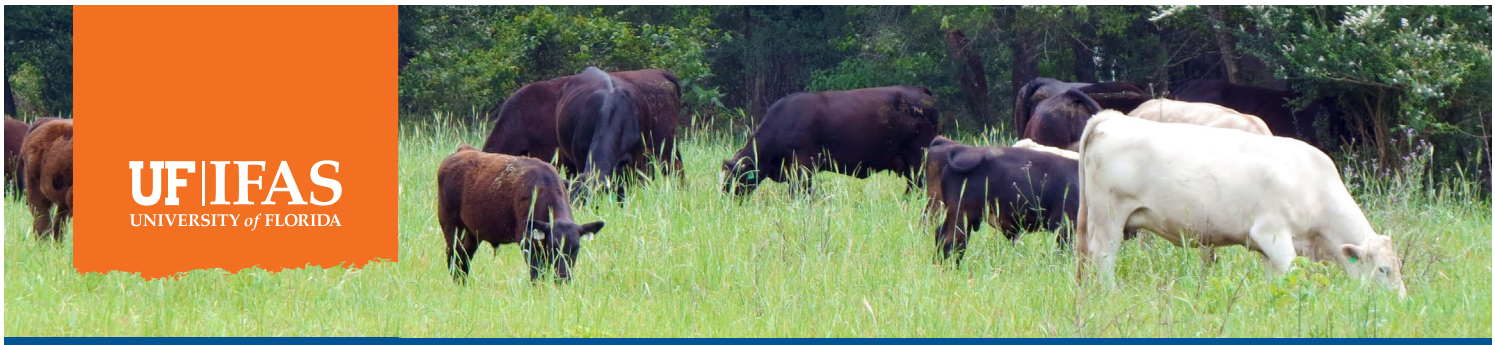


UF/IFAS North Florida Research and Education Center (NFREC) Nutrition Lab

Nutritional Strategies to Mitigate Enteric Methane Emissions from Beef Cattle

Methane (CH_4) is a key compound in the global carbon cycle, and is the second most important greenhouse gas (GHG) implicated in global warming.

Enteric methane is produced in the rumen and hindgut of animals by methanogens, a subgroup of the domain *Archaea* that can produce methane as a result of feed digestion.

Methanogenesis is an essential process but it is a waste of fed energy for the animal. The energy loss in ruminants is between 2 and 12 %.

Enteric methane output can be reported as:

Daily methane output
(CH_4 g/d)

Methane yield
(CH_4 g/kg of DMI)

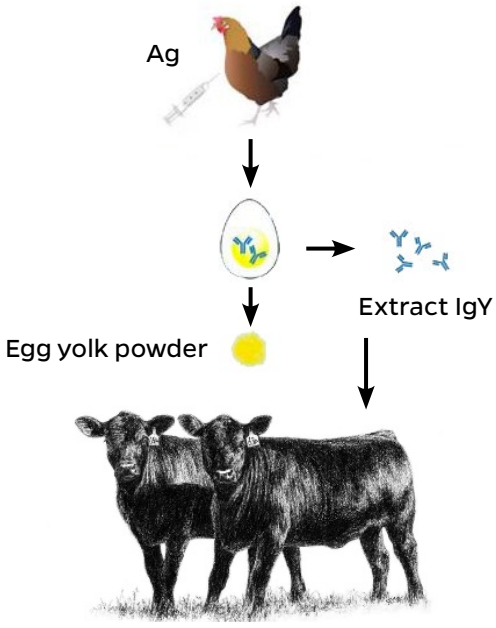
Methane emission intensity
(CH_4 g/kg of carcass weight or CH_4/kg of milk produced)

Feed supplementation in steers fitted with equipment to measure enteric methane emissions using the SF_6 tracer technique, UF/IFAS NFREC. Photo Credit: Dr. Mariana Garcia-Ascolani.

Feeding strategies that have shown promising results:

- Some of the most common methanogens in the rumen are: *Methanobrevibacter gottschalkii* Ho and *M. rumminantium* M1. Combined, these two organisms represent 74% of ruminal methanogenic archaea. Feeding strategies that reduce populations of these methanogens in cattle are showing promising results. When eggs from chickens immunized against these two methanogens were fed to cattle, an 11% reduction in enteric methane was observed.

Passive immunization by hyperimmune egg yolk IgY



- Replacing urea, a common non-protein nitrogen source fed to cattle, with calcium ammonium nitrate, also showed a reduction of 11% in enteric methane emissions in vivo.