

**NE-1544 Minutes**  
**Cincinnati, OH**  
**June 23, 2019**

**Members in Attendance:** Joe Harrison, Al Rotz, Rhonda Miller, Breno Fragomeni

**Administrative Update (Steve Smith):**

- IDEAS program may be a good fit for our committee.
- Several foundational programs are preparing for the upcoming NIFA move by having the same RFA for two years. RFA will list two deadlines. Need to be careful not to pull down the application package until after Jan 1, 2020 – or it may be too early and the wrong program codes will be on the files internally.
- Day after announcement on the NIFA move, every employee received a directive relocation letter. Out of 300 employees, all but 20 will be relocated. 20 employees may stay in national region (director, and top administrative staff). Six NPLs will be allowed to stay, but will not be running programs anymore.

**State Reports:**

*Breno Fragomeni, Ph.D., University of Connecticut*

Examining the Genotype X Environment Interaction in a rank comparison of bulls from California and New England

National data:

- Corrects by herd year season
- Does not consider GxE interaction
- Bull with many cows in CA may be ranked #1, but may not be best bull for CT
- Examining if bull rankings change if one considers the environment

Sire evaluation -- separated by state:

- Genetic correlation
- Bull ranking

Lactation curve:

- Theoretical vs realized
- Genetic components of curves across states

Genome-wide association study

Investigating the genetic makeup in different production systems

- Environment or Management
- Identification of markers

Pilot Study:

Gene expression in heat stressed cows

Single cell RNA seq in milk samples

- Does it change when cows are heat stressed?
- Does it change with breed?

- Does it change with production system?

Establish a baseline with SAES Jersey and Holstein cows and compare differences in the future.

Al Rotz, USDA-ARS – The Pasture Systems and Watershed Management Research Laboratory

USDA-NIFA funded project – SUSTAINABLE DAIRY – CAP grant funded out of Wisconsin.

15+ universities and other institutions, 35+ researchers.

5 major objectives

- Measurement
- Modeling
- Life cycle assessment
- Extension/outreach
- Education

Simulated baseline farms in Wisconsin and New York

Carbon Foot print model

- Ignores potential for carbon sequestration in this model.
- Interaction with changing climate

Comprehensive assessment looks at New York, Pennsylvania, and Wisconsin

Simulate with and without BMPs

- BMPs benefit farm under current environment, and as predicted with climate change
- Reactive N footprint – some increases in N loss with BMPs
- Main drivers are increased precipitation and intensity
- Harder to prevent P loss with climate change
- Without mitigation measures, the environmental impact of dairy systems will increase
- Adoption of farm-specific BMPs will help mitigate effect

Another project – Sustainability of US Beef was initiated by the National Cattlemen’s Beef Association. Quantifying environmental impacts of beef cows by region – southwest, northwest, north plains, south plains, midwest, northeast, southeast

GHG emissions from beef cattle relatively low contributor to long term global warming

- Beef account for 3.3% of US GHG emissions (CO<sub>2</sub> equivalent)
- Beef account for 15% of annual atmospheric emissions for NH<sub>3</sub>, N<sub>2</sub>O and NO<sub>x</sub> in the US. Includes dairy cull animals coming through beef cycle.
- Reactive N losses are a concern
- Water consumption is the major concern – particularly western regions

Joe Harrison, Washington State University

Comparison of Sulfuric vs Oxalic Sulfuric when forming struvite from liquid dairy manure

Joe and Keith Bowers (Multiform Harvest)

A mobile struvite unit has been taken to 30 dairies to see how manure from different farms affects the efficiency of capture. It is somewhat expensive to move two 5,000 gallon tanks (~\$800), have gone to trucking manure from dairies close by.

#### Pure Struvite NPK + Mg (6-29-0 + 10)

- Slow release rate for P
- Can be placed directly by seed with no burning
- Water solubility good, but not prone to leaching
- Struvite crystallization removes excess P from livestock wastewater
- Fluidized bed with cone shape
- Lower pH with sulfuric acid (oxalic acid doesn't seem to work as well)
- Boost pH with ammonia or caustic soda -- ammonia water seems to work better
- Mg Boost with Magnesium chloride or MgO plus carbon dioxide
- With low Calcium manure such as swine, pH reduction is not necessary
- With raw manure capture 50% of P; anaerobically digested manure capture 80-90% of P
- If the NH<sub>3</sub> concentration is too low, it reduces P capture
- Want Fe as low as possible, as each mg Fe/L binds 0.5 mg/L OrthoPhosphate
- With raw manure, use of oxalic acid not beneficial unless can separate out calcium-oxalate
- Costs \$0.35-\$0.75/day/cow. Struvite production not going to make you money, but is a technology that can help one remove P from manure and use it in a beneficial manner

Rhonda Miller, Utah State University

#### Nitrogen Cycling in Response to Grazing of Grass-Legume Mixtures versus Monocultures:

- Part of a larger study examining rates of gain, forage productivity, and reproductive rates
- Grass monocultures require use of nitrogen fertilizers which are expensive and tend to result in higher nitrogen leaching
- Grass-legume mixtures can reduce or eliminate the need for nitrogen fertilizer
- Birdsfoot trefoil was used in the grass-legume mixtures. Birdsfoot trefoil contains tannins, which have the potential to improve rates of gain and shift nitrogen from the urine to the feces
- Grasses examined included: tall fescue, meadow brome, orchardgrass, and a high carbohydrate perennial rye
- Rate of gain always higher on grass-legume paddocks
- Total N in feces and urea in urine higher under grass-legume mixtures
- Nitrate in leachate lower under grass-legume mixtures than grass monocultures

#### **Other Business:**

Next meeting location: Breno will host in Connecticut. Dates discussed. Breno will send out an email requesting a date.