

Special feed halves methane production

December 20 2010, by Albert Sikkema

It is not garlic but nitrate and sulphate that reduces methane production in the stomachs of cows and sheep. If their feed contains a small percentage of these substances the amount of this powerful greenhouse gas produced by sheep is halved, Dutch research by Sander van Zijderveld has shown.

Van Zijderveld, a PhD student at the Animal Feeds chair group of Wageningen University hit the headlines two years ago when he gave cows feed containing garlic. Lab tests with an imitation cow's [stomach](#) had suggested that garlic reduced methane production. Van Zijderveld, who works for feed producer Provimi, had wanted to keep his tests secret, really. 'But there was a journalist in the testing shed who clearly smelled garlic.'

In the end, the discovery turned out to be a disappointment. 'In cows garlic does not reduce the methane production and it also makes the milk smell garlicky.' Neither was the desired effect achieved using linseed oil or powdered yucca plant, which reduced methane production in the lab.

But now Van Zijderveld has discovered two little substances that really do reduce methane production in cows and [sheep](#). He did so thanks to emeritus professor Ron Leng from Australia, who advised adding nitrate (NO₃) and sulphate (SO₃) to feeds. The PhD scholar tested this on 20 sheep on the island of Texel. The sheep that were given feed with 2.6 percent nitrate produced 32 percent less methane. Sheep that were given the same amount of sulphate released 16 percent less methane. And a combi of these additives reduced [methane production](#) by half.

It would be a bit much to add 2.6 percent of these additives, says van Zijderveld. 'If you suddenly give that sort of concentration to the sheep, their blood may be able to absorb less oxygen. That is unhealthy and for that reason these correlations have never been tested. But the Australian professor suggested that the ruminants should be given time to adjust gradually. This enables their stomach bacteria to convert the nitrate into a harmless product from which they can extract nutrients.' Van Zijderveld showed that dosing it like this had no ill effects on the health of the sheep. He published his research on sheep in the Journal of Dairy Science.

Meanwhile, Van Zijderveld has also tested the nitrate on a group of dairy cows. In the [cows](#) the nitrate seemed to be less effective than in the sheep: the methane emissions went down by an average of 16 percent. He is still figuring out why this would be.

Technically speaking, the additives are a success. Livestock farming is a major producer of greenhouse gases, including methane. These are generated in the stomachs of ruminants and are released into the environment via the mouth when they burp.

But however much methane is produced, it remains difficult for Provimi to launch these feed additives on the market. 'Nitrate and sulphate do not raise milk production, so adding them has no economic added value for the farmer', says Van Zijderveld.

Provided by Wageningen University

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