



DAIRY NOTES

February 2005



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South Valley Dairy Day – Wednesday, February 16th in Tulare

Attached is the schedule for our annual dairy day programs which will be held the week after the Tulare Farm Show. Please join us for this opportunity to get updated on all of the local UCCE dairy research activities and to hear experts share their knowledge of topics important to your business. As usual, the program is free, but since we serve an industry sponsored lunch, it is helpful to have a head count for the caterer, so please call the extension office to let us know if you will attend. The exact same program will be held on the following day in Merced (Mid-Valley Dairy Day), so be sure to tell your dairy friends and family up north not to miss it!

Livestock Emissions Research Update

Scientists convened in Fresno recently to present preliminary results of on-going research regarding air emissions from dairy, beef and poultry operations. The symposium was part of a process to adopt a definition for large confined animal facilities by July 1, 2005 (required by SB 700 – Florez).

Ammonia, methane and other emissions were discussed, but a class of gases called Volatile Organic Compounds (VOC) received most of the attention. VOC's are also referred to as Reactive Organic Gases (ROG). They are a group of about 700 different gases –most react in the atmosphere to form ozone. Each gas has different reactivity. Some form ozone more easily than others. Not all of these gases are associated with animals.

Why the interest in VOC's? The San Joaquin Valley is in a non-attainment area with regards to ozone air quality standards. New regulations require large dairies to obtain air quality permits to control emissions of VOC and dust. Part of the permitting process requires development of air emission inventories for each large dairy facility. Plans for implementing strategies to reduce emissions must also be submitted. VOC emissions from dairies are currently estimated using a questionable factor derived from data published in 1938. The Air Resources Board was directed to review and consider information developed from very recent research conducted during the past several years. The

new studies were the topic of discussion at the symposium. I attended the program and have summarized several important points. For much more detailed and technical information, the presentations from the symposium are available on the ARB website:

<http://www.arb.ca.gov/ag/agadvisory/lersymp.htm>

Several different methods are being employed to estimate air emissions from dairies.

- **analysis of air samples from dairies and use of computer modeling**
- **laser measurements on dairies and use of computer modeling**
- **direct measurements from surfaces on the dairy using flux chambers**
- **direct measurements from cows (and manure) in specially designed chambers**

Each method has advantages and drawbacks. On-farm measurements have the advantage of “real life” conditions, but are confounded by wind speed and direction, ambient weather and other variables that can not be controlled. Computer simulations and modeling can be good depending on how accurate the assumptions they rely upon are at describing real conditions. Flux chambers, devices placed directly on a surface to measure gas emitted, can measure emissions from various surfaces on the dairy such as free stall lanes, corrals, manure piles and silage, but they do not enable one to determine emissions directly from cows. The cow chamber method measures emissions directly from cows and their waste with complete control of ambient “weather” and other conditions. This method is tedious and expensive but enables controlled tests that allow one to compare emissions under different conditions of temperature, humidity, lactation, ration, age/weight of animal or others of interest. No single testing method can accurately account for emissions from all sources on the farm simultaneously so information developed from several may have the most value.

Because of my interest in what is taking place at UC Davis, I will elaborate on that. These studies are a collaborative effort by a team of scientists from UCD,

UC Berkeley, Stanford, Harvard and Iowa State University. Dr. Frank Mitloehner is the project leader. The chambers resemble tiny, enclosed free stall barns with room for three cows each. They have specially designed air inlets and outlets, and all environmental factors including air flow, temperature and humidity are controlled. Sophisticated devices for monitoring air quality in the chambers are employed as well as video monitoring of cows. Videos enable correlation of air quality changes in the chamber with animal behaviors such as defecation and rumination (belching and cud chewing). The cows have stanchion feeders, comfortable beds and space to move about comparable to that found in any commercial dairy free stall barn. They are fed and milked as they would be normally.

Each chamber test takes place over a four-day period. On day 1, the empty chamber is measured. On day 2, three cows are admitted and allowed to adapt to the chamber. On day 3, measurements of the cows and their waste are collected. On day 4, cows are removed and measurements of the waste (without the cows) are collected. Tests have been conducted using dry cows as well as lactating cows. At this point the data is preliminary and studies are continuing, but to summarize from what has been completed at UC Davis:

- Sophisticated methods for measuring air emissions have been developed
- **VOC emissions are lower than the ARB estimate in use**
- Summing up emission factors for each individual VOC does not consider varying reactivity
- **Cows themselves seem to emit more VOC's than their excrement**

The fact that cows emit gas (both ends) is no surprise to those of you who work around them. What may get your attention is the fact that cows can be a greater source than manure, at least for the gases of concern that contribute to ozone, the VOC's.

There was another interesting point made several times from reports of research conducted on real dairies using some of the other methods. **Corrals, feed and animal housing areas seem to be more significant sources of emissions of VOC than manure storage lagoons.** These studies included cows in their measurements. So the on-farm studies suggest that (for VOC's), housing / feeding areas with cows are more significant sources than the lagoon; and the cow chamber studies suggest that cows are more significant sources than their manure. The source of air emissions from a dairy may vary (cow, solid or liquid manure, lagoon or silage sources) depending on whether one is discussing methane,

ammonia or VOC pollutants. Emphasis for controlling air emissions from dairies has focused on manure liquid storage lagoons. The preliminary results suggest a shift in focus will be needed for addressing the VOC's. Instead of forcing expensive technology to reduce emissions from lagoons, there may be opportunities to improve feeding or housing management to reduce emissions from the animals themselves. Housing and cow feeding studies for developing strategies to reduce emissions are under way in controlled studies at UC Davis. Results of those studies will be the topic of future newsletters. Also, **Dr. Mitloehner will provide a research update at the South Valley Dairy Program in Visalia on February 16th. See attached program announcement. Don't miss it!**

**Field Crop Meeting
Thursday, February 24, 2005
Tulare Co. Agricultural Building
4437 South Laspina St, Tulare, CA**

8:30 Registration with program starting at 9:00

Double row cotton results in California

Bob Hutmacher, U.C.C.E. Cotton Specialist

Update in small grains: herbicides, varieties, and rust

Steve Wright, U.C.C.E Farm Advisor

Use of dairy manure for winter forage production

Carol Collar, U.C.C.E Dairy Advisor

Conservation tillage trials in corn

Carol Frate, U.C.C.E Farm Advisor

Update on corn stunt

Charlie Summers U.C. Entomologist, Kearney Ag Center and Carol Frate, U.C.C.E Farm Advisor

Panel on forage sorghums and sudans –

Gene Aksland – Resource Seeds, Jim Kautz – Barkley Seeds and Greg Wittenborn - Lockwood Seeds

NOON - Lunch and adjourn

*PCA (1) and CCA (3) Continuing Education hours
have been requested*

Carol Collar

UCCE Farm Advisor -Dairy & Forages



Dairy Day Programs



University of California Cooperative Extension and Co-Sponsor Allied Dairy Industries of Central California announce the following meetings:

SOUTH VALLEY DAIRY DAY

South Valley Dairy Day
Tulare County Ag Building
4437 S. Laspina, Tulare
Wednesday, February 16, 2005

MID-VALLEY DAIRY DAY

Mid-Valley Dairy Day
Merced County Ag Center
2145 W. Wardrobe Avenue, Merced
Thursday, February 17, 2005

This meeting is free of charge. For more information and making luncheon reservations, call one of the following Cooperative Extension offices:

Fresno County	(559) 456-7285
Madera County	(559) 675-7879
San Joaquin County	(209) 468-2085
Stanislaus County	(209) 525-6800
Kings County	(559) 582-3211 Ext. 2730
Merced County	(209) 385-7403
Tulare County	(559) 685-3303

Program

- 10:00 a.m. UCCE Research Update**
Frank Mitloehner, Ph.D and others
- 11:00 a.m. High Milk Production - Does it Pay?**
*Albert L. Nunes, CPA
Genske, Mulder & Co.*
- 11:30 a.m. CDFA Dairy Activities**
- 12:00 p.m. Lunch**
- 12:45 p.m. Animal Welfare: The Good, the Bad, and the Ugly**
*Carolyn Stull, Ph.D
UCCE Specialist*
- 1:15 p.m. Motivation: The Dairy Owner's Role in Creating a Place Worth Working For**
*Jorge M. Estrada
Leadership Coaching International, Inc.*
- 2:00 p.m. On-Farm Carcass Composting: The Mid-West Experience**
*Tom Glanville, Ph.D
Iowa State University*
- 2:30 p.m. Carcass Composting: The Tulare Experience**
*John Kirk, DVM
UCCE Specialist*
- 2:45 p.m. Calf Raising: Custom vs. Home Grown**
*Jim Reynolds, DVM
VMTRC, Tulare*

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DAIRY POSITION VACANCY

Dairy Program Representative II for Kings/Tulare counties

University of California Cooperative Extension

Salary: \$31,100 + Benefits

Contract appointment ending 12/31/06.

Work under the direction of UCCE farm advisor to support educational and applied research programs for dairy producers and dairy allied industry in Kings and Tulare counties. Assist in development of dairy educational materials; assist in delivery of program information by way of newsletters, web sites, farm visits, field demonstrations, phone calls or meetings; assist farm advisors with field research involving data collection, computer data entry, statistical analysis and summaries; assist in preparation of research reports.


Advanced course work or related experience in dairy animal science, or a closely related field required. Computer, organization, communication skills.

Information available at <http://cekings.ucdavis.edu>

Application available at http://ucce.ucdavis.edu/freeform/cvr/documents/Staff_Personnel1522.doc

Refer to Job 3210-05S Deadline: 3/15/05

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