

Summary: Nutrient Requirements of the Beef Female in Extensive Grazing Systems: Considerations for Revising the Beef NRC

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Background

- NRC Nutrient Requirements
 - Value for animal agriculture
 - Nutritional management – ration analysis and balancing
 - Value for animal science
 - Generates research questions

Background

- 1996 NRC huge step forward from 1984
 - 2 models
 - New intake predictions
 - MP system
 - Energy adjustments
 - etc.

Key Grazing Considerations

- Grazed forage resource is ever-changing in space and time
- Limited control and predictive power
- Restricted management options

Difficulty predicting forage intake by the grazing beef cow

- Relationship of intake with cow BW, BW change, milk production, calf performance indicate milk and/or calf performance are important drivers.
 - Limited data with milk production.
 - Can calf weaning weight sum the effects of cow size, growth potential, and milk production in an 'index'?
 - If so then cow efficiency could be calculated as the residual of cow size, BW change, and calf weaning weight (corrected to 205 d for consistency).
 - Does not account for calf grazing and the impact of forage nutritive value on calf growth.

How well does the current MP system work in grazing beef females?

- Issues to improve:
 - Energy prediction influence on DIP prediction
 - Recycled N
 - Changing MOEFF strongly influences MP balance, but does not influence performance prediction
 - Pasture effect causes overestimation
 - Need ability to better describe the situation the cow is in
 - e.g. energy balance influence on MP efficiency

How well does the current MP system work in grazing beef females?

- Conclusion & Recommendations
 - Address ruminal use of recycled N
 - Particularly to account for infrequent supplementation
 - Address fate of MP relative to energy balance
 - Influence on performance

Limitations in predicting energetic requirement of grazing beef females

- Does NRC accurately predict actual performance?
- Why are they different?
 - Influence of grazing vs. controlled environment
 - Influence of adaptation to environment on efficiency

Inferences about energetic predictions

- Generally
 - Best fits occur when:
 - Physiology, diet, environmental conditions have less variability
 - Poorest fits occur when:
 - Pregnant or lactating
 - Grazing native range
 - Negative energy balance

Overall Recommendations to NRC committee

1. Embrace interaction between protein and energy metabolism in the ruminant
 - In turn, consider how this drives intake
2. Consider interactions between rumen metabolism and animal metabolism
3. Embrace variability – don't over-focus on "tight" relationships based on highly controlled experimental situations
4. Don't be afraid of moderate r^2 values
 - e.g., explaining 40% of variation in intake is a lot

Recommendations for Researchers

- Collect baseline data
 - Weather
 - Herbage availability
 - Herbage quality
 - Diet quality
 - Digestibility (extent and rate)