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SUPERIOR CALIFORNIA DAIRY REVIEW

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Farm Advisor

California Dairy Quality Assurance Program-Environmental Certification

Producers who have gone through all 3 classes of the Environmental Stewardship Short Course and have completed all the homework are eligible to go through the CDQAP Certification. Once certified, the dairy may receive a discount on the water quality permitting fees. If you are interested in certification, call the CDQAP Information Center at 1-866-662-3727.

If you have not yet attended the Environmental Stewardship Short Course, please call Barbara Reed at the Glenn County Cooperative Extension Office (865-1107, Ext. 7) for more information. There are no classes scheduled at this time, but we will schedule more classes if there is sufficient demand. It is likely that classes will be held regionally and not in Orland, due to fewer numbers of dairy producers requesting classes.

EC Meters for Sale

We have re-ordered our supply of EC meters. These are a great tool for monitoring any water you may want to discharge off of your property. It only takes a minute or two and you will know if the water should be retained on your property. The meter uses electrical conductivity (EC) to measure dissolved salts in the water. Lagoon water would have a reading in the thousands and clean water should have a reading around 100. The meter comes with a bottle of standard solution so you can keep the meter calibrated. The meter should be rinsed with deionized water after each use. You can get deionized water at most grocery stores these days. The costs for each meter is $ 65.00.

Drinking Water Guidelines for Dairy Animals

Alejandro R. Castillo & John H. Kirk
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According to the National Research Council (NRC, 2001) water quality for both humans and livestock can be defined on five criteria: **organoleptic properties** (odor and taste), **physiochemical properties** (pH, total dissolved solids, total dissolved oxygen, and hardness), **presence of toxic compounds** (heavy metals, toxic minerals, organophosphates and hydrocarbons), **presence of excess minerals or compounds** (nitrates, sodium, sulfate, iron, etc), and **presence of microorganism** (bacteria, viruses, protozoa or parasites). It is important to mention that research information on water contaminants and their effects on cattle performance is sparse (NRC, 2001).

(continued)

Salinity, Total Dissolved Solids (TDS) and Total Soluble Salts (TSS) are measures of soluble components in water. The salt, sodium chloride is the primary consideration in this category, but other components associated with salinity are bicarbonate, sulfate, calcium, magnesium, silica, iron, nitrate, strontium, potassium, carbonate, phosphorus, boron, and fluoride. The following table (Table 1) is a guideline for Total Soluble Salts in water for dairy cattle.

Table 1. Guideline for Total Soluble Salts (TSS) in water for dairy cattle (NRC, 2001)

TSS (mg/L)	**Comments**
< 1000	Safe and should pose no health problems
1000-2999	Generally safe but may cause a mild temporary diarrhea in animals not accustomed to the water
3000-4999	Water may be refused when first offered to animals or cause temporary diarrhea. Animal performance may be less than optimum because water intake is not maximized
5000-6999	Avoid this water for pregnant or lactating animals. May be offered with reasonable safety to animals where maximum performance is not required
> 7000	These waters should not be fed for cattle. Health problems and /or poor production will result

Nitrate and sulfate are also common components in Total Soluble Salts. Nitrate recommendations in drinking water are shown in Table 2. Most likely the water nitrate concentration recommended limits (>440 mg/L) will not result in visible disease condition. A general recommendation for sulfates is less than 500 mg/L for calves and 1000 mg/L for adult cattle. When sulfates exceed 500 mg/L, the specific salt should be identified. Hydrogen sulfide is the most toxic form and concentrations as low as 0.1 mg/L can reduce water intake. Common forms of sulfate in water are calcium, iron, magnesium, and sodium. All are laxative, but sodium sulfate is the most potent. Excessive levels of sulfates may also reduce the absorption of other minerals like copper and selenium, and creating a need for adjustments in dietary supplemental levels.

Table 2. Nitrates in water (NRC 2001)

Nitrates (NO_3) mg/L	**Guidelines for ruminants**
0-44	Safe for consumption
45-132	Generally safe in balance diets with low nitrate feeds
133-220	Could be harmful if consumed over long periods
221-660	Cattle at risk, upper limits may affect rate of gain, fertility, and possible death
> 660	Unsafe, may cause suffocation, incoordination or staggering, and possible death, should not be used as a source of water

Minerals that have to be considered for analysis and the guidelines for assessing them in the drinking water for cattle are described in Table 3. **These minerals have to be included in the total mineral balance in diets of all animal categories.** The mineral mix supplements have to be formulated according to the deficits and/or the animal's requirements. Based on the normal composition of feeds and drinking water, tailor made mineral mixes have to be developed for each dairy farm.

Table 3. Minerals in the drinking water (Zinpro Water Analysis Program, Version 2.0, 2002)

Mineral (mg/L)	**Desired levels***	**Maximum upper levels****
Calcium	< 100	200
Chloride	< 100	300
Copper	< 0.2	0.5
Iron	< 0.2	0.4
Magnesium	< 50	100
Manganese	< 0.05	0.5
Phosphorus	< 0.7	0.7
Potassium	< 20	20
Selenium	< 0.05	0.1
Sodium	< 50	300
Sulfur	< 50	300
Zinc	< 5	25

*** Animals consuming water exceeding these limits may reduce performance**

**** The consumption of this water poses a potential animal health risk**

As pointed out, the effects of some water characteristics on livestock are not definitely known. However, it is felt that hardness and pH (physiochemical properties) do not affect water consumption. Water troughs are also an important source of exposure of cattle to bacteria including the human food-borne pathogens. Coliforms, salmonella, and E. coli 0157 have been isolated from livestock water. For this reason, it is important to clean and sanitize the water trough regularly.

Remember, water is the most important nutrient for dairy animals. Water should be always available to your animals in a clean, fresh abundant supply. Cows producing 100 pounds of milk per day need nearly 40 gallons of water each cow. If it is the first time that you are going to analyze the water in your farm, you should also include microorganism and possible toxic nutrients. Improperly balanced and/or overfeeding minerals is just wasting your money. It also may be affecting animal performance (health and productivity), and the quality of your soils. All the minerals in excess of dietary requirements will be excreted in feces and urine. Whether in dry manure or in lagoon water, some of these minerals will be applied to the soil. It is a good idea to check the water quality for the animals at least twice a year (winter and summer) and consult your nutritionist to include the contribution of your water to the total diet mineral balance.

Nitrogen Balances in Dairy Farms

Alejandro R. Castillo, UC Cooperative Extension Merced

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 requests. 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 article 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:

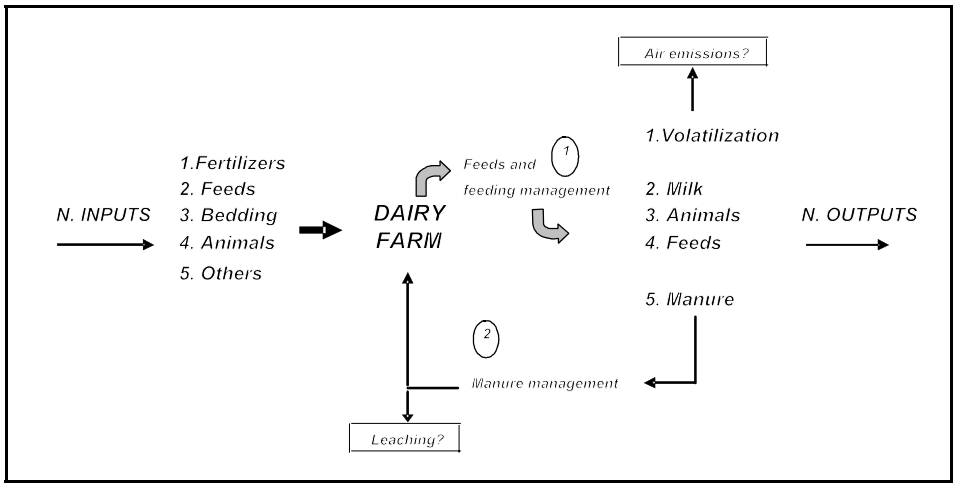

Figure 1. Nitrogen balances in dairy farms

One 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. 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 as 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 where imbalances are large.

Some recommendations:

1. Keep records of all your purchases (Inputs). For example: feeds, fertilizers, bedding, and animals' entrance to the farm.
2. Maintain a strict control (records) of all your outputs. For instance: milk (protein content), animals, feeds, and especially manures if you are selling them.
3. 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.
4. Consult your crop advisor about nitrogen balances and make a plan in your dairy for the next two years.

3rd Annual Farmstead Cheesemaking Workshop - Only A Few Spaces Left!!!!

A Farmstead Cheesemaking Workshop will be held in Orland, CA, April 21-23, 2004. This program is sponsored by the University of California Cooperative Extension. Enrollment is limited to 10 participants and the $300 fee includes 3 lunches, detailed class materials, and field trips to 2 cheese making operations. This is a 3-day workshop for novice and experienced cheese makers, focusing on commercial cheese making. The course goals are to provide dairy producers with hands-on experience in small-scale cheese production, introduce principles of safe production of a food product on the farm, provide producers with adequate information about the demands presented by vertical integration of their business, provide general information on design and maintenance of curing rooms, equipment selection and layout, plant design, and cost of production analysis, and to present data on artisan cheese marketing and market research and the challenges presented in direct marketing and promotion of your own product. Hands-on cheese making will be done at Pedrozo Dairy and Cheese Company. Classroom lectures will be held at the Glenn County Cooperative Extension Office, both located in Orland, CA. On the third day, there will be a field trip to the Sierra Nevada Cheese Company in Willows. Participants will make their own lodging arrangements in Orland, Willows or Chico. There may be one informal no-host dinner get-together if participants are interested. The registration fee must be paid in advance to reserve your spot in the class.

You can log on to the link below for a registration form and class information, or call 530-865-1107 to have a form mailed to you. http://ceglenn.ucdavis.edu/Dairy/Farmstead_Cheesemaking_Workshop.htm

DHIA Data for February

February DHIA Averages for N. Sacramento Valley Herds

ROLLING HERD AVERAGE	BREED				Overall Average
	Brown Swiss	Holstein	Jersey	Other	
# of Cows	51	379	296	124	331
Lbs Milk	21557	20336	14441	15531	18254
% Fat	3.90	3.59	4.53	4.36	3.94
Lbs Fat	840	731	655	674	707
% Protein	3.34	2.87	3.63	3.43	3.16
Lbs Protein	719	604	526	531	577
Somatic Cell Count (1,000)	400	344	325	348	339
% CULL	33	33	24	42	30
Calving Interval	13.3	14.7	13.7	14.4	14.3
Average Services/Conception	6	3	3	3	3
Percent conception at 1st service	32	29	38	35	32
Average days open	217	159	151	159	158
Average Days in Milk at 1st service	67	82	78	90	81

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