LAMENESS IN RUMINANTS

Mobility, wellbeing and... planet conservation

16-20 SEPTEMBER 2024, VENICE (I)

22nd International Symposium and
14th International Conference on Lameness in Ruminants

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WELCOME ADDRESS

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Dear colleagues and dear friends,

24 years after Parma 2000, the International Symposium and International Conference on Lameness in Ruminants (respectively the 22nd and 14th) returns to Italy. We are extremely grateful that in Tokyo friends and colleagues enthusiastically welcomed the Italian candidacy. Venice was chosen for various reasons, first of all for its atmosphere of mystery and magic which will make your stay pleasant and interesting.

Venice is the second tourist destination by number of visitors in Italy, after Rome, and has kept its structure and charm almost intact over the centuries. Built on more than 100 small islands, it is protected within a lagoon in the Adriatic Sea; there are no roads, but myriads of small and large canals lined with historic buildings and houses. It is possible to walk around its narrow streets or navigate its canals with the vaporetto or a *gondola.*

Capital of the Veneto region, it is only 15 minutes from a vast agricultural area having animal husbandry well developed, with dairy cows and fattening cattle farms. In the surrounding areas, close to the Alps, in addition to the Holstein Friesian, other breeds are also traditionally bred such as the Pezzata Rossa Friulana, the Grigio Alpina and the Brown Swiss which, with their quality milk, contribute to the varied production of cheeses typical of Italy.

The central themes of the conference will be the improvement of ***"mobility"*** and ***animal welfare****, aspects closely connected to productivity and profitability.*

Promoting ***"planet conservation"*** *is the other issue, which has by now become pressing and with which we will deal often also in our sector. A theme which is currently a living matter. Climate changes, with the increase in average seasonal temperatures and the irregularity of rainfall, for example, create difficulties in the supply and quality of forage and can cause changes in the type of cultivation in certain areas; the need to improve cooling and comfort has become a necessity even in geographical areas where it had never been before (Northern Europe). Last but not least, the arduous and challenging problem of antimicrobial/antibiotic resistance, which is expected to cause a huge number of deaths in humans in the near future, due to untreatable infections: the most optimistic predictions are counting something as 450.000 deaths in Europe and about 10 million in the world, equal to the rate of deaths from cancer! Just to name a few examples of global importance which also strongly affect animal breeding and care.*

In the latter case, in particular, the tools at our disposal to fight the soft tissue diseases of the foot or other conditions primarily or potentially infectious have been reduced, pushing, on the one hand, industry to search for alternative non-antibiotic products and, on the other side, the operators in the sector (vets, technicians, hoof trimmers, researchers...) to work more and better on the prevention of skin and subcutaneous tissues disorders and more.

There are several keynote lectures on very relevant topics such as cow comfort, hoof trimming, infectious diseases, therapeutic options environmentally friendly, new diagnostic tools (role of artificial intelligence against Digital Dermatitis) non-foot limb injuries and others... We will reserve a large space dedicated to free presentations and posters.

Furthermore, we have not overlooked a rich social program that will surely make your stay in the city of the Doges unforgettable.

On behalf of the Organizing Committee, we express our sincere gratitude for your attendance to the "International Symposium and International Conference on Lameness in Ruminants 2024" and we hope you can enjoy both the Conference and the city.

Warm regards,

Carlo Maria Mortellaro, Loris De Vecchis e Matteo Gianesella

Chairs of the Scientific and Organizing Committees

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SIVAR B

THE RELATIONSHIP BETWEEN THE HOOF HEALTH AND ENTERIC METHANE EMISSIONS IN DAIRY COWS

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Introduction and Objectives

Methane (CH4) is the main greenhouse gas (GHG) emitted by dairy cows, which is mainly (90%) produced during the fermentation process in the rumen. The excessive accumulation of GHGs in the earth's atmosphere from anthropogenic sources is responsible for the global warming. Various dairy cattle diseases, including hoof disease associated with lameness, are known to cause reduced milk yield and economic losses. However, many diseases are also connected with increase in enteric CH4 emissions. Thus, in addition to the economic losses for farmers, there is also a loss for planet Earth in combating climate change. Since lameness has been found to affect rumination behavior, reduce feed intake and increase rumen retention time, which affects the fermentation process, we hypothesized that lameness may also affect CH4 emissions in dairy cows. Therefore, this study aimed to investigate the influence of hoof health on enteric CH4 emissions, and the relationship among enteric CH4 emissions and foot surface temperature (FST) in dairy cows.

Material and Methods

Twenty-four Holstein-Friesian cows were divided into three groups according to the degree of lameness, which was assessed by the expression of pain and the ability to lean on the limb: NL (no lameness; n=6), ML (moderate lameness; n=9) and PL (severe lameness; n=9). Enteric CH4 emissions were measured with a laser detector for 4 minutes on two consecutive days (2-4 hours and 6-8 hours after morning feeding). FST was measured in the coronary band and surrounding skin of the hind feet, as region of interest, using infrared thermal imaging, and the maximum temperature was used for further analysis. Milk yield data were collected for each cow for the last month of lactation to estimate CH4 intensity (CH4 emissions/milk yield; ppm/kg). The significance of differences in all observed parameters was assessed between the examined groups of cows using independent samples t-test, while the Pearson correlation test was used to estimate the relationship between CH4 emissions and FST.

Results

The results shown no significant difference in enteric CH4 emissions between the examined groups of cows. ML group had the highest enteric CH4 intensity, which was significantly higher only compared to NL group of cows (p=0.04). ML group had also the highest FST compared to both NL (p=0.03) and PH (p=0.002) groups. A statistically significant positive correlation (r=0.645; p=0.001) was found between CH4 emissions and FST in examined cows.

Conclusions

The highest enteric CH4 intensity and FST were recorded in cows with moderate lameness, indicating the importance of early diagnosis and treatment of hoof disease both from the aspect of animal productivity and welfare, but also from the aspect of reducing CH4 emissions and environmental protection.

Keywords: enteric methane, dairy cows, lameness, environment

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