

Designing Rations and Troubleshooting on Dairies

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Designing Rations

- Has to start with forage
 - Quality and availability

RFV
170

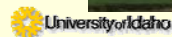


Quality of forage

- Harvested at correct maturity and moisture
- Packed well
- Sealed
- Good face management



Large Piles of Silage



Designing Rations

- Has to start with forage
 - Quality and availability
- Must understand the operations and limitations of the farm
 - Must feed certain feeds since they are grown by brother/cousin/etc. no matter the quality
- Add other ingredients to meet nutrient needs affordably



Troubleshooting Nutrition on Dairies

- Gather information from reliable sources
 - Milk yield & composition
 - Bulk tank
 - Pen averages
 - By DIM
 - By parity
 - History - Previous month, year
 - Any idea on dry matter intakes?
 - By pen, By DIM, overall



Troubleshooting Nutrition on Dairies

- Know feed ingredients
 - Nutrient analyses
- Who mixes diet
 - Type of mixer
- How often is feed offered
 - Bunk management
 - Pushed up
- Feed inventories



Troubleshooting Nutrition on Dairies

- 1) TMR
 - Particle size
- 2) Rumen fermentation
 - Feet and legs
 - Fecal screens
 - Milk fat %
- 3) Cows
 - Milk yield
 - Feet and legs
 - Locomotion scoring
 - Incidence of metabolic disorders
 - Milk fever, ketosis, DA
 - When do they occur?
 - Body condition score
 - Reproduction





Introduction

- On a **gross** scale, increasing crude protein content of diets:
 - Increases feed intake
 - Increases milk yield

 - May increase milk protein content

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Concerns

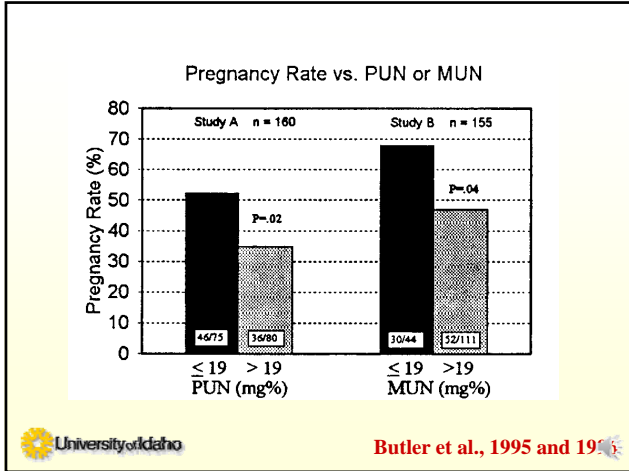
- **Inefficiency of nitrogen use**
 - Costly if excess protein is fed
 - Environmental issues
 - Cheese

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Concerns (con' t)

- **Inefficiency of nitrogen use**
 - Costly if excess protein is fed
 - Environmental issues
 - Cheese
 - **Poor reproductive performance**

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BUN and MUN suggested as a measure to evaluate efficiency of protein utilization

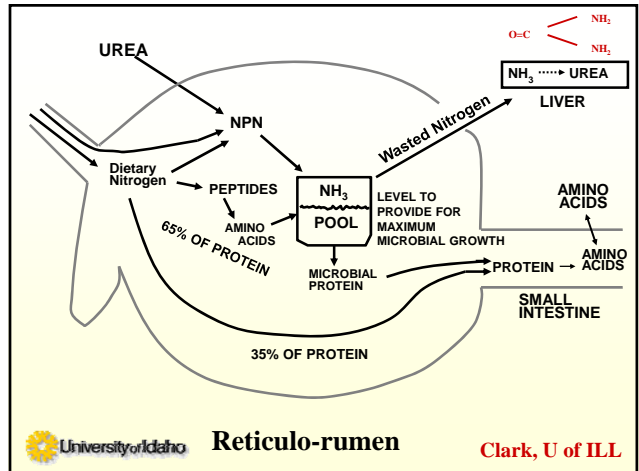
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Urea

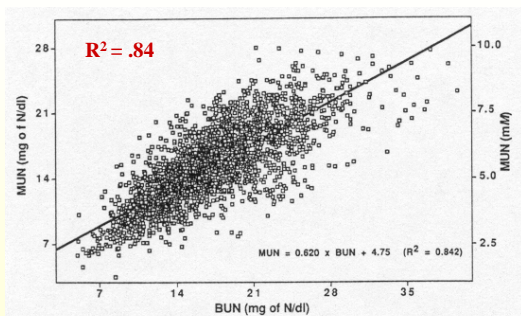
$$\begin{array}{c}
 \text{NH}_2 \\
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 \text{NH}_2
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- Excretory product of ammonia (NH₃)
 - Rumen
 - AA catabolism
- Formed in liver: urea cycle

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Summary of 35 trials



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Broderick and Clayton, 1997

MUN

- Easier to sample
- Pre- and post-milking strip samples not different than typical milk sample

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Gustafsson and Palmquist, 1993

Nutritional effects on MUN

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Quick summary

- MUN increased with increasing dietary protein
- Response confounded with carbohydrate availability
- RDP as a % of crude protein increased with increasing dietary CP

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Quick summary

- Excess RDP increases MUN
- Imbalance in protein supply contributes to increased MUN



Quick summary

- MUN is affected by level of dietary RUP
- Non-urea NPN is stable



MUN may be a useful tool, **BUT...**

- Problem could be from a variety of nutritional issues
 - Dietary protein source
 - RDP
 - RUP
 - Dietary carbohydrate
 - Rumen fermentation (i.e., energy)



Milk Urea Nitrogen (MUN)

- What does it tell you?
 - Low MUN (<12 mg/dl) suggests a very efficient use of amino acids
 - possibly limiting



Milk Urea Nitrogen (MUN)

- What does it tell you?
 - High MUN (>18 mg/dl) suggests a significant rate of amino acid oxidation
 - overfeeding of protein
 - imbalanced amino acid pattern
 - excess urea fed
 - low energy
 - inadequate carbon for the bacteria to capture the N as microbial protein



How to Use MUN

- Sampling
 - with normal herd testing (individual animals)
 - more repeated in a subset of each ration fed or pen of cows (10-15% of cows sampled)
 - Time of day
 - little variation unless significant slug feeding or significant sorting occurring



How to Use MUN

- Results only can suggest that protein nutrition is improper (could be either protein or energy effect)
- Only provides a clue; does not give the full answer
- You must investigate to determine if there is a problem

