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Environmental Responses to Dietary Monensin in Lactating Dairy Cows

Scott W. Hamilton and Frank M. Mitloehner
Department of Animal Science, University of California, Davis, Davis, CA, 95616

Species: Dairy

Use Area: Animal Housing

Technology Category: Diet Modification

Air Mitigated Pollutants: Methane, Nitrous
Oxide, Carbon Dioxide, Methanol, Ethanol

Point of Contact:

Frank Mitloehner, PhD.
University of California, Davis
Dept. of Animal Science, Meyer Hall,
One Shields Avenue
Davis, CA 95616
USA
(530) 752-3936
fmmitloehner@ucdavis.edu

System Summary:

Paramount amongst the problems currently facing the dairy industry is the impact the dairy industry has on the environment. A main environmental concern associated with the dairy industry is the emission of volatile organic compounds (VOC) and greenhouse gases (GHG). Feed additives, like monensin sodium (monensin), have been thought to improve cattle health and productivity, and have been used for these reasons for decades. Feeding monensin to dairy cattle has the potential to change CH₄ production by altering bacteria populations in the rumen. Improvements in feed efficiencies for rate of weight gain and milk production equate to reductions of emissions per production unit. The use of ionophores has been shown to improve efficiency in the animal, although with inconsistent results.

Applicability and Mitigating Mechanism:

- Monensin is currently approved by the FDA
- Can improve feed efficiency, and increase milk production efficiency equating in less emissions per production unit
- Feed additive that can alter rumen environment potentially changing end products of fermentation
- Efficiencies have been reported, but with inconsistencies

Limitations:

- Use limited to minimum and maximum feeding levels set by FDA
- Results are inconsistent
- Type of diet might not favor use of monensin
- Off-label use is prohibited
- Very high levels can result in toxicity in animal

Cost:

Monensin is most commonly delivered to the animal in a mineral or grain premix. Depending on the type of premix, inclusion level of monensin, and cost of transportation, costs can vary widely. Depending on the method of delivery to the animal, the cost of the raw drug form of monensin (Rumensin® R80, 80 g lb⁻¹) can range from approximately \$0.0145 to \$0.072 cow⁻¹ day⁻¹, delivering 185 to 660 mg head⁻¹ day⁻¹, respectively.