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Utilization of Biochar as a Methane Management Strategy in Cattle

Abstract.

Biochar has been proposed as a carbon neutral or even carbon negative technology that can be used to capture carbon stocks in stable, long term storage. Limited research has also demonstrated that feeding biochar to ruminant animals can reduce enteric methane emissions, further reducing the carbon footprint of food production from ruminant animals (meat and milk). While biochar is not currently FDA approved to be fed to food producing animals, we have acquired a waiver that allows for feeding biochar to cattle in controlled research trials. Monensin is an FDA approved feed additive that is commonly fed to both forage (grazing and pen conditions) and feedlot cattle. In past research monensin has had variable impacts on methane emissions and benefits have been shown to be transitory. The goal of this project is to evaluate the interaction between monensin and biochar in cattle diets. Objectives include measuring cattle performance including feed intake, body weight gain, and feed efficiency, as well as measuring methane emissions from pens of cattle (8 animals per pen). Because the mechanism by which biochar may reduce methane emissions is not clear, and we can only study 2 treatments per trial in our methane chambers, we are proposing 2 trials. The first finishing trial would not include monensin in the base diet. If year 2 funding is secured a follow up finishing trial would be conducted with monensin in all diets. For each finishing trial carcass characteristics including carcass weight, ribeye area, and 12th rib backfat would also be measured. Data backed information is needed by the beef industry to determine if feeding biochar and monensin, together or separately, is beneficial in reducing methane emissions from cattle, and if there are other impacts on cattle performance. Costs will cover technical support, graduate student assistantships, and feed ingredient analysis.