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Abstract Submission Form

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Preferred presentation Poster

Preferred session Session 8: Global challenges in measuring methane in ruminants

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Title of your paper The Swiss way of breeding dairy cattle for reduced methane: CH4COW

Insert ABSTRACT text

In Switzerland, 14.3% of greenhouse gas emissions come from agriculture. Although this is not much compared to transport, for example, agriculture is under political pressure from society to reduce its emissions. Agriculture is responsible for 83.3% of methane emissions in our country. Livestock, especially dairy cows, are a major contributor. However, in order to meet the target of a 50% reduction in greenhouse gas emissions by 2030 compared to 1990 and CO2 neutrality by 2050, action is needed at all levels. Besides farm and management level, the dairy industry has powerful tools at the cow level. Feeding measures can be very effective and have an immediate impact. Breeding actions have a medium to long-term aspect, but if implemented in the right selection strategy they are sustainable. For this reason, the umbrella organization of all Swiss cattle breeding organizations decided to launch a phenotyping offensive with the aim of implementing a routine genetic evaluation for methane emission based at least in part on Swiss phenotypes.

The reasons for having our own phenotypes are the following. (1) Our feeding systems are often different from the rest of the world; we have distinctly different summer and winter diets and in general our diets are very emphasized on roughage. (2) Not all farmers use total mixed rations, and some are not allowed to feed silage due to specific regulations for certain cheese manufacturing processes. (3) Animal welfare regulations and programs require regular outdoor access or even grazing in some cases. (4) Swiss milk production is not only based on Holstein (HOL) breeds: An important part comes from Brown Swiss

(BSW) or certain local breeds such as Simmental or Original Braunvieh.

Our initial project "CH4COW" started this year in January and will last for 4 years. We are working on installing sniffers on 60 farms across the country. Half of them are HOL herds, and the other half are BSW herds. The project is funded by the Swiss Federal Office of Agriculture, some regional governments, foundations and the Association of Swiss Cattle Breeders. Ten of the HOL farms are not allowed to have automatic milking systems due to regulations for certain cheese manufacturing processes, mainly Gruyère AOP. The sniffers will be installed in automated feeding stations in parallel with the installation of an animal identification system.

The start of this project is a first step towards the reduction of methane emissions from dairy cattle in Switzerland through breeding. Several options for the next step will be available and need to be validated. In the short term, we will be able to contribute our methane phenotypes to an extension of existing methane phenotype predictions using mid-infrared spectroscopy milk data, or to develop our own prediction. After that, we should be able to perform genomic evaluation for routine purposes. In the medium or long term, based on the experience gained, we could extend the sniffer phenotyping process to perform a genomic evaluation with real measured phenotypes.

The future pool of data and knowledge could form the basis for further collaborations. Not only in breeding, but also in related disciplines such as ruminant nutrition or life cycle assessment.

Enter keywords methane mitigation, dairy cattle, phenotyping, sniffer, genetics, breeding