



## Dairy Evaluates Mass Nutrient Balance

By Karl Czymmek

Bill and Penney Cook operate Aurora Ridge Dairy, Aurora, N.Y., with their partner, Jason Burroughs. The dairy consists of 1,500 dairy cows and 2,000 acres of corn for silage and alfalfa/grass hay. It's earned a well-deserved reputation of being well-managed and productive.

The Cooks and Burroughs first learned about the concept of "mass nutrient balance" in the early 1990s when they participated in a project with Cornell researchers trying to better understand the flow of nutrients into, within and away from dairies.

The partners are aware of public concerns about the potential impact of dairy farm nutrients, and they're interested in finding ways to reduce any environmental impact. So last year when Caroline Rasmussen, mass nutrient balance project manager, approached Bill Cook about the project, he was willing to take another look at his dairy's mass nutrient balance. He would learn how his 2004 results compared to the 1993 mass nutrient balance study, and the study results would provide direction for what nutrient areas Aurora Ridge could work on next.

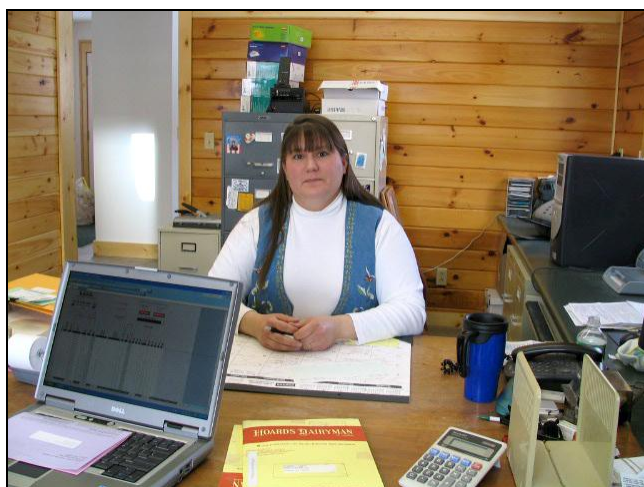


Figure 1: Kelly Thomas, office manager for Aurora Ridge Dairy, was instrumental in helping to collect the information needed to develop the dairy's mass balance.

Compared to the 1993 mass nutrient balance, Cook learned the following from the 2004 study:

Like virtually all dairies, Aurora Ridge continues to import more phosphorus (P) than it exports annually. But the dairy's P use has become much more efficient because it has cut the balance per acre by about 50%.

This makes sense to Cook: The dairy is exporting much more P in milk due to increased milk production while cutting back on P use in dairy rations and crop fertilizer over the years.

On the nitrogen (N) side of things, the 2004 data indicated the N balance per acre was a little higher than it had been in 1993.

Cook wanted to learn more about how mass nutrient balance figures are calculated, what the numbers may indicate and, especially, what profitable opportunities exist to use N differently.

"I called a meeting at the farm that included our crop and herd managers, nutritionist and crop consultant, as well as Cornell research and Extension faculty, to discuss our farm mass balance data and to look at potential areas of improvement," Cook says.

"As a result, we are getting more conservative with protein in the ration. We are willing to do this so long as we can continue to have high milk production. So far it's working."

On the crop side, Aurora Ridge Dairy is also looking at ways to make better use of nitrogen from manure and sod.

"The mass balance concept is always in the back of our minds now when we make decisions that affect nutrient use, especially in terms of nitrogen," Cook says.

To track progress annually, the dairy plans to calculate a farm mass nutrient balance each year, as long as it makes sense.

"There is a lot more to learn about how to manage a farm mass nutrient balance, but there is a body of evidence indicating that

dairy farms do have extra nutrients that can be lost to the environment, and we need to find ways to reduce those losses,” Cook says. “Bringing fewer nutrients to the farm in the first place and using the nutrients that are on the farm more efficiently seems like good places to target.”

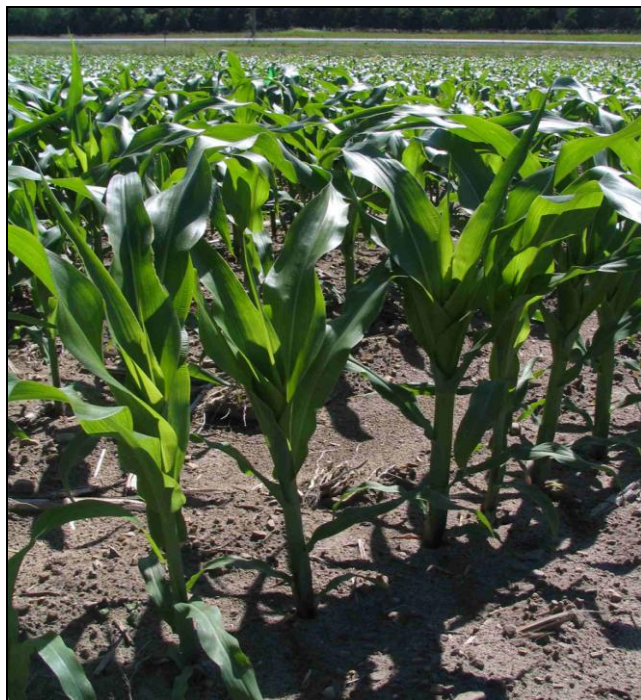


Figure 2: Corn as a major forage crop in NY.

### Environmental goals in words

Aurora Ridge Dairy's environmental mission statement reads:

- Aurora Ridge Dairy will strive to be excellent stewards of the soils, water and air. We will farm in a manner that utilizes the natural advantages of these soils to grow high quality forages, utilizing nutrients produced by the dairy. We will work hard to control nutrients, pathogens and odors from leaving our dairy.
- We are aware that every decision we make as managers has an impact on the environment. We will make every effort to make environmentally informed decisions.
- We will work to maximize and reuse our inputs. We will recycle as much of the material that comes onto the farm as possible, including the paper, plastics, metals, oils and tires.
- We will keep the farm buildings and properties clean, neat and well repaired.
- We will work to have the farm blend in with the natural

beauty of the area.

- We are committed to meet and exceed environmental regulations to protect the health of our families, employees and neighbors.
- We will move forward preserving and improving soil productivity, recycling nutrients for crop use, recycling other consumables, and considering any technology that helps to reuse inputs. We will especially consider technologies that will have a positive impact on our neighbors.
- We are committed to continual improvement in everything that we do.

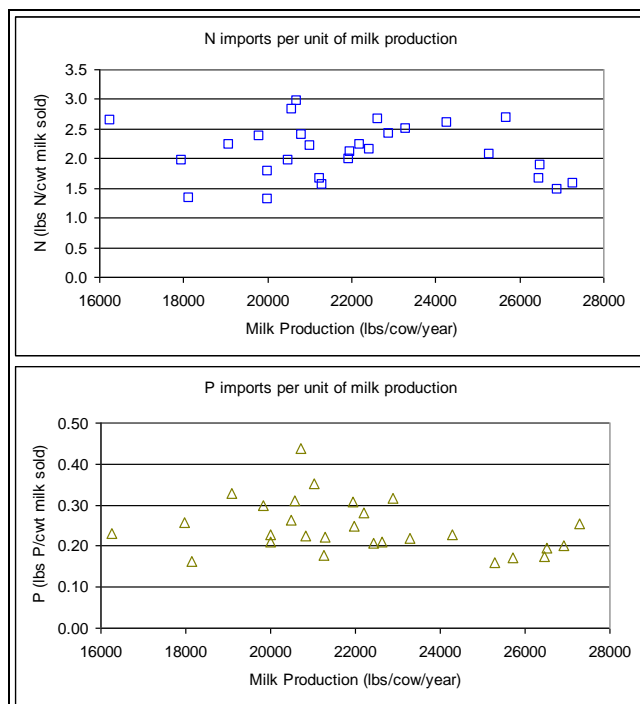


Figure 3. N and P imports per unit of milk production for 27 New York dairies shows some farms to be more efficient than others.

(May 1, 2011)

This impact statement was first published in The Manager, Northeastern DairyBusiness April 2006 issue. Page 23. Figure 3 appeared in the article “Striking the right balance” in the same issue (pages 21-22). To learn about and participate in the statewide whole farm nutrient mass balance project, check out the NMB project website of the Cornell Nutrient Management Spear Program: <http://nmsp.cals.cornell.edu/projects/massbalance.html>.



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The **Nutrient Management Spear Program (Nmsp)** is an applied research, teaching and extension program for field crop fertilizer and manure management on dairy and livestock farms. It is a collaboration among faculty, staff and students in the Department of Animal Science, Cornell Cooperative Extension, and PRO-DAIRY. Our vision is to assess current knowledge, identify research and educational needs, facilitate new research, technology and knowledge transfer, and aid in the on-farm implementation of strategies for field crop nutrient management including timely application of organic and inorganic nutrient sources to improve farm profitability while protecting the environment. An integrated network approach is used to address research, extension and teaching priorities in nutrient management in New York State. For more information on Nmsp projects and extension/teaching activities, visit the program website (<http://nmsp.cals.cornell.edu>) or contact Quirine Ketterings at [qmk2@cornell.edu](mailto:qmk2@cornell.edu) or (607) 255-3061.