Western Dairy News is a collaborative effort of Dairy Specialists from:
minimize the excreted nitrogen and therefore reduce the volatile solids and reduce land requirements for manure dispositions.

Maintaining neighborly relationships will be critical as implementation of nutrient management plans may require access to additional cropland or longer transport distance for manure application. Eliminating and cleaning up manure spills or mud on public right of ways such as road may require additional levels of management to be implemented to ensure there are no adverse effects on the public.

**Water**

Water is required not only for the milk parlor and water troughs but also for the manure handling systems. Most manufacturers of solids separation equipment prefer the water in the lagoon(s) or holding ponds to be less than 3 percent total solids. Table 1 illustrates the additional water required to maintain a desired solid content in a lagoon based on separator efficiency. This is water in addition to the urine. Additional water may come from parlor wash water, extraneous drainage such as roof or driveway runoff, surface rainwater, etc. Approximately 204 gallons per day per cow (g/d/c) is required if there is no solid separation and the desired solids content is 1 percent. Only 8 g/d/c is required if 60 percent of the solids are removed and the acceptable solid contents is 5 percent.

Table 2 shows the volume entering a containment structure that annually must be pumped per 500 cows. There is a fine balance between integrating proper water conservation practices and ensuring adequate fresh water is added to the system. This trend will be to reduce water usage as a nutrient management plan is implemented and manure nutrients are transported further distances. The total quantity of nutrients will be similar when water conservation practices are installed.

**System operation**

Milk parlor employees understand the importance of following protocol and standard operating procedures. These become routine in the milk parlor or feed center. There are economic risks associated when protocols are not followed. Many dairies agreed in principle to follow the protocol and operational procedures during the design phase, however, once operational, the commitments often begin to dissipate.

One-way to reduce manure handling costs, particularly with custom applicators, is to lower the waste volume. For example, if a 1,000-cow dairy spends one cent per gallon of material pumped and lowers the daily water added to the system by 10 g/d/c, then the annual savings is over $36,000.

![Figure 1: Impact of a comprehensive nutrient management plan on land requirements if the land base requirements increase from 1 or 2 acres per cow to 3 acres per cow.](image_url)

This reduction affects the manure handling system if the water was an integral part of the design process.

However, the associated risk will potentially increase air quality problems (lagoon nutrient overload) or change the nutrient management plan. Nutrient overload results in potential increases in air emission problems since the anaerobic bacteria may not survive. These bacteria help break down solids entering liquid containment.

As with any system, there are interruptions due to weather or equipment failure. An emergency plan must be developed and ready for implementation if needed. This includes procedures for handling anticipated problems or interruptions, including those in the manure management area. The emergency plan may require scraping and temporarily stockpiling manure rather than overloading the system. Following recommended maintenance guidelines on each component help minimize system interruptions.

**State and federal regulatory governing bodies**

Individual states have governing bodies that administer state and federal regulations concerning runoff control from confined feeding sites. The state agency professionals are responsible for enforcing the regulations and governing statues. The dairy industry is responsible for delivery of a wholesome milk product that is safe to consume while the governing bodies are responsible for ensuring a water supply safe for drinking and recreational activities.

There may be disagreement with interpretations of the regulations and evaluation of a site; the state agencies ultimately are seeking to protect the public. Generally, the guidelines established are the minimum standards. Government programs such as EQIP meet these minimum standards but may have additional requirements. Each time a dairy ignores environmental responsibilities there is the potential for additional regulations to be applied to the industry.

**Summary**

Dairy producers must control manure nutrients generated at their facilities. Survival in the 21st century will require cooperation of the management of the each component on a dairy.

Western Dairy News is published as a service to people interested in the health and welfare of the Western dairy industry. Archives of this publication may be found at: http://animalscience-extension.tamu.edu/dairy/wdn.html

For further information contact: Dr. Ragan Adams, Editor IDA, CSU-VTH 300 W. Drake Road Fort Collins, CO 80523 970-297-0371 radams@lamar.colostate.edu

Material published in Western Dairy News is not subject to copyright. Permission is therefore granted to reproduce articles, although acknowledgement of the source is requested.

Cooperative Extension programs are available to all without discrimination.