

Traces of cow's methane emissions in the milk

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Wageningen University researchers in the Netherlands are able to determine cows' methane emissions using the composition of fatty acids in their milk. This opens up the prospect of a method for reducing methane production by cows.

Methane is the main [greenhouse gas](#) produced by cows but it is difficult to measure the quantity in practice. The FAO estimates that methane accounts for 52 percent of all [greenhouse gases](#) produced by the dairy sector. Wageningen UR uses so-called climate respiration chambers to get precise measurements of cows' methane production, but that is an expensive technique. These measurements do show that Dutch cows emit 20 grams of methane on average per kilogram of feed, with emissions ranging from 15 to 25 grams. The variation is determined primarily by the [animal feed](#), which is interesting as it means farmers may be able to influence emissions.

The Wageningen UR researchers determined the [methane emissions](#) of one hundred cows on ten different feed rations using climate respiration chambers. They also took milk samples from these cows to determine the composition of the [fatty acids](#) for each cow. Milk fat consists of hundreds of different fatty acids. Fourteen of these fatty acids turned out to have a significant relationship to the methane production. The researchers developed a formula allowing them to predict methane emissions using four fatty acids. These fatty acids are produced partly in the cow's intestines, where microorganisms convert the feed into nutrients for the cow but also produce methane.

The researchers can now use the milk's fatty acid profile to predict the methane production per cow or per farm. Determining the fatty acid composition is a fairly simple operation, which opens up the possibility of measuring methane emissions per dairy farm or cow, says researcher Jan Dijkstra of the Animal Nutrition Group. Moreover, that could lead to recommendations for feed that can reduce methane emissions. The animal feed producer Provimi and the microbiological R&D company Alimetrix were partners in the research project.

However, they are not there yet. 'The relationship between the fatty acid composition and [methane production](#) is based on a relatively small dataset. We need more data to develop a robust indicator. We intend to gather that data in collaboration with international partners.' Dijkstra published his research at the start of this month in *Animal Feed Science and Technology*.

Provided by Wageningen University

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