Feed Management on PA Dairy Farms

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CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

Cost-Effective Strategies Needed

Chesapeake Bay Commission highlighted most likely sources of nutrient reductions at the lowest cost:

1. Wastewater treatment plant upgrades
2. **Diet and feed adjustments**
3. Traditional nutrient management
4. Enhanced nutrient management ("yield reserve")
5. Conservation Tillage
6. Cover crops

Cost-Effective Strategies for the Bay: 6 Smart Investments for Nutrient and Sediment Reduction, Chesapeake Bay Commission, December 2004.

Cost-effective reduction of manure impacts

"By far, the most cost-effective way to minimize the environmental impact of the large volumes of manure generated within the watershed is through adjusting feed formulation for poultry and livestock… Nitrogen reductions of 30–50 percent and phosphorus reductions of 40–60 percent are achievable using a variety of diet modification techniques for poultry, dairy, cattle and swine."

Cost-Effective Strategies for the Bay: 6 Smart Investments for Nutrient and Sediment Reduction, Chesapeake Bay Commission, December 2004.

Improved Feed Management: Better Profitability, Better Water Quality

- Improve feed efficiency by eliminating excess nutrients while maintaining or improving milk production.
- Farm reduced feed costs by 68 cents/cow/day, and increased milk fat and protein.

Matching nutrients in feed to cows' production requirements helps to:

- Manage feed more efficiently, so that more nutrients are used for milk production and fewer are wasted.
- Decrease excreted nutrients.
- Reduce nitrogen and phosphorus entering streams and rivers.

Huge opportunity for water quality improvement

- 25-35% of the nitrogen contained in feed is goes into milk, and the remaining 65-75% is excreted in feces and urine.
- Diets often have 120-160% of the phosphorus needed. Excess is excreted in manure.

PA Precision Dairy Feeding Project

- Direct technical assistance to 66 farms in collaboration with nutritionists
- Assistance to nutritionists and vets to assist 33 additional farms
  - Across Chesapeake Watershed in PA
  - Diverse management – large, small, grazing, confined, certified organic
- Feed and manure analysis, tracked production and reproductive health
- Maintained/improved production and reproduction

PA Trainings on Feed Management

- Technical details for 40 nutritionists and veterinarians on ration formulation
- “Dairy Tool” to assess bottlenecks to profitability, with feed component for 248 dairy industry professionals
- Certification for nutritionists to become USDA Technical Service providers
  - 65 now certified across Chesapeake Bay watershed
- Workshops for over 1,500 dairy producers

Some recommendations to dairies

- Maximize quality of forages
  - Reduce feed costs
  - Improve on-farm nutrient balance

Some recommendations to dairies

- Use routine forage and grain testing to determine nutrient content
- Reduce or remove inorganic phosphorus supplements from rations
- Group animals based on age and production to maintain efficiency of nutrient utilization through the production cycle
- Mix and deliver rations with minimal wastage
- Monitor performance and nutrient efficiency
  - Milk production and milk urea
  - Dry matter intakes/nutrient intakes
  - Manure (undigested grains, P)

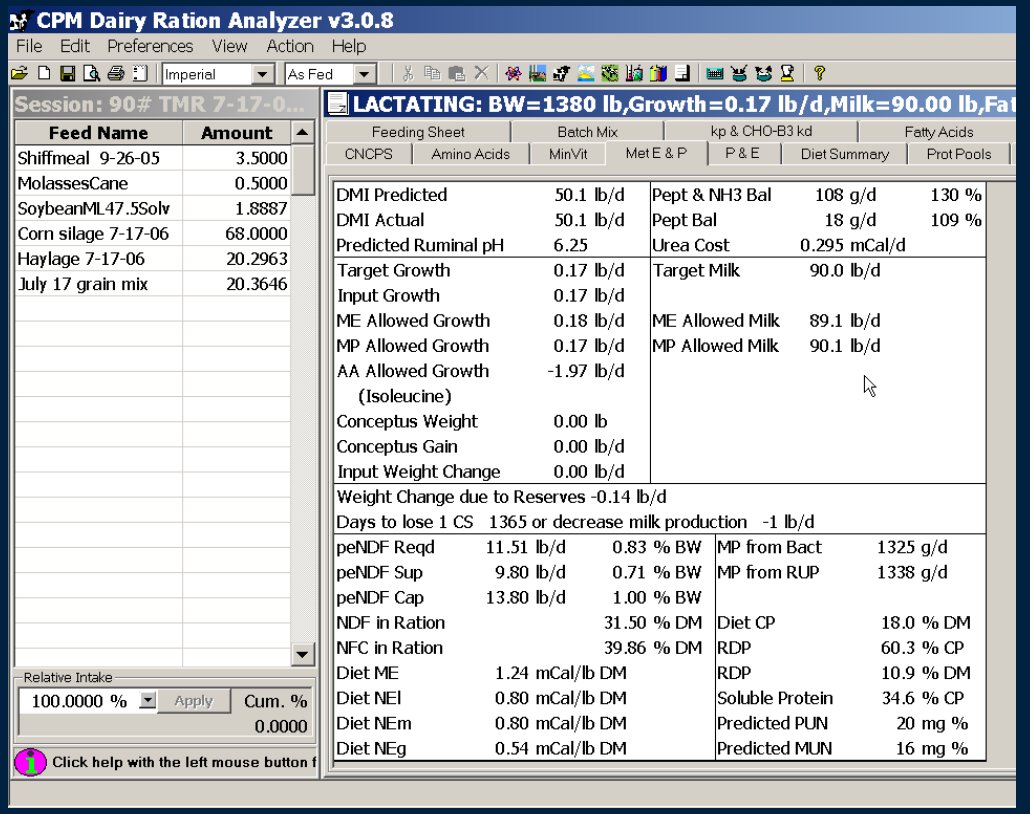
Some recommendations to dairies

- Use more highly digestible feeds, such as higher quality forages, more finely processed corn, or correctly roasted soybeans so that nutrients are used more efficiently

Improved corn silage processing increased machinery and labor costs, but increased profitability $9,000/ month on one farm

Some recommendations to dairies

- Use byproduct feeds with caution, due to variability and possibly high phosphorus levels
- Increase metabolizable protein, decrease crude protein

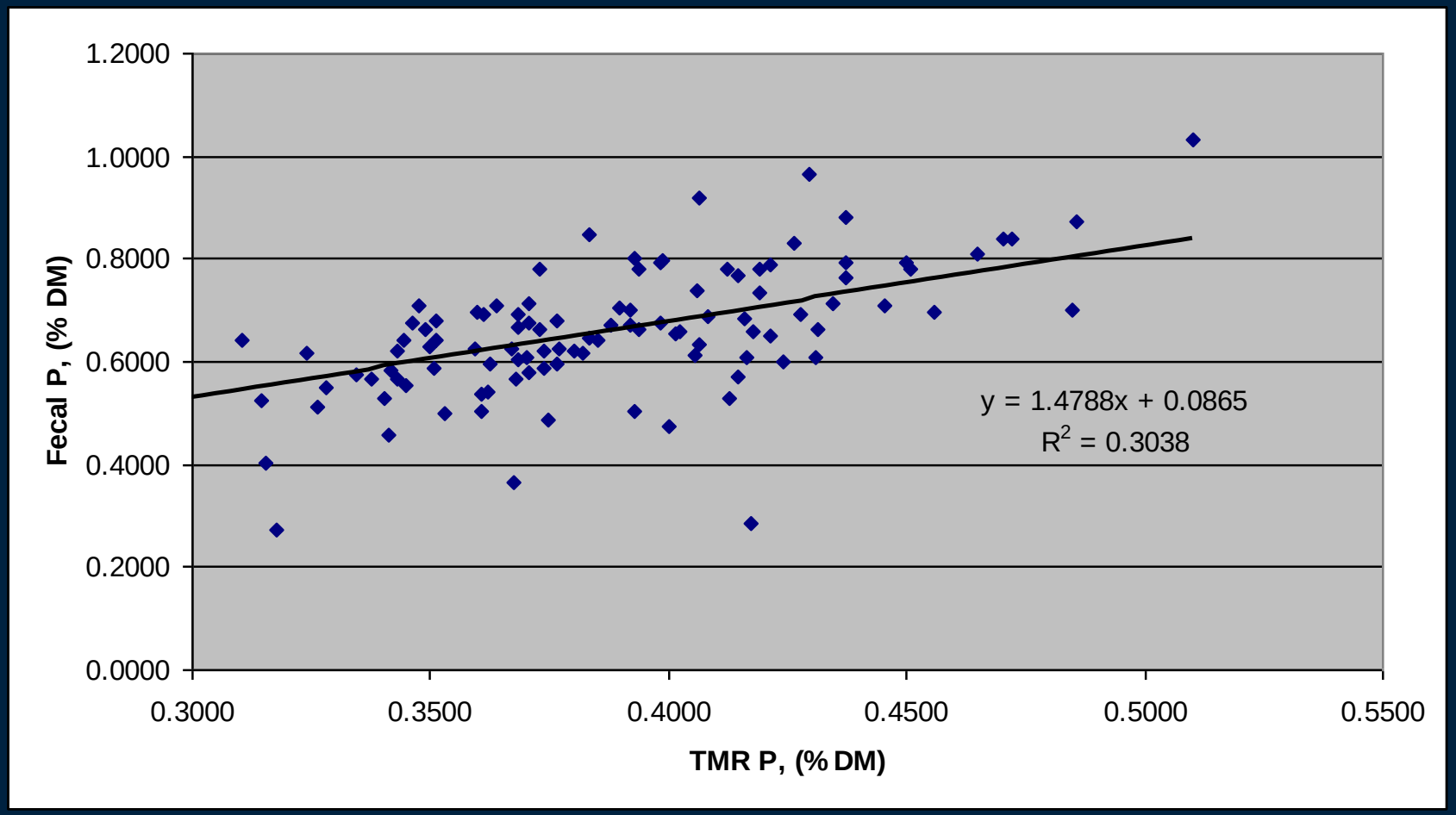


Herds with phosphorus levels below 0.40% had higher pregnancy rates than those fed more phosphorus

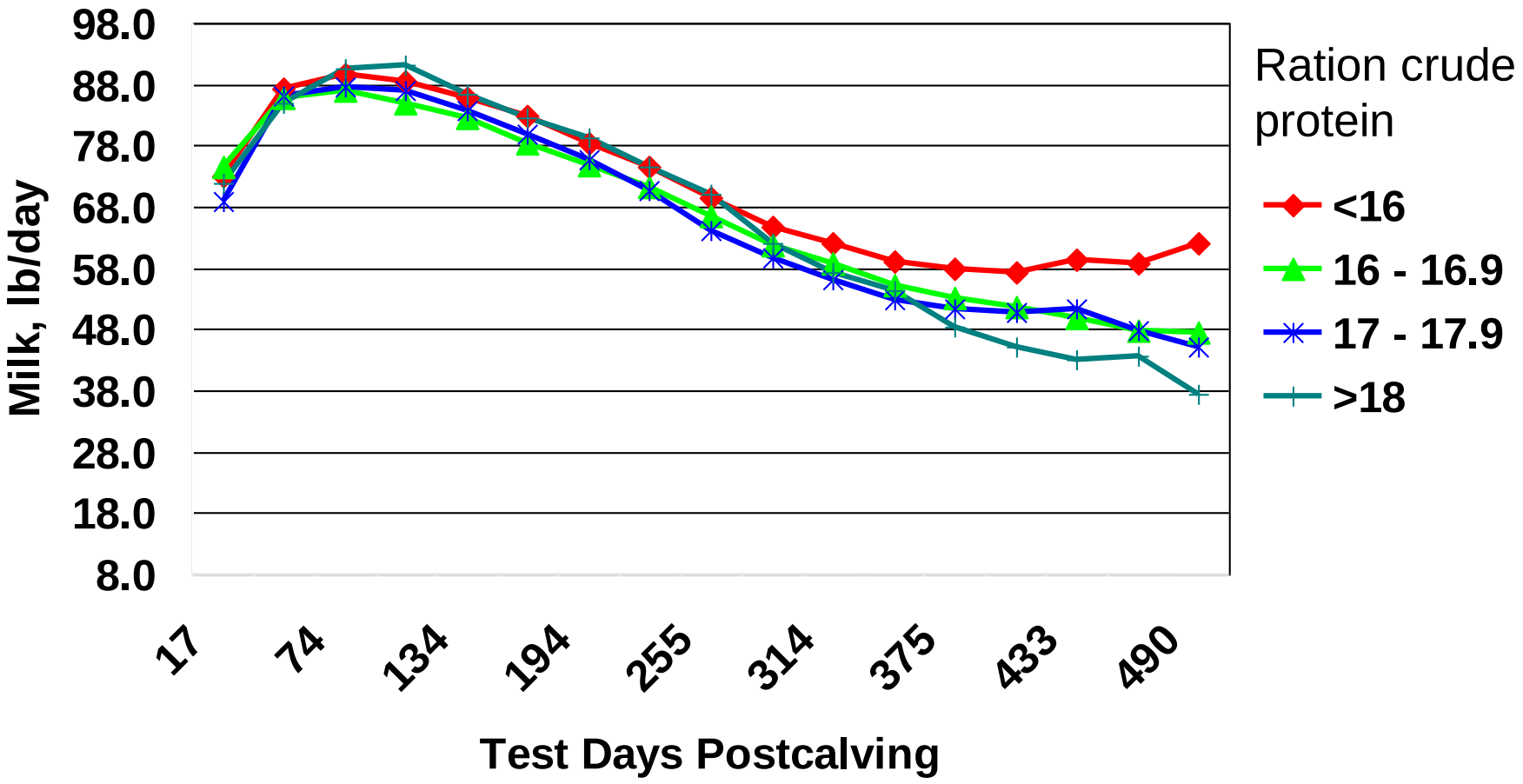
Ration's P content (dry matter basis)	Pregnancy rate
< 0.40%	21.5%
> 0.40%	19.3%

Removing excess dietary phosphorus did not cause problems with reproduction and production. Other management factors, not the reduced phosphorus, probably caused the improvements in the low P group’s reproduction.

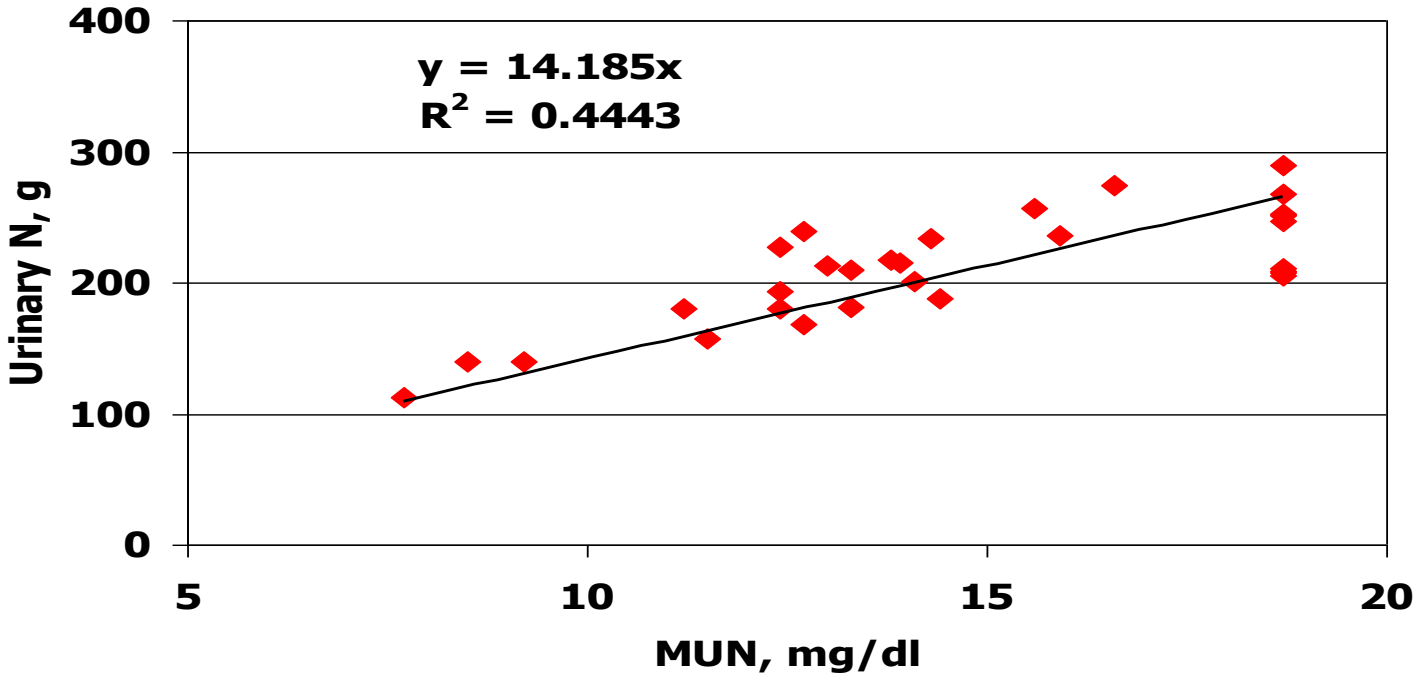
Dietary phosphorus plotted against fecal phosphorus (both % Dry Matter), with a mean dietary phosphorus of 0.39%.



Milk Production



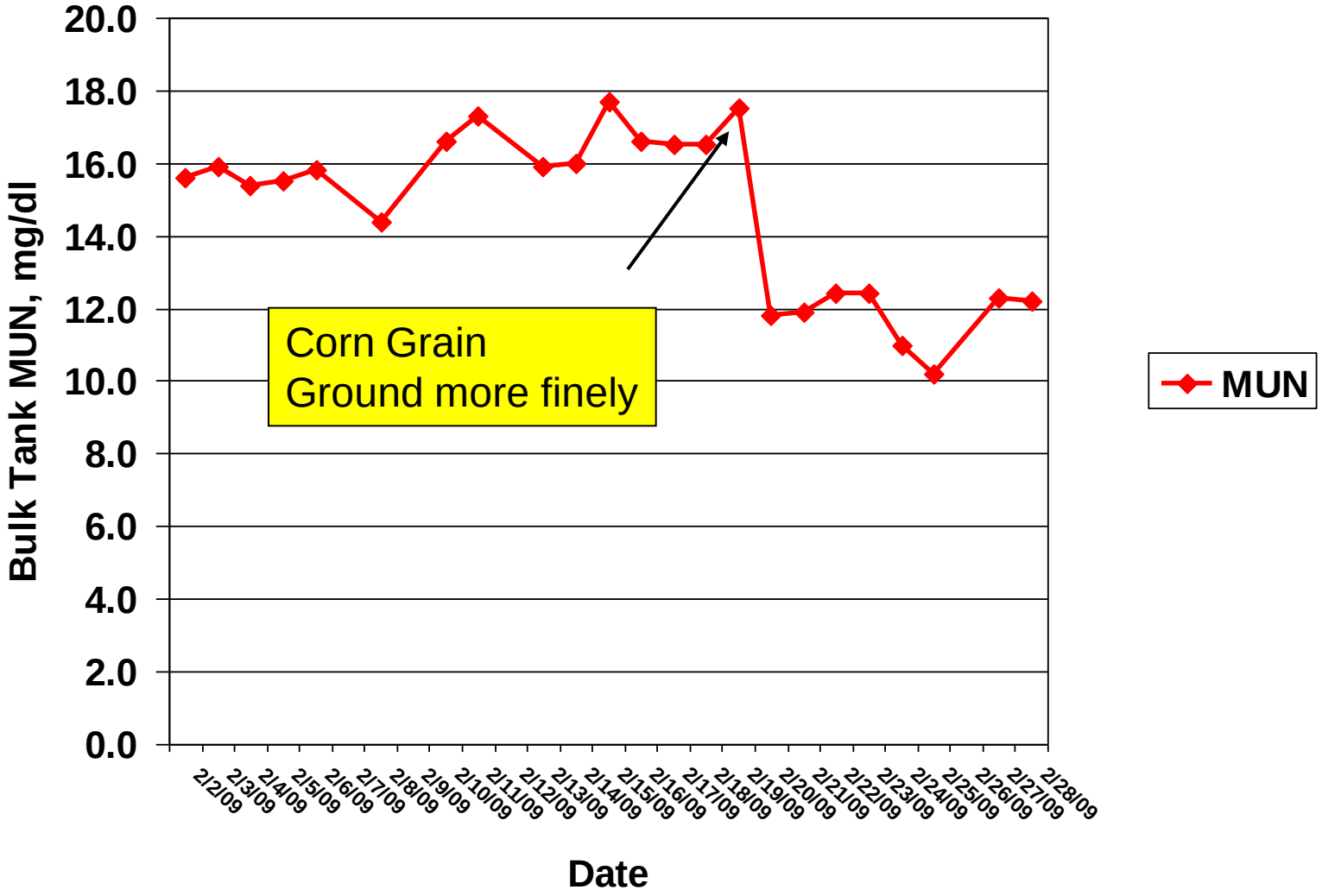
Milk Urea Nitrogen – Key Monitoring Tool
Urinary N and MUN



Monitor Milk Urea Nitrogen as a indicator of Urinary N

Broderick, Haig, Kebreab, Wattiaux, Sannes, Brito, Olmos Colmenero, Reynal St. Pierre 17.68*MUN prediction; Jonker 15*MUN

Simple change, significant production increase



Improved feed efficiency, lower protein

- Herds feeding diets with less than 16% crude protein produce the same amount of milk as herds with higher protein
- Lower crude protein results in less urinary nitrogen and lower ammonia emissions

Potential impacts

58.4 lb. nitrogen and 19.7 lb. phosphorus annual reductions in excretions for each cow

* Comparing herds with >18% and <16% crude protein, and those with >0.4% and <4% phosphorus

“We at Hoober Feeds have enrolled a number of our customers on a precision feeding program to improve farm profitability while benefiting the environment. They've reduced feed costs by anywhere from 5 to 15 cents per cow per day with no negative effects on milk or milk component production. We’ve also seen no negative effects on reproduction and, in fact, reproduction has actually improved in a number of these herds.”

Tom Nauman, Nutritionist

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Challenges to Improved Feed Management

- Farm Profitability – reluctance to change
- Farms with greatest challenges not seeking help
  - More successful farms already managing feeds well
- Inconsistent or poor quality forages
- Inexpensive feeds have higher P (distillers grains
- Limited farms signing up for EQIP feed management

2025?

- Better management of dairies – milk house waste, barnyards, improved feed efficiency
- Better forage management and nutrient cycling on farm, less imported feed
- Fewer cows producing more milk, smaller impact on water and air quality
- New ways to promote environmental stewardship – milk inspectors, lenders, local governments, insurance agents

Healthy Farms, Healthy Communities, Healthy Watersheds

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