Abstract 39:

Animal breeding can be used to reduce enteric methane emissions of dairy cows

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The Dutch agricultural sector is facing the challenge to reduce methane emissions by 1 megaton by 2030, and further by 2050. In agriculture, most methane is produced by enteric fermentation of ruminants and emitted in the air through breathing and belching. Animal breeding techniques offer potential to reduce enteric emissions, in a way that is cost-effective, cumulative, and permanent. This will increase the sustainability of dairy farming, and make the sector more resilient to possible future restrictions based on emissions per farm or animal. The aim of our study was to investigate if we can use continuously recorded methane emissions, measured with gas analysers called sniffers, to breed for reduced methane emissions of dairy cows. Sniffers were installed in the feed bin of milking robots, where methane concentrations (ppm) were measured on 14 herds from March 2019 to September 2020. In total, data from 181,597 robot visits of 1,698 Holstein Friesian cows were recorded. Genetic parameters were estimated with a univariate animal model with repeated measurements. Preliminary results show that the heritability was low to moderate and ranged between 0.08 to 0.23, and was highest for weekly mean emissions (0.23 ± 0.02). The genetic standard deviation for weekly mean emissions was 73 ppm, indicating that the genetic difference between the 1% highest and lowest emitting cows is 366 ppm. The preliminary results indicate that there is genetic variation in methane emissions between cows, and decreasing methane emissions by selection in dairy cows is a possibility in the near future.