**Future Perspectives of Balancing Food Security and Environmental Impacts**

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**Abstract**

Ruminants produce edible products and contribute to food security. They house a complex rumen microbial community that enables the host to digest their plant feed through microbial-mediated fermentation. However, the rumen microbiome is also responsible for the production of one of the most potent greenhouse gases, methane, and contributes about 18% of its total anthropogenic emissions. Our research is focusing on how to modulate and balance the complex microbial community residing in ruminants’ guts to increase food security while decreasing environmental impact. In my talk I will discuss some of our recent findings regarding this ecosystem's development, interaction with the host potential ways to modulate it.