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Agriculture and Natural Resources

California Dairy Newsletter

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In this issue…

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To our readers:

It has come to our attention that the Spanish edition of the California Dairy Newsletter has caused some confusion, and we'd like to take this opportunity to address some of the concerns we've received.

- The Spanish edition is printed one time per year, and our intention is to provide our clientele information they can share with their Spanish-speaking employees.
- Every person who receives the California Dairy Newsletter also receives this Spanish edition.
- The articles that appeared in the Spanish edition were first printed in our quarterly English newsletters. The names of the articles and original publication dates were included on the front page of the newsletter and can be found on the website listed on the front page of each newsletter (cestanislaus.ucdavis.edu). For your convenience, we will reprint the original English article along side the Spanish translation in the future editions of the Spanish newsletter.

If you prefer not to receive the annual Spanish newsletter, please contact your local dairy advisor.

Thank you,

UCCE California Dairy Newsletter Editors

UCCE California Dairy Survey

The University of California Dairy Advisors request your help with our California Dairy Survey. The report has been designed to take less than 10 minutes of your time and is completely voluntary. Your individual response will remain strictly confidential and only be used in summary with similar reports from across the state. Results of this survey will help us better understand and address your needs and the needs of the California dairy industry. We thank you for your time.

http://ucce.ucdavis.edu/survey/survey.cfm?surveynumber=4953

Silage Face Management

Noelia Silva-del-Río, UCCE Tulare County

The goal of silage face management is to minimize silage exposure to oxygen. In the presence of oxygen, yeast can metabolize lactic acid, a strong acid that keeps the silage pH low. When pH increases, undesirable fungi and bacteria are able to grow and further spoil the silage. This spoilage is translated into dry matter (DM) losses that can be as high as 10% when face management is marginal. This article discusses the importance of good face management practices to minimize DM losses and describes current silage management practices in California dairies based on a UCCE survey (Silva-del-Rio et al., 2010).

Maintain a smooth surface: The feedout face should be a smooth surface (with no cracks) and perpendicular to the floor. The advantages of a smooth and perpendicular face are reductions of:

- The surface area exposed to oxygen by up to 9%.
- The risk for avalanches.
- The water caught during the rainy season.

Dairy 1: In this dairy, silage face management is poor. The front loader lifts the silage from the bottom of the pile to the top, allowing oxygen to enter the face.

Dairy 2: This silage face is smooth and perpendicular to the floor. The face is carefully shaved across the width with a front end loader (from left to right as shown in the picture below).

Dairy 3: This dairy uses a face shaver. It is estimated that face shavers can reduce DM losses by 3% compared to front-end loaders. However, more research needs to be conducted.

Based on results from the UCCE corn silage management practices survey, most dairy producers considered that their silage faces were maintained smooth. However, only five of 109 producers used a face shaver.

Maintain a rapid progression through the silage face. The rule of thumb is to remove between 6-12 inches per day during the cold season and 18 inches per day during the warm season. Muck and Huhnke (1995) found that in well packed silages (density = 14 -15 lb DM/ft3) air moves 3 feet into the silage pile. Therefore, with a removal rate of 6 inches per day, the silage will be exposed to oxygen for a week before feeding.

A desirable removal rate can only be achieved if the silage pile is sized according to the herd needs. If the pile's face is oversized, it is recommended to work on removing small sections of the silage face at a time. The removal rate (**Fig 1)** and the width of the face removed in California dairies (**Fig 2**) is represented below.

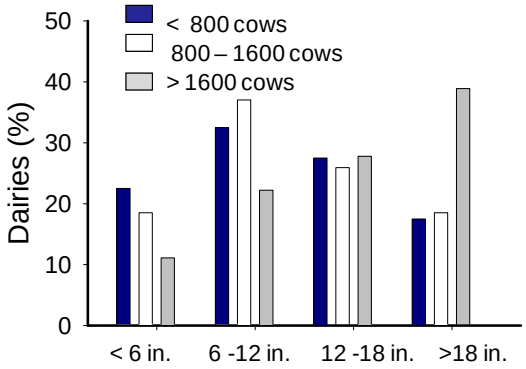

Figure 1. Depth of the corn silage face removed per day by herd size (Silva-del-Rio et al., 2010).

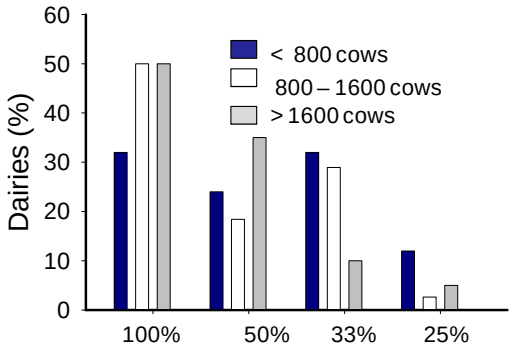

Figure 2. Width of the corn silage face removed per day by herd size (Silva-del-Rio et al., 2010).

Minimize the time loose silage is sitting in the commodity area before it is added to the ration. Silage sitting in the commodity area, exposed to sun and oxygen, heats and undergoes secondary fermentation. In some dairies, the silage may need to be removed several times a day in order to avoid this. There should be little to no silage left at the base of the face after feeding is done for the day (**Fig 3**). Silage should not be removed prior to the time of feeding. This practice may save a small amount of time, but is detrimental to silage quality.

Figure 3. Loose silage sitting at the face exposed to oxygen & air.

Remove the cover as needed, discard spoiled feed and keep air out of the edges and seams. No more than three days of cover should be removed at one time. This will prevent a prolonged silage exposure to oxygen and weather elements. Spoiled and moldy feed should be discarded as it decreases intake, digestibility and destroys the rumen forage mat. A total of 60% of dairy producers reported that they discarded spoiled forage (**Fig 4**). The face should be kept tight to prevent air infiltration. Silage should be sealed on the edges with sand, gravel bags or other materials (**Fig 5**).

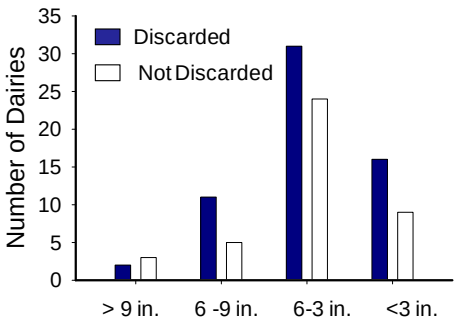

Figure 4. Dairies discarding spoiled forage from the Silage Surface (Silva-del-Río et al., 2010).

Figure 5. Gravel bags on the front and sides of the silage face help to prevent air infiltration into the silage mass.

Back to Basics: Milk Quality – It Starts on the Farm

Ed DePeters, UC Davis & Jennifer Heguy, UCCE Stanislaus & San Joaquin Counties

Milk quality starts on the farm. The processing plant cannot improve the quality of your milk, but can only maintain the quality that you deliver. In a recent article we talked about preparing cows in the milk parlor. In this article, we'll continue the discussion of producing quality milk by explaining your milk laboratory results and highlighting reasonable goals for your dairy.

Quality standards for market milk (Grade A):

Standard plate count (maximum): 50,000 bacteria per milliliter of milk

Laboratory pasteurization count (maximum): 750 bacteria per milliliter of milk

Coliform (maximum): 750 bacteria per milliliter of milk

Somatic cell count (maximum): 600,000 cells per milliliter of milk

What do these standards refer to?

Standard Plate Count (SPC) is a measure of the bacteria present in bulk tank milk. Basically, a sample of milk is plated and the number of colonies counted. It is an estimate of the total aerobic (lives in the presence of oxygen) bacteria. High SPC may indicate inadequate refrigeration, but it is not an indication of udder health (mastitis). ***A goal may be to have a SPC of 5,000 or lower.***

Laboratory Pasteurization Count (LPC) is the cell count of bacteria after a raw milk sample has been lab pasteurized. It is similar to the SPC except the milk is pasteurized. The organisms that survive pasteurization and grow on the plate most often originate from the soil environment. High LPC indicates improper cleaning procedures. Check the cleaning procedures so that there are no residues in the pipeline, traps, and tank. Check the temperature of the wash water during the wash cycle. Check the quality of the soap and cleaning chemicals. Check the cow preparation in the milking parlor so there is no feed, dirt, feces, or other foreign organic material on the teats and udder that will contaminate the milk. Another potential cause of high LPC is long milking shifts. In-line filters should be changed out as appropriate if milking lasts longer than four hours. A high LPC is not an indication of general udder health (mastitis). ***A goal may be a LPC of 100 or less.***

Coliform Count is a measure of the level of sanitation of the cow (teats and udder) and the milking equipment. These bacteria are associated with the fecal environment. In the parlor, check that clean, dry teats are milked. Check to be sure that the wash system is cleaning and disinfecting the surfaces of the milking equipment where milk comes into contact, from the inflations to the pipeline to the bulk tank. A high coliform count does not reflect udder health (mastitis). ***A goal may be a coliform count of 50 or less.***

Somatic Cell Count (SCC) is a measure of udder health. SCC is a measure of all cells in milk. Cells are primarily leukocytes (white blood cells) along with epithelial cells that are sloughed from within the mammary gland. Leukocytes are products of the cow's immune system that move into the mammary gland in response to an inflammation (mastitis). The SCC is a measure of udder health and mastitis. High SCC in the bulk tank is an indication of a problem in the herd. To detect problem cows, milk must

be sampled from individual cows for SCC. Bulk tank milk with high SCC has poor processing qualities and a reduced shelf life at the retail level. ***A goal may be a SCC of 100,000 or less.***

How is the finished dairy product affected by milk quality?
Bulk tank milk is pasteurized at the processing plant or creamery. Pasteurization is the process of heating milk for a predetermined time at a predetermined temperature to destroy pathogens. Pasteurization is based on destroying *Coxiella burnetii* (agent causing Q fever), the most heat resistant organisms of public health concern. Bacteria are killed at a rate that is proportional to the number of bacteria present in milk, meaning milk that is pasteurized is ***not sterile***. The number of bacteria present in pasteurized milk depends on the number of bacteria delivered from the farm to the processing plant. The lower the number of bacteria in the milk from a dairy, the lower the number of organisms present in milk following pasteurization. High quality milk from dairies is necessary to produce the high quality dairy products that consumers demand. Quality milk is also associated with a longer shelf life at the retail level.

Laboratory milk test results provide necessary information to make management decisions on the farm in order to produce high quality milk. Consumers trust that California produces high quality dairy products, and that quality starts on the farm!

Dec 2010 -- Record Rains - Reminders for Complying with Water Quality Requirements

Deanne Meyer, Livestock Waste Management Specialist, Department of Animal Science, UC Davis

With record rainfall in some areas of the Central Valley, it is important for producers to remember the additional monitoring and sampling requirements under the General Order for Existing Milk Cow Dairies. In emergency situations, all effort should be made to prevent manure from leaving the property and entering surface water.

ALL PRODUCERS:
Production Area Inspection (MRP-Table 1). Waste storage areas must be inspected weekly from October 1 to May 31 and monthly from June 1 to September 30. **Waste storage areas also must be inspected during and after each significant storm event.** A significant storm event is defined as "a storm event that results in continuous runoff of storm water for a minimum of one hour, or intermittent runoff for a minimum of three hours, in a 12-hour period." Conditions or changes that could result in discharges to surface water and/or from the property must be noted. It is also necessary to note whether freeboard within each liquid storage structure is less than, equal to, or greater than the minimum required (two feet for above-ground ponds, one foot for below-ground). The Production Area Visual Inspection Form template (CDQAP WDR Reference Binder Document 6.1) on page 2 of this template should be used to document significant storm event inspection.

UN-AUTHORIZED MANURE DISCHARGE EVENTS (ON-FARM OR OFF-FARM):
Discharge Monitoring-Unauthorized discharges (including off-property discharges) of manure or process waste water from the production area or land application area (MRP- Table 3). Samples of materials discharged are required for both on-property and off-property discharges. Unauthorized on-property discharges include application of process waste water to land in excess or outside of applications identified in the Nutrient Budget. Unauthorized discharges require documentation, sampling and reporting to appropriate authorities. Any noncompliance that endangers human health or the environment shall be reported within 24 hours (reporting agencies include RB5, County Environmental

Health & California Office of Emergency Services). A list of reporting agency phone numbers can be found in the CDQAP WDR Reference Binder Document 14.7, Emergency Contact Information. Written documentation should be made using the Regional Water Quality Control Board supplied form titled Priority Reporting of Significant Events (CDQAP WDR Reference Binder Document 6.16). CDQAP WDR Reference Binder Document 8.2, Monitoring Surface Runoff of Manure or Process Wastewater from the Production Area or Land Application Areas notes sampling and reporting requirements.

STORM WATER DISCHARGE EVENTS (FROM PRODUCTION OR LAND APPLICATION AREAS):

Storm Water Discharge Sampling (MRP-Table 3).

Sampling storm water discharges to surface water from the production area. Storm water discharge from the production area to surface water is prohibited unless authorized by a National Pollutant Discharge Elimination System (NPDES) Permit. Under the General Order, *if storm water leaves the production area and enters surface water documentation, sampling and reporting are required.*

Requirements for these events are similar to those for unauthorized discharges of manure or process wastewater. CDQAP WDR Reference Binder Document 8.3, Monitoring Off-Site Discharges of Storm Water from the Production Area or Land Application Areas, notes sampling and reporting requirements. The Priority Reporting of Significant Events form should be used for event documentation.

Sampling storm water discharges to surface water from fields (land application area). *If storm water leaves your property and is able to reach surface water*, the Order requires end-of-field sampling and reporting be done *for two storm water discharges to surface water on approximately one-third of your acreage each year*. The first sampling event is the first significant storm of the wet season. The second sampling event is during the peak storm season. The Order identifies peak storm season to occur typically in February, and that the event is preceded by at least three days of dry weather. Specific sampling and recording requirements for these events are found in CDQAP WDR Reference Binder Document 8.3, Monitoring Off-Site Discharges of Storm Water from the Production Area or Land Application Areas. Documentation for these events should be included as part of the Annual Report.

Dairy Herdsman Short Course

April 26-28, 2011

Consumer Education Pavilion
University of California-Davis Veterinary Medicine Teaching and Research Center
18830 Rd. 112
Tulare, CA

The purpose of the Short Course is to provide the people who do the actual work on the dairy the opportunity to receive information about the latest technology and training in all aspects of dairy management.

Registration fee is $280. Fees for companies and/or dairies with more than one participant will be $280 for the 1st participant and $260 thereafter. Students will be charged $220. No registration at the door will be accepted. **There is translation for Spanish speaking attendees.**

To register on-line and pay by credit card: http://ucanr.org/2011herdsmanshortcourse

For more information contact Gerald Higginbotham, UCCE Dairy Advisor at (559) 456-7558.

Use of Protected Methionine or Lysine in Dairy Rations

Gerald Higginbotham, UCCE Fresno/Madera County

Methionine and lysine are two amino acids which have been suggested to be potentially limiting milk and milk component production by dairy cows. If true, this means that high producing dairy cows need to be fed protein from sources which have both a good amino acid profile and have resistance to degradation by bacteria in the rumen.

Methionine and lysine contents of proteins vary greatly among feeds. Fish meal and by-products produced from cereal grains (including corn), tend to have higher concentrations of methionine and lower lysine than soybean meal and blood meal. However, a high concentration of methionine or lysine in a feed does not ensure that large amounts of it will pass to the small intestine for absorption, because the ruminal bacteria degrade amino acids to different extents.

The degradability (how much is degraded in the rumen) of protein in feeds, along with the amount of protein that is indigestible in feeds, needs to be considered when evaluating feed sources of methionine and lysine. Soybean meal and corn gluten feed tend to supply similar amounts of methionine, and some by-product feeds supply two to five times as much available methionine as soybean meal or canola meal. Relative to lysine, blood meal supplies the most available lysine, soybean and canola meal an intermediate amount, and cereal grain by-products the smallest amount per unit of crude protein.

Several companies that supply feed additives have developed rumen protected forms of methionine and lysine. Such technology makes it possible to augment dairy rations with methionine and lysine in order to provide a desired methionine and lysine balance in the protein that enters the small intestine and is available for absorption. However one must be cautious in assuming responses of cows to ruminally protected forms of amino acids as data are limited (and conflicting) on the dietary conditions under which methionine and/or lysine limit performance of lactating dairy cows.

The milk price will affect the return to feeding a ruminally protected methionine and/or lysine, but producers may see a higher 0.05 to 0.10 % units of fat test with ruminally protected methionine. More research is needed to determine the conditions under which ruminally protected methionine and lysine are needed by California dairy cows. Some groups of cows may respond to ruminally protected methionine, while some may respond to ruminally protected lysine, if they are in fact limiting milk production.

Factors Affecting Feed Conversion and Nitrogen Utilization Efficiency in Dairy Herds

Alejandro R. Castillo, UCCE Merced County

An on-farm survey was carried out on 40 commercial dairy farms in Merced County, California to study the effects of feed and feeding management variables on feed conversion (**FC)** and nitrogen utilization efficiency (**NUE)**. The dairies were selected based on total salt (**TS**) content in drinking water and milk yield (**MY**) per cow. A lineal correlation analysis was used to study the association of different variables related to production efficiency, feed quality, and feed management practices. These variables were: FC, NUE, MY per cow, daily dry mater intake (**DMI**) per cow, total mixed ration (**TMR**) nutrient and mineral content, dietary cation-anion difference (**DCAD**), number of TMRs per farm, number of lactating dairy cows per farm, crude protein balance (**CPB**) estimated by the difference among total crude protein (**CP**) supply & CP required, and water TS content.

Results of the correlation analysis are presented in **Table 1**. Only significant correlations ($r>0.30$ and $P<0.05$) are reported. The table shows those variables with positive and negative effects on FC and NUE. The positive variables were ranked according to the magnitude of "r" and "*P*" values.

Table 1. Ranking of the main variables affecting Feed Conversion (**FC**) and Nitrogen Utilization Efficiency (**NUE**), positive **(+)** and negative **(-)** effects

	FC	Rank	NUE	Rank
Milk Yield per cow	**(+)**	**1st**	**(+)**	**2nd**
FC	**---**	**---**	**(+)**	**1st**
NUE	**(+)**	**2nd**	**---**	**---**
TMR[1]	**(+)**	**3rd**	**(+)**	**4th**
NFC[2]	**(+)**	**4th**	**(+)**	**3rd**
CP[3]	**---**	**---**	**(-)**	**---**
CPB[4]	**(-)**	**---**	**(-)**	**---**
NDF[5]	**(-)**	**---**	**---**	**---**

1. TMR, number of total mixed rations for lactating cows. 2. NFC, non-fiber carbohydrates = 100-(CP+NDF+fat+ash). 3. CP, dietary crude protein content (%). 4. CPB, crude protein balance estimated by the difference among CP supply & CP required according to the NRC, 2001 (grams/cow/day). 5. NDF, dietary neutral detergent fiber content (%).

Summarizing, the three most important variables positively associated with FC and NUE were: milk yield per cow, number of TMR for lactating cows, and dietary energy content as non fiber carbohydrates (**NFC**). Excess CP in the diet negatively affected both, FC and NUE. The dietary %CP and %NDF did have individual negative impacts on NUE and FC, respectively.

Another interesting finding from the study was that water TS content affected the DCAD value. The DCAD estimation should include minerals from the water when TS in drinking water is more than 500 mg per liter. It was estimated in this study that drinking water with a mean of 800±310 mg TS per liter provided on average 7% of calcium, 9% of magnesium, 25% of chloride, 25% of sodium, and 8% of sulfur dairy cow requirements (producing 70 lb of milk per day).

New and Free Dairy Safety Training Guide

North Valley Dairy Day in Orland on February 15th

The Western Center for Agricultural Health and Safety at UC Davis, in collaboration with UC Cooperative Extension's dairy specialists and farm advisors, developed a training guide designed to be used by dairy owners and herdsmen. The free Dairy Safety Training Guide is available in English and Spanish and includes essential background information and resources to conduct brief training sessions on hazard identification and control, machinery safety, animal safety, and planning for emergencies. There will be three events scheduled across California to distribute the Guide and instruct on its use; the first event will take place as part of the UCCE **North Valley Dairy Day in Orland on February 15th**. For more information call Teresa Andrews, at (530) 754-8678.

This effort is part of the Worker Occupational Safety and Health Training and Education Program (WOSHTEP) - an exciting statewide initiative aimed at reducing occupational injuries and illnesses and workers' compensation costs in California workplaces. The program was created under Labor Code Section 6354.7 in 2002 as part of workers' compensation reform. It is coordinated by the Commission on Health and Safety and Workers' Compensation and implemented by resource centers at the Western Center for Agricultural Health and Safety (WCAHS) at UC Davis, the Labor Occupational Health Program at UC Berkeley, and the Labor Occupational Safety and Health Program at UCLA.

Western Dairy Management Conference Meets in Reno in 2011

March 9-11th, 2011

Mark your calendars for the next Western Dairy Management Conference. It will be held in **Reno, March 9-11, 2011**. The program is filled with useful information for dairy owners, managers, and employees. This is the best all around conference in the United States and is right in our backyard. A full list of topics and speakers is available at the conference website http://www.wdmc.org. The Nugget is a great place to get away in March!

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