

How can we halve nitrogen emissions in the livestock sector?

Concentrate on the cowsheds

The Netherlands must drastically cut its nitrogen emissions from livestock farming, industry and traffic so as to protect nature, says the Remkes commission. Exactly how this should be done, the commission doesn't say. Wageningen researchers offer four options for the livestock sector. With the inevitable ifs and buts.

text Albert Sikkema illustration Geert-Jan Bruins

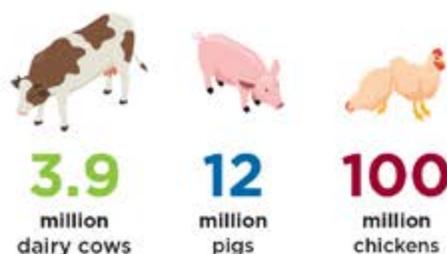
The Remkes Commission, formed to advise the cabinet on short-term solutions to the nitrogen problem (see pp 14-15), published its first report last week. One of its recommendations is that the government should buy up and clean up polluting livestock farms located close to nature areas in the short term. Other farms should install extra emissions-cutting measures. The commission does not suggest by what percentage nitrogen emissions must go down, nor which measures farmers should take to restore nature. Wim de Vries, personal professor in the Environmental Systems Analysis chair group and a nitrogen specialist, does give a percentage. He thinks nitrogen emissions in all sectors, including livestock, have got to be halved. How could the livestock sector manage that?

HALVING LIVESTOCK NUMBERS

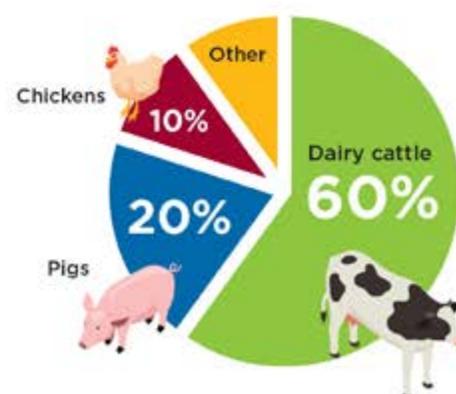
Many politicians and campaigners think halving livestock numbers is the solution. In principle, they are right, says De Vries: halving the number of cows, pigs and chickens would lead to a halving of the emissions from harmful nitrogen compounds such as ammonia (see pp 14-15). But the professor sees other options too. Dairy farmers could aim at reducing

ammonia emissions from manure in the cowshed, for instance.

Within agriculture, dairy farming is the biggest nitrogen producer. The sector is responsible for about 60 per cent of the nitrogen problem, pig farming for 20 per cent and chicken farming for 10 per cent. That is remarkable in itself. Because why do 3.9 million cows produce much more nitrogen than 12 million pigs and 100 million chickens put together? Because the pigs and chickens live in closed sheds fitted with air filters and designed to reduce ammonia formation. As a result, ammonia



Livestock numbers per farm type



Nitrogen emissions per farm type

(in percentage of the total nitrogen emissions from livestock farming in the Netherlands)



emissions in pig and chicken farming have gone down a lot in the past 30 years.

CLOSED COWSHEDS

In the dairy sector, the cows are often kept in open sheds with few emissions-restricting measures in place. Emissions have gone down in this sector too, but that was mainly through injecting manure into the land and reducing the number of cows. So researcher Roland Melse of Wageningen Livestock Research suggests a solution to the nitrogen problem in the dairy sector that is as simple as it is controversial: put the dairy cows in closed sheds with air filters.

Chemical air filters capture 85 per cent of the ammonia, on average. Melse describes his proposal as 'tantamount to sacrilege' because nowadays what we want is open stalls and cows grazing in the fields. But that is precisely the way to end up with a lot of ammonia from cows in the environment.

AMMONIA FORMATION

A colleague of Melse's at Wageningen Livestock Research, Karin Groenestein, has come up with a different solution. She wants to tackle the ammonia problem at the source, namely the moment the substance is formed. That happens when the cow's urine and poo get mixed. You can prevent this by quickly separating and removing the manure. Thinning manure with water, acidifying or cooling manure and reducing the surface it covers also help reduce ammonia formation. With a combination of these measures, dairy farmers can reduce ammonia emissions from cowsheds by over 80 per cent, Groenestein's colleague Andre Aarnink calculated last year. So this kind of 'tackling at the source' can compete with the air filter.

Although it is important to do something about the cowsheds, that won't be enough to halve nitrogen emissions, says Wim de Vries. Emissions from the sheds only account for 30 per cent of the ammonia emissions from dairy farming. Nitrogen also gets into the environ-

FOUR WAYS OF CUTTING NITROGEN EMISSIONS IN LIVESTOCK FARMING

- 1 Less livestock
- 2 Air filters in dairy farming
- 3 Better manure management in dairy farming to reduce ammonia formation
- 4 Livestock feed that contains less nitrogen

ment through the storage of manure and its application on the land, and most of the emissions-cutting measures in this regard have already been put in place. Besides, investing in low-nitrogen sheds costs the farmers money.

LESS NITROGEN INPUT

Wageningen alumnus Frank Verhoeven, one of minister of Agriculture Carola Schouten's advisors on circular agriculture, suggested another way of solving the nitrogen problem in the sector magazine *Boerderij*: halve the inputs of nitrogen in agriculture in the form of artificial fertilizer and concentrated feeds. By purchasing less nitrogen, he foresees that livestock farmers can close the nitrogen cycle. Good idea, responds Wim de Vries. 'That is called the "feedprint". With less nitrogen in the livestock feed, you reduce the amount of nitrogen in the manure and therefore the emissions of ammonia too. But importing less livestock feed does mean you can keep less livestock in the Netherlands, unless you can keep up the milk production with less nitrogen in the feed. Also, this doesn't produce nearly enough of a nitrogen reduction to meet the targets.' Using less artificial fertilizer doesn't reduce ammonia emissions by much, according to De Vries.

Read too The Nitrogen Problem in Five Questions on pp 14-15.