



UNIVERSITÀ
CATTOLICA
del Sacro Cuore

Piacenza, 3rd November 2014

To:

COST - European cooperation in science and technology.

COST Action FA1302 - "Methagene – Large-scale methane measurements on individual ruminants for genetic evaluations".

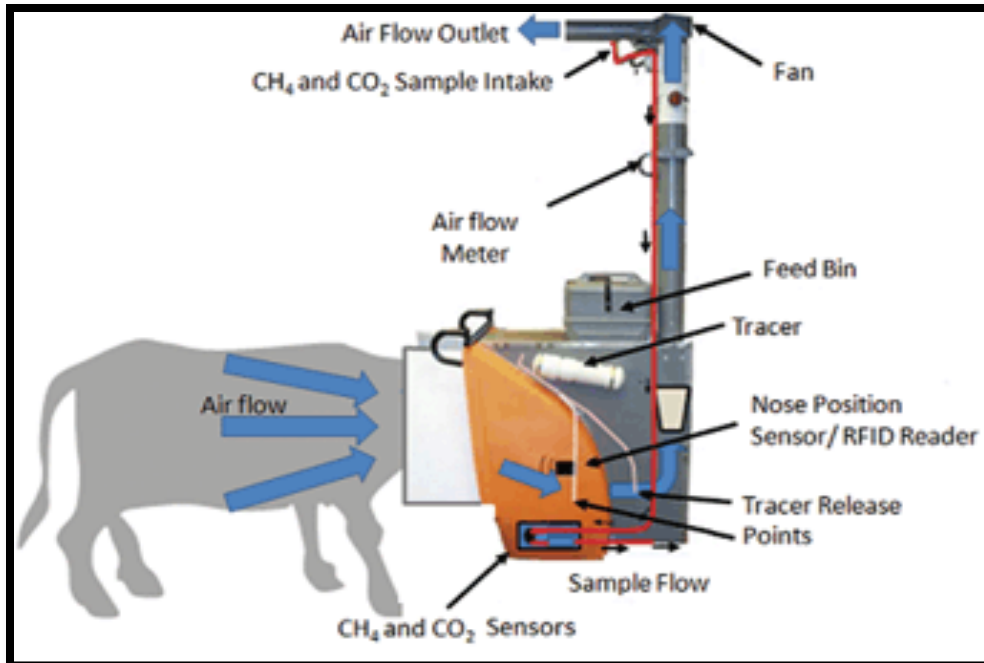
Subject: Short Scientific Report for STSM

Length of visit: 6/10/2014 – 20/10/2014 (two weeks)

First of all, I would like to say that the opportunity given me by METHAGENE was really important because I met people involved in METHAGENE that are also involved in the RuminOmics project. We shared information and practical operations of our national projects on the methane emissions measurements on a large number of dairy cows.

The purpose of the Short-Term Scientific Missions (STSM) has been to learn about a recent technique to measure methane emissions from dairy cows during milking. Methane emissions can be measured with different techniques, resulting in different choices between countries and research institutions. Depending also on the practical conditions, one method may be more advisable than another, but it is important to have the possibilities to directly compare the results obtained by different technologies.

The Institute of Zootechnique of the Università Cattolica del Sacro Cuore of Piacenza where I work is measuring methane emissions from dairy cows using the GreenFeed technology and 400 cows will be monitored by March 2015.



At the University of Nottingham, prof. Garnsworthy is performing, within the same research project, similar measurements but using a different technology. They install a gas analyzer in the automatic milking system (Lely) at the University of Nottingham farm. The picture shows the apparatus that have two analyzers, one for methane measurements (left) and one for carbon dioxide (right).



At our institute in Italy, we plan to use the same gas analyzer, too. This may allow a comparison between the two technologies, that will be of great interest as it is one of the major aims of the METHAGENE COST Action.

The work that I carried out at the University of Nottingham, under the supervision of prof. Garnsworthy's team, was to learn and to approach the practical conditions of the method for methane measurements. In the first week I had several conversations with people working in Animal Science Division, explaining and showing the procedure of using the gas analyzer technique to measure methane emissions.

In the second week, I visited their farm where the gas analyzer is installed in the automatic milking system. This practical experience allow me to become more confident with many practical aspect of the use of the "sniffer". This will be very useful when, as foreseen, one unit will be purchased by The Institute of Zootechnics to be used in Italy also in parallel with the two GreenFeed units that we already have. After the initial introduction (first week) and work on the field, I concluded my training activity looking at the data processing step, that is a crucial aspect of the Nottingham's technique.

During the two weekd visit, I had also the opportunity to participate to other activities carried out at the University of Nottingham and important to evaluate the efficiency of dairy productions with regards to the emissions of GHGs. I took part of rumen, blood and fecal sampling.

Furthermore, I worked in the Lab on the analysis of n-alkanes (used as markers to estimate the dry matter intake of cattle) and of milk fatty acids (which are candidates as proxies of methane

production). In addition, my institute and the Animal Science Division of the University of Nottingham have exchanged fecal samples to investigate and also to improve each other the analytical technique for alkanes.

At the end, I have written a short report to introduce and explain the “sniffer” technique to my institute, having some information about the instruments and the company provides them. The main results that came out from this period of the exchange was the acquirement of skills needed to transfer the method used by the University of Nottingham to Po Valley (North of Italy) conditions of farming, and to compare it with the GreenFeed technique that is installed in commercial farms in Italy, and how to manage and elaborate the data.

In the near future it is planned, as already mentioned, that one or two units of the “sniffer” used at Nottingham will be bought by our Institute of Zootechnics of Piacenza and used either in our experimental farm either in commercial farms to perform a comparative estimation of the Nottingham technique with the GreenFeeds as tools to evaluate emissions from a large number of animals raised in commercial farms. In this regard, the experience that I got during my STSM at Nottingham will be of crucial importance to be able to correctly and independently use the Nottingham system and obtain results that have to be reliable and comparable with that obtained by our English colleagues. Though we think that it is important to be able to perform by ourselves the measurements of emissions by the “sniffer”, the comparison between the two different systems of methane emission evaluation will be carried out improving the collaboration with the Animal Science Division of the University of Nottingham as an activity carried out within the METHAGEN COST action. We expect to take advantage from the large experience of the English colleagues to adapt at best their technique to the different situations that are present in the dairy farms of the Po Valley that is the main dairy area of Italy. Both techniques (GreenFeed and “Nottingham sniffer”) have some advantages and some disadvantages. To effectively measure GHG emissions from large number of dairy cows many other aspects, apart the reliability of their measurements, seem important to me and in particular the practical feasibility of such a monitoring activity that have to be carried out under different farm conditions, requiring a technique that have also to be also robust and flexible.

Your sincerely,

Vincenzo Lopreiato

A handwritten signature in black ink, appearing to read 'Vincenzo Lopreiato', written in a cursive style.