

You can reduce excess nutrients

Linking feeding and forage management helps protect water quality while reducing feed costs and increasing profits on dairies

By Danny Fox, Tom Tylutki and Greg Albrecht

Many studies on New York dairies showed that, on average, more than two-thirds of the nitrogen (N) and phosphorus (P) imported as purchased feed wasn't exported as milk or meat. These excess nutrients, which end up in the air, soil and water, increase a dairy's environmental risk.

Four solutions to excess nutrients

Dairies can export manure to address excess nutrients. But that's not practical or economical for most Northeast dairies at this time. There are other options. Our studies indicate that most dairies can take four approaches to address excess nutrients. These examples of Agricultural Environmental Management (AEM) decrease imported N and P, lower the risk to water quality and increase business profits.

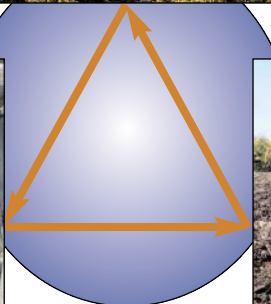
1. Precision feeding. Producers can minimize excess N and P in rations by accurately determining three things: the nutrient requirements of each group in a herd, the availability of nutrients from each feed grown, and supplemental nutrients imported to balance rations that maintain acceptable milk production.

Over the past 10 years, we've developed the Cornell Net Carbohydrate and Protein System (CNCPS) for precision feeding and herd nutrient management. It:

- Develops optimum diets for each group of animals based on farm-specific nutrient requirements and available feed nutrients.
- Computes income over feed costs.
- Predicts annual requirements for each feed fed and total herd N, P and potassium (K) excreted from homegrown and purchased feed for each alternative feeding plan evaluated.

Implementation of precision feeding with the CNCPS on dairy farms in central New York typically reduced excess N and P excreted by up to one-third and reduced annual feed costs by as much as \$130 per lactating dairy cow. (See "Nitrogen - the N in nutrient management" on page 27)

Because precision feeding removes safety



factors in a ration, producers must do more feed analysis and management to ensure rations fed to cows match what's formulated.

2. Improved forage management. Priorities for forage management include matching the forage type to the soils, improving forage yields and managing forage quality. Combined with precision feeding management, these practices allow for higher forage rations while maintaining or improving milk production.

An analysis of one 350-cow dairy in central New York indicated forage yields averaged considerably less than the farm's maximum potential. Increasing forage yields to soil potential would reduce excess N by 29%, P by 49% and K by 105%. Annual returns over feed costs would increase by \$70,579.

This dairy improved crop rotations, agronomic nutrient management, corn hybrid and maturity selection, weed control, and human resource management to increase yields. Corn silage increased by 2,056 pounds of dry matter (DM) per acre, alfalfa silage by 1,609 pounds DM per acre and grass silage by 1,252 pounds DM per acre. This allowed the dairy to use more homegrown forages and reduce purchased hay, corn silage and protein concentrates.

In another case study on a 500-cow dairy farm, changing crop rotations to better match land resources resulted in its using intensive grass management on more acid hillside soils. The high N demand and yield of intensively

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FYI

■ The CNCPS and Cropware are available to any New York user at no charge. The CNCPS is also available at no charge to Pennsylvania and Vermont users. Contact Michelle Cole for these programs. Tel: (607) 255-2855. E-mail: mlc44@cornell.edu. For more nutrient management information or to download Cropware from the web, visit the Nutrient Management Spear Program website, led by Quirine Ketterings, assistant professor in the Soil, Crop and Atmospheric Sciences Department: www.css.cornell.edu/nutmgmt.

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