



C-MASC Graduate Student Viewpoint

FROM THE DESK OF ANNA KOLGANOVA

The issue of climate change has become one of the greatest problems of humanity. The agricultural sector is one of the main economic branches primarily responsible for actively changing climatic conditions, due to the fact it accounts about 25.5% of total global anthropogenic emissions. About 18% of these emissions are accounted only by livestock. Animal husbandry produces multiple kinds of greenhouse gases, including methane. The methanogenesis process in ruminants serves as a prevailing mechanism of methane production and its emission from livestock. Methane is produced as a byproduct of digestion during the process of enteric fermentation in ruminants' organisms. Therefore, enteric fermentation is considered a primary source of methane production in cattle. This is why it is important to study ways of enteric meth-

ane emissions reduction from ruminants, and this is exactly what I am going to do during my work in the scope of C-MASC. Under Dr. Lal's mentorship and with the help of Dr. Lakritz, who represents the Veterinary Medical Center at the Ohio State University, I am planning on studying the usage of heavy metals as a tool for enteric methane emissions reduction from ruminants. This paper will identify the role of heavy metals in the methanogenesis process. The hypothesis of this work is based on the assumption that heavy metals serve as inhibitors of the methanogenesis process in ruminants. If the hypothesis will be proven, then, we can provide a model of methane emission reduction by using heavy metals as inhibitors and this will be the main result of the paper. We can offer to use optimal doses of heavy metals as ruminants forage supplements. This would also be an exciting discover since usually, science talks only about heavy metals' negative impact on living organisms.

One of the main goals of C-MASC is to provide comprehensive research on carbon management and sequestration in the field of the agricultural industry. It requires a detailed study of the system "soil – plant – animal" components in order to find out the mechanism of carbon generation, transformation, and transmission on each of these stages. On the basis of such studies, it will become easier to find the main levers of carbon management and ways to prevent greenhouse gases emissions from this system.

As a representative of the Ohio State University and C-MASC, I am planning on taking part in different scientific conferences about soils in the upcoming semester. Dr. Lal and I are currently working on the article for the XXV Dokuchaev Conference «Soil is life», which is going to be in St. Petersburg, Russia at the beginning of March. I am also developing a paper for the international scientific ecological conference "Environmental protection is the basis of the country's security", which will be organized in Krasnodar, Russia in April 2022.

I am grateful to C-MASC and Dr. Lal for providing a plethora of opportunities for my self – development and for supporting me throughout my scientific path.

Sincerely,

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