



# DAIRY NEWS

## NITROGEN BALANCES IN DAIRY FARMS

Alejandro R. Castillo

UC Cooperative Extension Merced and Stanislaus Counties

Additional environmental regulations are going to affect all California dairies. Keeping records of all the nutrient inputs (purchases) and outputs (sales) of the dairy farm will be the key strategy to answer the regulatory enquires. Due to its relationship with underground water contamination (nitrates) and air emissions, nitrogen (N) is one of the main nutrients under regulatory control, followed by phosphorus (P) and potassium (K). The aim of this newsletter is to think about what the components of the nitrogen balance are, and which records we have to consider for managing this situation.

The main N inputs and N outputs in a dairy farm are described in the following Figure:

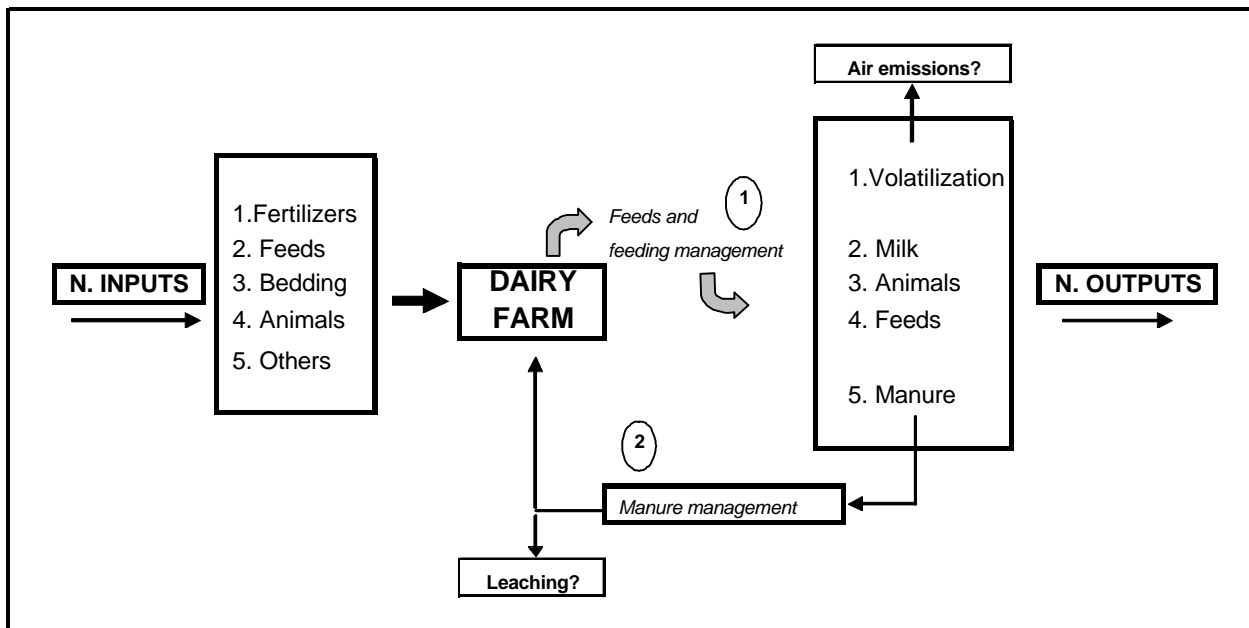


Figure 1. Nitrogen balances in dairy farms

The objective of the new regulations is to decrease N losses to the environment. The only way to control nitrogen losses to the environment is improving the efficiency of N utilization, that is, decreasing the N inputs and/or increasing the N outputs. From the environmental point of view, the two areas where dairy farmers can produce an important impact are indicated in Figure 1. These are *feeds and feeding management*, and *manure management*. Both are highly related to each other. Any change or improvement in one of them can have an important effect on the other.

### 1. *Feeds and feeding management.*

A high proportion of N inputs and outputs are related to the feeds and feeding management. Different newsletters were published on this subject by UC Cooperative Extension in Merced County. Clearly, maximizing forage production on the farm (multi-crop forage production) and animal nutrition (grouping animals and balance diets) are the best ways to improve the efficiency of N utilization. That means, decreasing the purchase of feeds and fertilizers, and/or increasing homegrown feeds and animals' products (feed, milk and meat).

### 2. *Manure management.*

From January 2004 to December 2006, every dairy farm in Merced County has to prepare a Nutrient Management Plan. This is going to be an excellent opportunity for many farmers to learn how to do a Comprehensive Nutrient Management Plan (CNMP). It will be necessary to find an equilibrium between manure production (animal stocking rate) and land applications (forage production). In the near future, the manure applications to cropland will be based on agronomic rates, or in other words considering crop needs. The idea is to reduce application rates which are far in excess of crop needs. This will reduce or minimize N losses to the environment by leaching or volatilization (see Figure 1). Manure applications or distributions have to be done close to the planting as possible, and according to: (a) an estimation of N uptake of the crops, (b) an estimation of the amount of manure being applied, and (c) comparing the crop needs to the application rates and adjusting the rates were imbalances are large.

### Some recommendations

- Keep records of all your purchases (Inputs). For example: feeds, fertilizers, bedding, and animals' entrance to the farm.
- Maintain a strict control (records) of all your outputs. For instance: milk (protein content), animals, feeds, and especially manures if you are selling them.
- Consider if your manure storage capacity (dry and liquid manures), is according to the coming regulatory rules. Start by estimating amounts of dry and liquid manure and keeping records of recent applications.
- Consult your adviser about Nitrogen Balances and make a plan in your dairy for the next two year.