

Nitrogen and phosphorus use status in small and medium sized dairy herds

Z. Dou, L. D. Baker, R. J. Munson, D. T. Galligan, J. D. Ferguson,
C. F. Ramberg, D. W. Remsburg, and Z. Wu

University of Pennsylvania, School of Veterinary Medicine
New Bolton Center, Kennett Square, PA

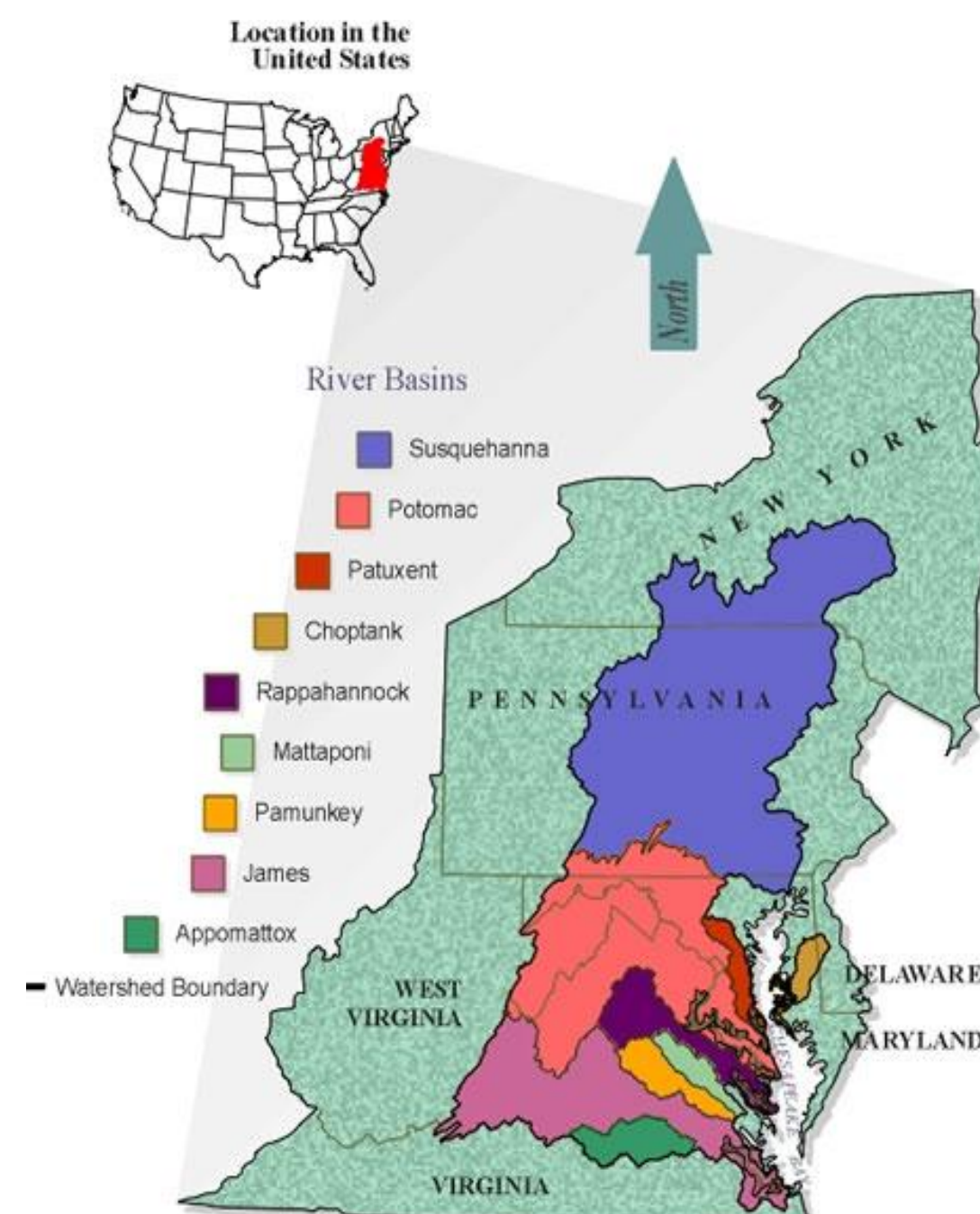
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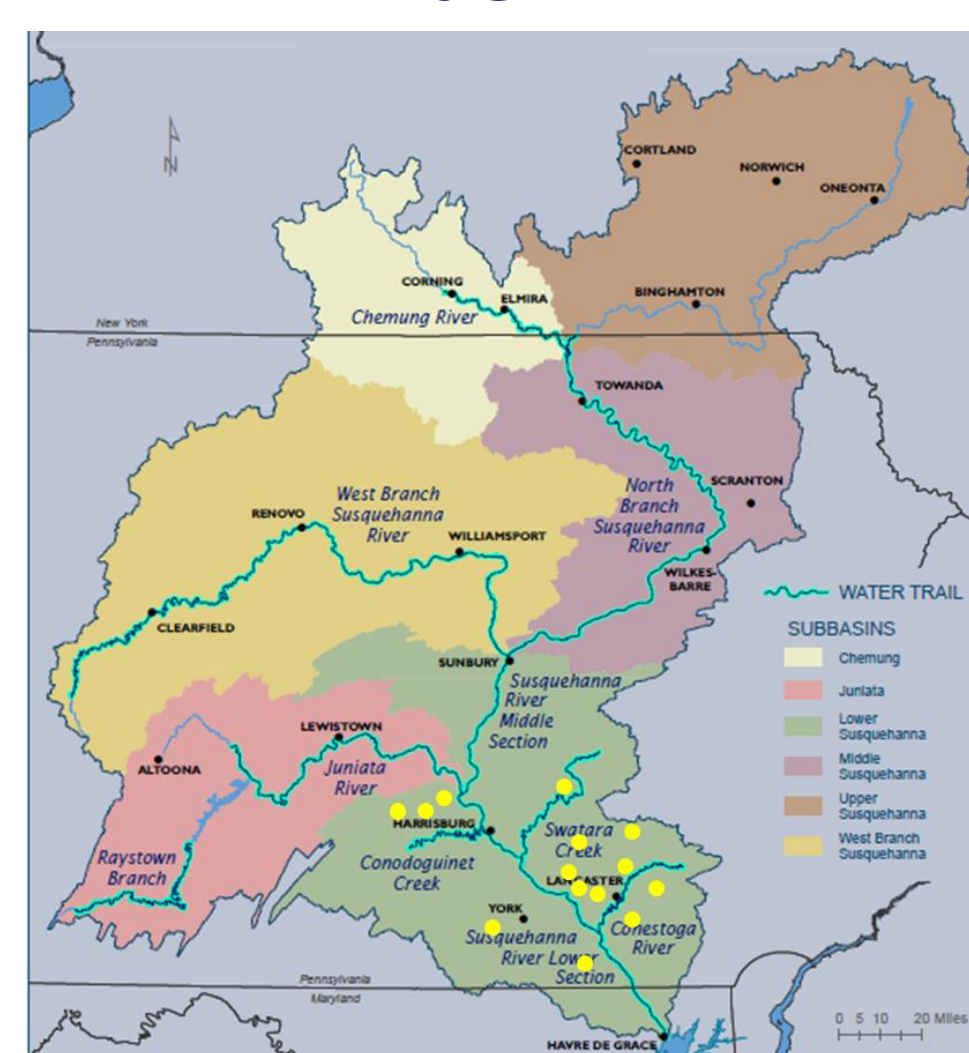
Introduction

- Chesapeake Bay has a 64,000 square mile drainage basin and is the largest of 130 estuaries in the US.
- 22% of the land area in the Chesapeake Bay Watershed is in agriculture with 87,000 farms
 - 44% of N and P loadings come from agriculture
- Susquehanna River Basin contributes 72% of the nonpoint source pollution of N and P into the Chesapeake Bay.
- Pennsylvania agriculture contributes 80% of nonpoint source pollution of N and P into the Susquehanna River Basin
- Project farms based in Lower Susquehanna River Sub-basin, a hot spot for agricultural loading in the bay region

Chesapeake Bay Watershed



Susquehanna River Basin



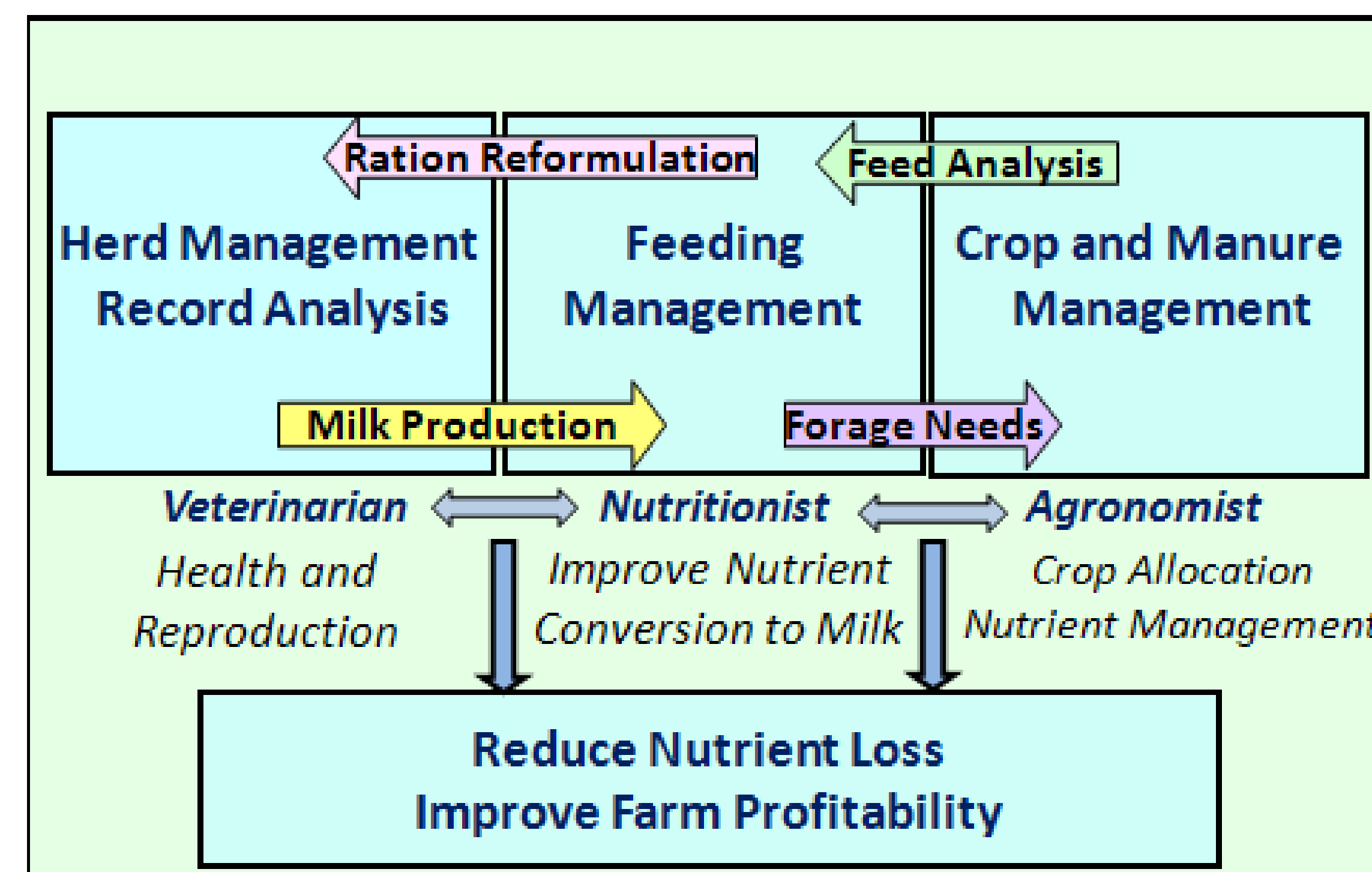
Objectives

- To develop and implement nutrition and management interventions on small to medium dairy farms to improve health and productivity and to reduce N and P losses to the Chesapeake Bay.
- To assess compliance of farms in adopting recommendations by project leaders and collaborators thru evaluation of production, reproduction, milk urea N and fecal P.

Methods

- Ten farms with less than 200 dairy cows and not under environmental regulations were selected from the Lower Susquehanna River Sub-basin.
- Farms participated in an integrated nutrient management program in collaboration with herd veterinarians, nutritionists, and agronomists to improve efficiency in nutrient intake and excretion.

IMP (Integrated Management Program)



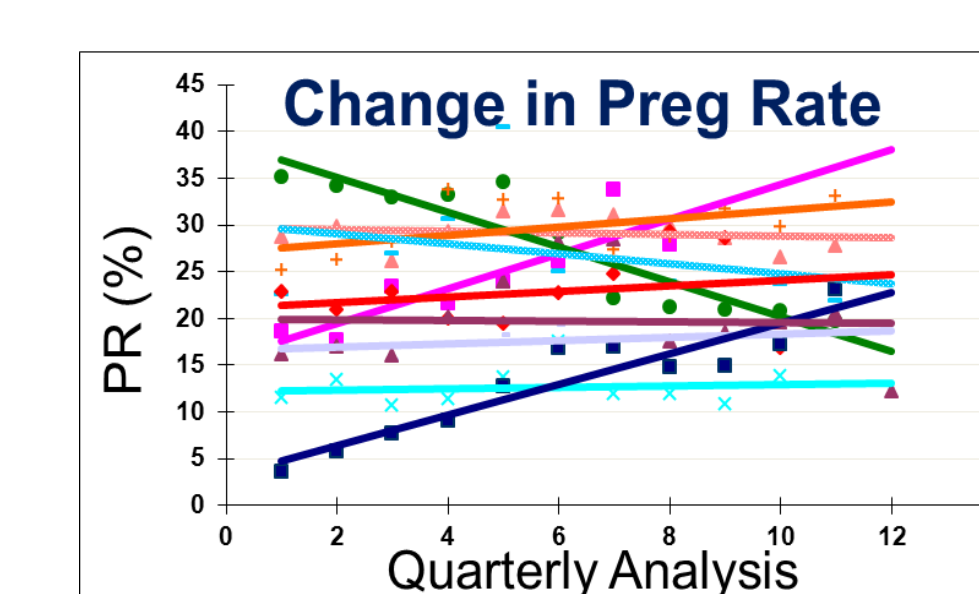
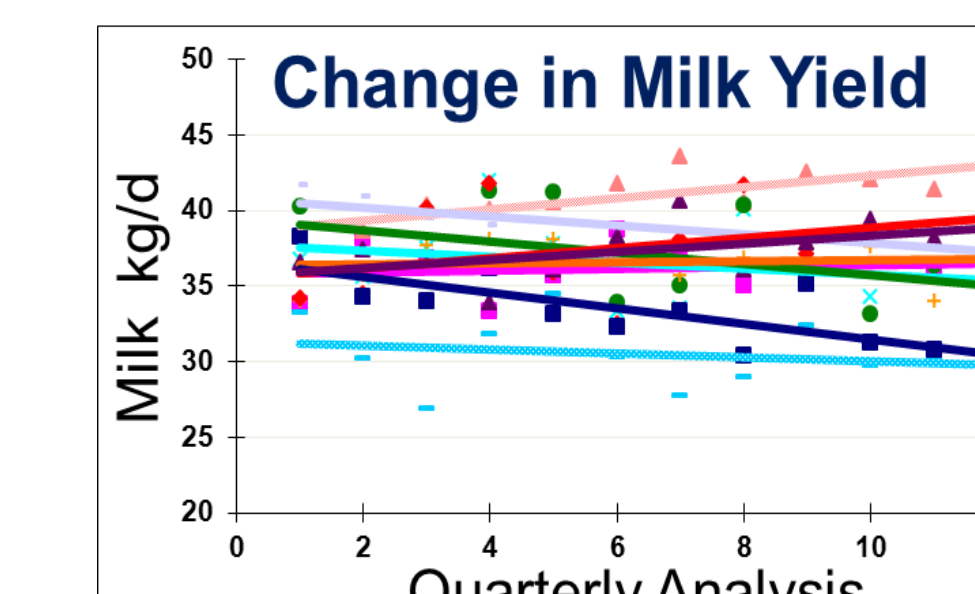
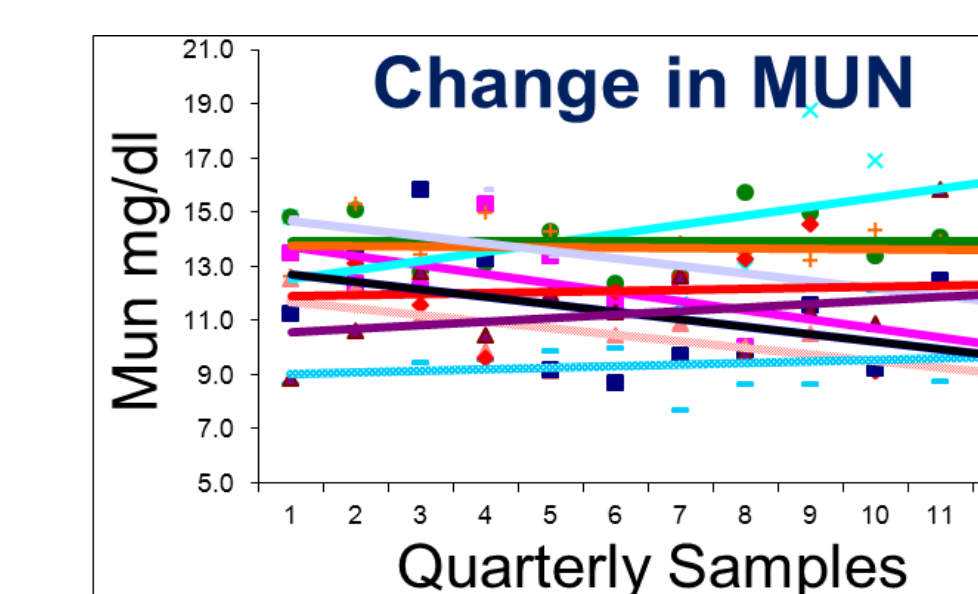
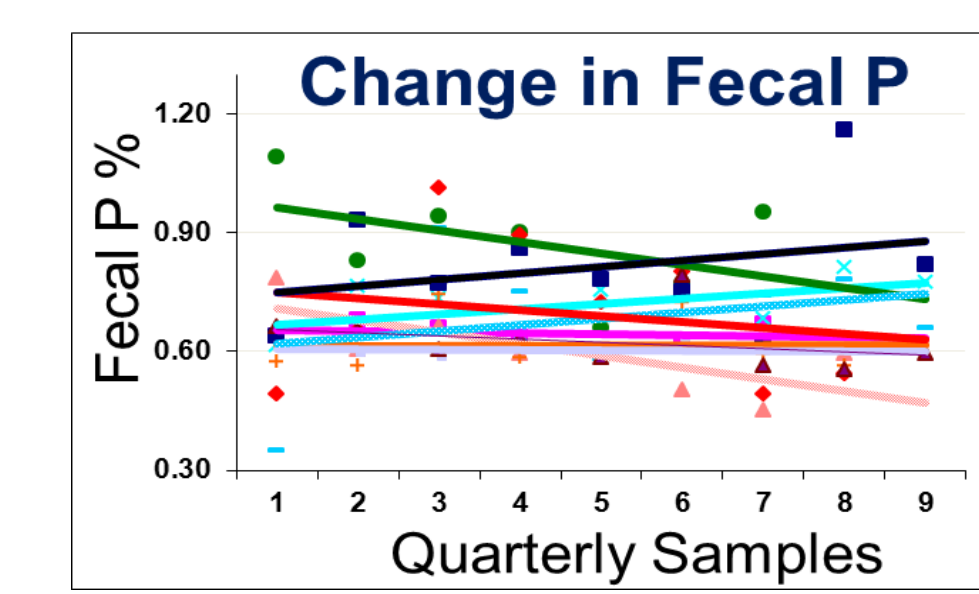
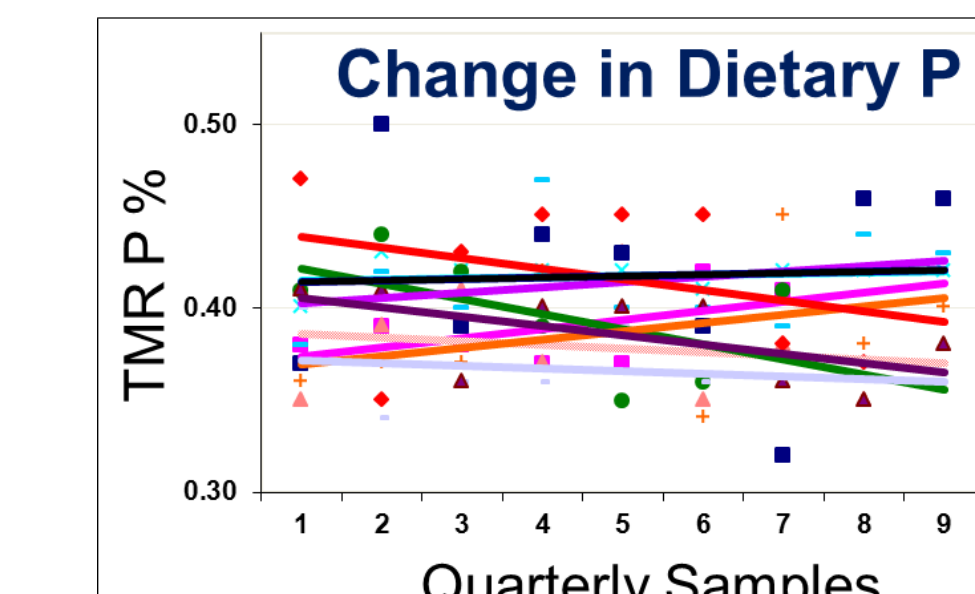
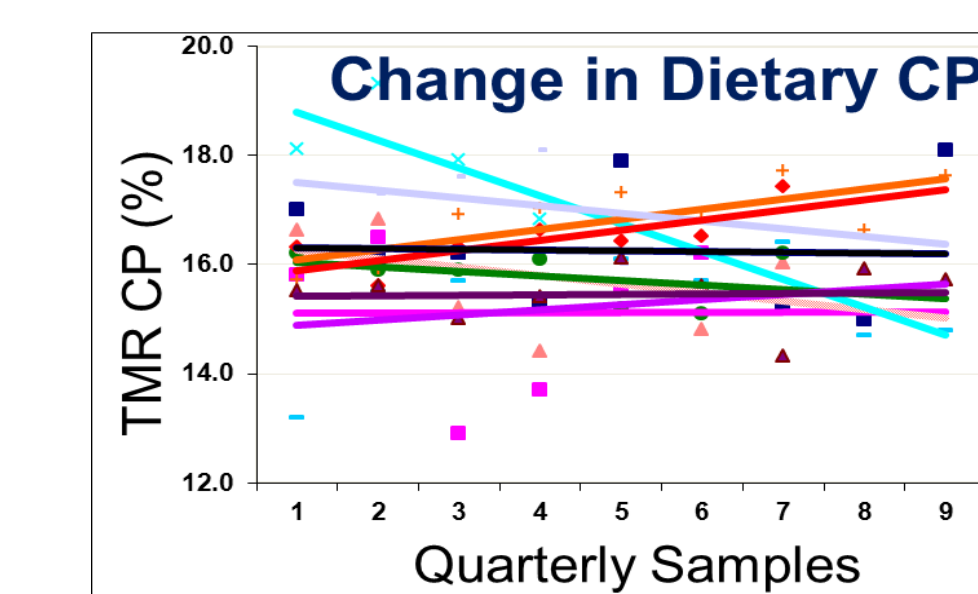
Sampling Protocol

- Monthly DHIA herd sampling with MUN
- Quarterly forage, feed, and fecal samples
- Wet chemistry, Cumberland Valley Analytical Service
- Manure and soil testing for manure application

Farm Visits

- Project field investigation veterinarians visited farms quarterly and obtained samples
- Reviewed monthly DHIA herd analysis for production and reproduction with producer
- Ration assessment using CPM Dairy
- Reproductive analysis using RepMon

Results



Summary

Nutritionists

- Ration CP was reduced on 4 farms with 80% of farms trending at or below 16% CP in the TMR
- MUN was reduced or maintained at or below 12 mg/dl on 70% of farms.
- TMR P was <0.40% on 8 farms with corresponding fecal P <0.70% on 6 of the 8 herds and >0.70% in 2 herds due to top-dressing grain not sampled in the TMR
- Milk production increased on 40% of farms and 60% of farms maintained >35 kg milk/cow/day.

Veterinarians

- 50% of herds increased pregnancy rate or had PR >25%.
- 60% of farms used veterinarians to balance diets and to control feed costs
- Veterinarians had an impact on herd management

Agronomists

- Agronomists had a positive influence on 80% of farms instituting cover crops and double cropping, manure application and fertilization, and crop allocation.

Conclusions

- Most producers complied well with industry advisors to meet project goals.
- Lowering of ration CP%, MUN, and fecal P occurred on the majority of study farms reducing N and P excretion into the environment and into Chesapeake Bay Watershed.
- Milk production increased on several farms in conjunction with lower CP diets improving nutrient conversion to milk.
- Improvement in milk yield and reproductive efficiency enhances farm profitability