslands that are unsuitable for arable farming. 'If livestock are fed on these waste streams, we can grow crops for human consumption on the land where we now grow livestock feed. That way there is much more food for human consumption and the livestock feed, such as soya from Brazil, does not have to be transported halfway around the world,' explains Van Zanten. It also means that we can continue to eat meat and milk, but about 60 to 80 per cent

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less than our current rate of consumption. After obtaining her doctorate, Van Zanten was awarded a Veni grant by the Dutch Research Council for follow-up research into the international circular food system that she envisages, and work started on developing the model. ‘We can use this to study how our ideas play out in practice. After all, the food system is very complex and there are many conflicting interests involved in it.’

The Circular Food System model shows what a healthy diet could look like that places the least possible burden on the earth, partly by minimizing land use and emissions of greenhouse gases and environmental pollutants.

## PORK OR CHICKEN

Protein from insects is frequently proposed as an alternative to animal protein. But breeding insects requires a lot of electricity, Van Zanten notes. Moreover, the insects eat food leftovers that are currently used for biofuels. ‘Our model maps the relations between these different chains, generating broad analyses and enabling us to see how we can manage the trade-offs.’ So for instance, are we primarily aiming at a healthy diet or at minimizing the environmental impact? To give an example: in an environmentally optimal circular system, it is better to keep dairy livestock (which produces both milk and meat) and pigs, because these animals are best suited to eating grass and residual streams respectively. But for our own health, it is better to avoid red meat and eat chicken. Van Zanten, PhD student Ben van Selm and their colleagues published figures in *Nature Food* earlier this year showing that in an optimal circular system, greenhouse gas emissions would be reduced by up to 31 per cent and the use of agricultural land by up to 42 per cent, compared to the situation with a healthy diet according to the international standard. ‘We are now looking

at what happens if we in Europe take a diet that meets all the health requirements as our starting point. How can we reduce greenhouse gas emissions and land use in that scenario?’

## GAME

A model with a thousand rules and formulas is not very appealing, so Van Zanten and her research team are developing a game that helps players get to grips with it. The players can adjust the preconditions and goals, changing livestock numbers or growing different crops and then seeing the effects on things like greenhouse gas emissions straightaway. ‘Once stakeholders see for themselves how they can be part of sustainability, things will really change. That is where I want to get to.’

Van Zanten wants to use the Groundbreaker Prize money, to bring her model to the attention of companies, consumers and governments in various countries. ‘FoodShot Global has a huge international network and specializes in campaigns that make people think about certain themes.’ ■

[www.universityfundwageningen.eu/research](http://www.universityfundwageningen.eu/research)

## WAGENINGEN AND FOODSHOT GLOBAL

FoodShot Global is a US-led collaboration between venture funds, banks, corporations, universities and philanthropic foundations that seek to contribute to a sustainable food system. Wageningen is involved in the network as a knowledge partner. FoodShot Global focuses on scientifically sound concepts and supports their application in practice, by providing credit to start-ups and organizing competitions such as the annual FoodShot Challenges, in which scientists and entrepreneurs can compete for a cash prize for pioneering work. The University Fund Wageningen (UFW) organized internal nominations and a selection procedure for the challenge, and supported Hannah Van Zanten in preparing her entry. ‘We have experience with philanthropic organizations and understand their motives and goals,’ says Fanny Castel of UFW. [www.foodshot.org](http://www.foodshot.org)