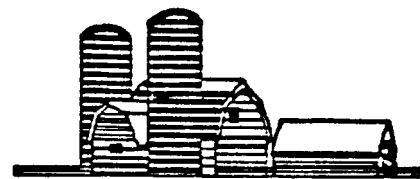


21st Century Dairying



A dairy newsletter for Fresno and Madera Counties

September 2007

FRESNO OFFICE

1720 S. Maple Avenue

Fresno, CA 93702

(559) 456-7285

(559) 456-7558

Fax (559) 456-7575

E-mail: gehigginbotham@ucdavis.edu

Website:

cefresno.ucdavis.edu

MADERA OFFICE

328 Madera Avenue

Madera, CA 93637

(559) 675-7879

Fax (559) 675-0639

Web site:

cemadera.ucdavis.edu

New Central Valley water quality rules: What dairy producers need to do now—and what to expect soon

On June 29, the Central Valley Regional Water Quality Control Board sent certified mail notices to dairy producers regarding new water quality regulations. These regulations are in effect immediately. California Dairy Quality Assurance Program (CDQAP) will host free workshops starting this fall to assist producers in compliance with the regulations, (see workshop dates on next page).

The classes will offer producers a “plain English” explanation of the regulations, and will review the schedule for phasing in the new rules. UC Cooperative Extension dairy management experts will discuss suggested best management practices going forward. Finally, the workshops will provide assistance and tips for completing reports and forms for the first key deadline on December 31, 2007. Producers will leave the workshops knowing what they

In This Issue

New Central Valley Water Quality Rules 1-2

Complying with the General Order—Where to Begin..... Insert

Surviving the Integration of Management Insert of a Dairy and Manure

The Correlation Between Body Condition Score and Fertility in Lactating Dairy Cows..... 3



The University of California, in accordance with applicable Federal and State law and University policy, prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related), ancestry, marital status, or age. The University of California also prohibits discrimination on the basis of sexual orientation, status as a Vietnam-era veteran or special disabled veteran, or, within the limits imposed by law or University policy, on the basis of citizenship.

In conformance with applicable law and University policy, the University of California is an affirmative action/equal opportunity employer. The University undertakes affirmative action for under-represented minorities and women, for persons with disabilities, and for Vietnam-era veterans and special disabled veterans. Inquiries regarding this policy may be addressed to the Affirmative Action Director, University of California, Agriculture and Natural Resources, 1111 Franklin Street, 6th Floor, Oakland, CA 94607-5200. (510) 987-0097.

continued from page 1,

have to do, how to get the job done, and where to get help.

Many of the WDR requirements will be phased in over several years, however Attachment B of the June 29 mailing listed several items that must be started now, including:

Beginning immediately:

- ◆ Inspecting the production area
- ◆ Monthly photographs of pond freeboard
- ◆ Prevent vector problems
- ◆ Inspect land application areas daily
- ◆ Maintain a storage area for records
- ◆ Complete a tracking manifest for every transfer off-site of manure or wastewater
- ◆ Report any noncompliance events
- ◆ No burying or composting animals onsite

Beginning soon:

- ◆ October - Monitor discharges of manure, stormwater, tailwater, process wastewater
- ◆ November - Sample each domestic and agricultural well and tile drain
- ◆ December - Prepare written agreements with any person receiving process wastewater

Please save the dates below. Dates and times for the CDQAP workshops are as follows:

Date	Time	Location
10/04	9:30-12:30 and 1:30-4:30	Kountry Kitchen in Orland
10/16	9:30-12:30	Kern Co. Extension classroom in Bakersfield
10/17	9:30-12:30 and 1:30-4:30	Veterans Memorial Hall in Riverdale
10/18	9:30-12:30 and 1:30-4:30	Merced Co. Extension classroom in Merced
10/23	9:30-12:30 and 1:30-4:30	Tulare Co. Extension auditorium in Tulare
10/24	9:30-12:30 and 1:30-4:30	Little Theatre — Chowchilla Fairgrounds
10/25	9:30-12:30 and 1:30-4:30	San Joaquin Co. Extension classroom in Stockton
10/30	9:30-12:30 and 1:30-4:30	Kings Co. Extension classroom in Hanford
10/31	9:30-12:30	Sacramento Farm Bureau office in Elk Grove
11/01	9:30-12:30 and 1:30-4:30	Stanislaus Co. Ag Center in Modesto
Follow-up sessions		
11/13	9:30-12:30	Stanislaus Co. Ag Center in Modesto
11/14	9:30-12:30	Merced Co. Extension classroom in Merced
11/15	1:30-4:30	Tulare Co. Extension auditorium in Tulare

To assist producers in complying with these requirements, sample recordkeeping forms have been mailed to each producer. Although you may have already received it, I have included a Preliminary Dairy Facility Assessment Worksheet. This information is due by **December 31, 2007**. By filling out this worksheet you are prepared to complete the report which can be accessed via the internet at the following address:

<http://www.co.merced.ca.us/environmentalhealthwm/>.

The software was developed by Merced County Environmental Health with a grant from the California State Water Resource Control Board. The Central Valley Regional Water Quality Control Board will also have a link to the report on their website very soon, which will be at

[http://www.waterboards.ca.gov/centralvalley/available documents /index.html#confined](http://www.waterboards.ca.gov/centralvalley/available%20documents/index.html#confined).

Users will need an internet provider connection and browser with Adobe PDF Reader software to view the report outputs and an email address. Once connected to the site you must visit the REGISTRATION PAGE to obtain a login and password that will be sent to you via e-mail. A single login and password pair is valid for only one facility. You may request and obtain numerous login/password pairs (as needed). Please read each page completely before entering data or text, instructional lines are red text on user entry screens. Once you have entered the site Home page go to the Preliminary Dairy Facility Assessment (PDF/A) section for further supporting documentation (Information and Computations Documentation).

Look for updates including, but not limited to, links to useful forms, education/technical guidance documents, Waste and Nutrient Management Planning, Nutrient Applications and Record Keeping, Annual Reports and Annual Dairy Facility Assessments.

If you need assistance in filling out any form, feel free to contact myself or your local trade association representative.

.....
The Correlation Between Body Condition Score and Fertility in Lactating Dairy Cows

Ricardo C. Chebel

Veterinary Medicine Cooperative Extension

18830 Road 112, Tulare CA

Body condition score (BCS) is a measure of fat storage. Early in lactation dairy cows mobilize large amounts of body fat to provide energy for milk production because dry matter intake is not sufficient to supply all energy needs. Therefore, it is common for lactating dairy cows to lose body condition during the first 60 days in milk (DIM). The change in BCS from calving to approximately 60 DIM and the BCS at 60 DIM are correlated with fertility. Cows that lose 1.0 or more units of body condition from calving to 60 DIM are less likely to cycle (40.6 vs. 17.9%) and cows that have BCS \leq 2.75 (1 = emaciated, 5 = obese) at 60 DIM are more likely to cycle less than cows with BCS \geq 3.0 (27.0 vs. 14.4%). Furthermore, cows that lose 1.0 or more units of body condition from calving to 60 DIM have smaller pregnancy rates after first postpartum AI compared to those that lose \leq 0.75 unit or those that experience no change in BCS (22.3, 30.7, and 35.6%, respectively). Similarly, those cows with BCS \leq 2.75 at 60 DIM have smaller pregnancy rates following first postpartum AI than those with BCS between 3.0 and 3.75 or those with BCS \geq 4.0 (27.9, 34.6, and 41.8%, respectively). Therefore, to assure good reproductive performance, it is critical to provide cows with fresh feed and water and to avoid overcrowding during the close-up and fresh periods to reduce the extent of BCS loss.

Surviving the Integration of Management of a Dairy and Manure

J.P. Harner¹ J.F. Smith and M.V. Brouk

¹Extension Engineer

Biological and Agricultural Engineering Department

Kansas State University

Manhattan, KS 66506

785-532-2930 / 785-532-6944 (fax) / jharner@ksu.edu

A simple definition of surviving is “the ability to continue to exist”. Many dairies are struggling to exist because they failed to understand or choose to ignore the importance of integrating the management of the dairy and manure operations. Integration is the process of combining or bringing together of operations. Manage is defined as “to be in charge of” or “to control”. Survival in the 21st century will require a unified effort of the management of the various components of a dairy’s operations in a cooperative effort. Integration will necessitate the working together of the nutritionists, veterinarians, crop consultants, manure contractors and others on the dairy. Following are some examples where integration of operations and management will be critical for survival.

Diet and Manure

Dairies recognize the diet is the main input in milk production. The traditional approach has been to formulate diets based on least cost rations. However, comprehensive nutrient management plans (CNMP) are developed based on the excreted manure and urine nutrients. Excess diet nutrients are excreted and impact the CNMP. Least cost diets often result in feeding additional nutrients above the National Research Council minimum recommendations. This increases the manure disposal cost as implemented nutrient management plans move from nitrogen to phosphorus or micro nutrient based land application. Figure 1 shows the potential impact on land requirements of a CNMP. A 1,000 cow dairy with a current nutrient plan utilizing an acre of land per 3 cows, requires about 330 acres of land for manure disposal. If the new plan requires an acre per 2 cows then the land base increases to 500 acres. If an acre per cow is necessary, then the land requirements increase to 1,000 acres. Large dairies within close proximity to each other will be competing for additional available land for manure disposal or be required to invest in technologies to remove nutrients from the manure. Either option will increase operational cost. Long term survival will require understanding the economical impact of least cost diets on the overall dairy finances. Producers need to work with their nutritionist to ensure least cost diets do not require 2 to 3 times as much crop land for

manure application as a diet that is formulated based on the National Research Council's dietary recommendations.

Be a Good Neighbor

Neighborly relationships must be an integral part of the dairy operation. Diaries are currently faced with the challenges being presented by implementation of nutrient management plans. However, the air quality challenges may be the next hurdle to jump as air emissions and particulate matter are another environmental focus. Minimizing the dust emissions from earthen lots will be critical. Balanced rations will minimize the excreted nitrogen and therefore reduce the volatile solids and reduce land requirements for manure disposals. 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-a-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 % 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 is in addition to the urine. Additional water may come from the 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 %. Only 8 g/d/c is required if 60 % of the solids are removed and the acceptable solid contents is 5 %. Table 2 shows the volume entering a containment structure that annually must be pumped per 500 cows. There is a fine balance between integrating properly water conservation practices and ensuring adequate fresh water is added to the system. The tendency 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 \$0.01 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. This reduction affects the manure handling system if the water was an

Table 1 The influence of separator efficiency on the gallons of clean water per cow that must be added daily in order to maintain a desired lagoon solids concentration.

Desired Solids Content in Recycled Water	Separator Efficiency (Percent Total Solids Removed/Moisture Content of Solids)		
	0	30/60*	60/80*
1 %	204	139	78
2 %	95	63	34
3 %	58	37	20
4 %	40	25	12
5 %	29	17	8

* The first number is the percent solid removed while the second number is the moisture content of the solids removed.

Table 2 Comparison of the quantity of material handled from a lagoon per 500 cows assuming 140 lbs of manure per day per cow and various separator efficiencies and desired solids content in the lagoon.

Desired Solids Content in Recycled Water	Separator Efficiency (Percent Total Solids Removed/Moisture Content of Solids)		
	0	30/60*	60/80*
Manure in Lagoon	3,100,000 gal	2,800,000 gal	1,900,000 gal
Material from Separator	0	310,000 gal	1,200,000 gal
1 %	40,500,000 gal	28,100,000 gal	16,100,00 gal
2 %	20,600,000 gal	14,200,000 gal	8,000,000 gal
3 %	13,900,000 gal	9,500,000 gal	5,500,000 gal
4 %	10,600,000 gal	7,300,000 gal	4,000,000 gal
5 %	8,600,000 gal	5,800,000 gal	3,300,000 gal

* The first number is the percent solid removed while the second number is the moisture content of the solids removed.

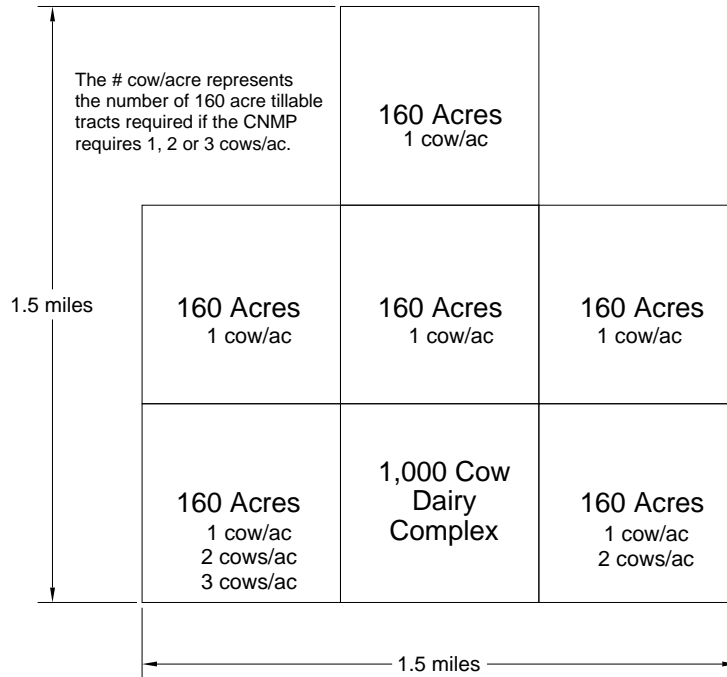


Figure 1 Impact of comprehensive nutrient management plan on land requirements if the land base requirements increase from 1 or 2 acres per cow to 3 acres per cow.

Nonprofit Org.
US Postage
PAID
FRESNO CA 93706
PERMIT #2384

21st Century Dairying

In this Issue

New Central Valley Water
Quality Rules.....1

Complying with the General Order
Where to Begin? Insert

Surviving the Integration of ManagementInsert
of a Dairy and Manure


The Correlation Between Body Condition Score and
Fertility in Lactating Dairy Cows 3

Editor/Author:

G. E. Higginbotham, Ph.D., PAS, DIPL.ACAN

Production Staff:

Terri Gonzalez



Gerald E. Higginbotham, Ph.D.
Dairy Farm Advisor
Fresno/Madera Counties



For special assistance regarding our programs, please contact us.





Facility Information, Existing Condition Report & Preliminary Dairy Facility Assessment Report Completion Worksheet

The purpose of this worksheet is to provide a “fill-in-the-blank” sheet to help gather all of the information that will be needed to complete Central Valley Regional Water Quality Control Board reporting requirements for Existing Milk Cow Dairies, due by December 31, 2007. The reports due must be completed online using specific report completion software. The questions included in this worksheet are laid out in the same order as the question order included in the computer software program to promote faster online report completion.

Dairy or Business Name:

Dairy Address (physical): _____

Street and nearest cross street (if no dairy address): _____

Date Facility Started Operation: _____

Regional Water Board Basin Plan Designation (circle one): Sacramento San Joaquin Tulare

Production Area (barn, corral & pond areas) Assessors Parcel Numbers (000-000-000-000 format):

Legal Property Owner Name: _____

Legal Property Owner Mailing Address: _____

Legal Property Owner Phone Number(s): _____

Legal Operator Name (if different from owner): _____

Legal Operator Mailing Address: _____

Legal Operator Phone Number(s): _____

Land Application Area [owned, rented or leased land where solid manure or process wastewater (manure water) is applied] Assessor Parcel Number(s):

Assessor Parcel Number (APN)

Tile Drainage System (yes/no)

If yes, discharges to?

Cropland Information: (Default values for yield, moisture, protein, and phosphorus will be provided in the computer software if facility-specific numbers are not available.)

Total Acres Planted	Crop Type	Crop Yield (tons/acre)	Crop Moisture Content (%)	Crop Protein Content (%)	Phosphorus (lbs/ton of yield)

Do you apply commercial fertilizers to cropland? Yes / No

If so, estimate the total amount applied (total for all crop types):

Lbs Nitrogen (N): _____

Lbs Phosphorus (P₂O₅): _____

Lbs Potassium (K₂O): _____

Manure Exports:

Manure Type	Volume Exported	Moisture Content	Total Nitrogen	Total Phosphorus
Separator Solids	tons	%	%	%
Corral Solids	tons	%	%	%
Liquid Manure	gallons	XXXXXX	mg/L	mg/L

Information in this document was compiled by CDQAP to assist dairy producers in understanding and complying with the General Order Waste Discharge Requirements for Existing Milk Cow Dairies (Central Valley Regional Water Quality Control Board Order R5-2007-0035). Effort has been made to ensure accuracy, but these summaries are not official regulatory guidance and are not legal advice. Producers are advised that these summaries are not intended to be a substitute for producers reading the complete order and consulting their own legal counsel to ensure compliance with the waste discharge requirements. Should any information here conflict with the General Order and/or official information provided by the Regional Board, Board-provided information takes precedence.

Items to Attach if needed:

1. If completed, Copies of Waste Management Plan and Nutrient Management Plan (as defined by the Waste Discharge Requirements (WDR)).
2. If needed, corrected Report of Waste Discharge turned in on October, 17, 2005.
3. Site Map - a USGS topographic map or aerial photo of your dairy must be submitted with the report (Suggested sources for maps/photos will be provided in later communications).

Are there any groundwater monitoring wells at your dairy? Yes/ No

Have you submitted a monitoring well installation and sampling plan to the Regional Water Quality Control Board? Yes/ No

Is groundwater monitoring being done at your dairy? Yes/ No

Do you provide process wastewater (manure water) to third parties (other farmers)? Yes / No

(If “yes,” you will need to complete written agreements with each one and attach a copy of each agreement with this report when submitted).

Do you have an anaerobic digester? Yes / No

How do you handle mortality (dead stock)? Rendering, burial, other? _____
[Disposal of dairy mortalities (outside of a declared emergency) on site is prohibited by the WDR.]

Was your dairy operating at its current location as of Oct. 17, 2005? Yes / No

Has your dairy expanded (increased number of milking and dry cows) by more than 15% since Oct. 17, 2005? Yes / No

If you expanded by more than 15% since Oct. 17, 2005, did you submit a report of waste discharge (ROWD) to the Regional Water Quality Control Board for the expansion? Yes / No

List all chemicals used on the production area (not cropland) of your dairy that may end up in the waste storage system (lagoon) in the following categories:

1. Disinfectants:

Product Name(s)	Approximate amount used in one year
-----------------	-------------------------------------

2. Footbath Chemicals:

Product Name(s)

Approximate amount used in one year

3. Pesticides:

Product Name(s)

Approximate amount used in one year

4. Soaps:

Product Name(s)

Approximate amount used in one year

5. Other Chemicals:

Product Name(s)

Approximate amount used in one year

How many acres of your dairy are dedicated to the production area (corrals, barns, ponds, feed storage)? _____

Estimate the impervious area (roofed and concrete surfaces) that receives rainfall which drains into the wastewater retention pond(s): _____ acres

How many acres of cropland do you use for manure (both solids and liquid) application? _____

Animal Numbers:

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo.)	Calves (4-6 mo.)	Calves (0-3 mo.)
Number						
Ave. Weight (lbs.)					XXXX	XXXX
Ave. milk production (lb/cow/day)		XXXX	XXXX	XXXX	XXXX	XXXX
Daily Hours on Flush						

Predominant animal breed (largest percentage within the herd): _____

Pond Storage Period desired (options include 120, 150, 180 or 240 days): _____

Average number of milk cows per milking string: _____

Number of milkings per day: _____

Number of times milk tank is emptied per day: _____

Number of hours spent milking each day: _____

Number of cycles used in bulk tank wash and sanitizing (typically 3 or 4): _____

Number of cycles used in pipeline wash and sanitizing (typically 3 or 4): _____

Milkbarn/Parlor Floor Wash

*Default values are available within the Preliminary Dairy Facility Assessment (PDF) Reporting Computer Software for this section if needed. ***Values provided in the software are quite generous as all varied dairy use patterns must be covered with default values. To avoid overestimating your water use and resulting storage needs, it is recommended that individual estimates of water use be utilized using the “user override” option, so that results are better related to your specific operation.*

Type of Milkbarn/parlor floor wash (choose one) Gallons used per day

1. Traditional Automatic Parlor Deck (floor) Flush Valve _____

2. Traditional Manual Parlor Deck (floor) Flush
(manual start flush or red barn hose) _____

3. Continuous Rotary / Carousel Deck Wash _____

Does floor wash water come from re-use of equipment water? Yes / No

How many additional gallons of fresh water are used in manure flush lanes each day? _____

Milking/Cooling Equipment:

Is a well water-cooled plate cooler used? Yes / No

If so, gallons per day usage: _____

