



University of California Cooperative Extension Kings County

# Dairy Notes

August 2008

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## Tuberculosis Update

During the past 6 to 8 months there has been much conversation among dairy producers at the sales yard, coffee shop, or any place dairymen gather - about bovine tuberculosis. News broke last winter about a TB positive herd in Fresno County, which later was followed by reports of a second positive herd, and finally a third herd. These herds are all under quarantine and disease control plans are being implemented which include removal, euthanasia and necropsy of test positive animals. Specific protocols are followed when TB is identified in a herd, and these are all overseen by the USDA and the California Dept. of Food and Agriculture's Animal Health Branch.

Dairy producers have many questions about this disease - there seems to be a great deal of confusion. Media news stories about the current TB episode have raised awareness and some fear among the general public, who are wondering if their milk and meat is safe. It is important to remind your friends, family and neighbors that the risk of humans becoming infected with bovine TB in California is very, very low. First of all, the actual incidence of TB in our California dairies appears to be exceptionally low. As of early August, more than 105 herds and over 150,000 animals have been TB tested as part of an enormous continuing effort to ensure that herds with some association to the affected herds are not also affected. Despite the tens of thousands of animals that have been tested, the actual number of TB test positive animals is quite low, and those that are confirmed with TB upon necropsy is extremely low. Second, even if there were measurable levels of TB shed in milk, they are killed when milk is pasteurized, and when meat is cooked. In California, nearly all milk sold in stores is pasteurized - if not, it must be clearly labeled as "raw" or unpasteurized. To further reduce the risk of infection, dairy owners and managers should strictly enforce rules that prohibit dairy employees from taking raw bulk tank milk home from the dairy for their families. An interesting study about the changing pattern of human TB in the US was recently published. Information from that study can be found on page 5.

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While the risk of humans contracting bovine TB is extremely low due to the safeguards of milk pasteurization and routine meat inspection, people can contract TB through respiratory exposure to live infected cattle or their carcasses, and through consuming illegal soft cheese products. Conversely, humans infected with bovine TB can transmit disease to cattle, but this is considered very rare. Although the source of infection for the current bovine TB event is still under investigation, it is not believed to have been caused from a human source.

In contrast to low risk for humans 1) becoming infected with TB from cows or 2) causing infection in cows, there is considerable risk of introducing TB into your herd through infected animals. The following recent article, written by Dr. Ricardo Chebel, from the UC VMTRC in Tulare provides details about bovine TB that are important for avoiding infection. In addition, there are several excellent articles on dairy biosecurity that can be found at the UC Davis Veterinary Medicine Extension website.

<http://www.vetmed.ucdavis.edu/vetext/INF-DA.html#B>

Other good information about bovine TB, including updates on the current situation can be found at the CDFA homepage "hot topics" list. <http://www.cdca.ca.gov/>

## Bovine Tuberculosis

*Ricardo C. Chebel, DVM, MPVM, UC Cooperative Extension Dairy Specialist, UC Vet Med Teaching and Research Center, Tulare, CA*

Despite federal and state efforts to eradicate bovine tuberculosis, more than 35 affected herds have been detected in the U.S.A. in the last 5 years. The cause of bovine tuberculosis is *Mycobacterium bovis* (*M. bovis*), which is an organism very similar to the organism that causes human tuberculosis, *Mycobacterium tuberculosis*. Most mammals, including humans, can become infected by *M. bovis*. Among common farm species cattle, goats and swine are very susceptible to this organism, whereas sheep and horses are more resistant.

In most developed countries, active veterinary eradication programs have been able to drastically reduce the occurrence of tuberculosis in cattle, but in many developing countries, bovine tuberculosis is common in cattle and still poses a risk for the animal industry as well as humans that come in close contact with infected animals.

The main source of infection to cattle is other infected cattle, which can shed the bacteria in feces, urine, milk, exhaled air, and discharges from the uterus and skin. The multitude of ways the bacteria can be shed poses a problem for controlling the spread of the disease. Further-

more, it is not uncommon for feed and water to become contaminated with tuberculosis bacteria and become a formidable vector for transmission of the disease to healthy animals. Feeding non-pasteurized contaminated milk to young calves, which are extremely susceptible to infection, creates another great risk for transmitting tuberculosis. Usually the infected animals start to shed the bacteria and infect other animals within 90 days after becoming infected.

The disease is usually characterized by slow chronic loss of weight over several years, despite the fact that infected animals have good appetite and remain alert. Slight cough may occur, but

severe labored breathing and pneumonia are not common. Although milk production is usually not affected, mastitis because of *M. bovis* may occur, but the signs of mastitis caused by *M. bovis* are not different from those of mastitis caused by other bacteria.

In the U.S.A. white-tailed deer, mule deer, elk, bison, goats and sheep are important reservoirs of tuberculosis and can become infected and spread the disease to cattle.

Although people have not been considered important to the spread of tuberculosis to cattle, people can get infected with bovine tuberculosis

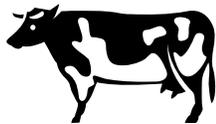
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and shed the bacteria in mucus from the lungs brought up by cough, urine, and exhaled air. Therefore, it is recommended that workers are routinely tested for tuberculosis on pre-employment and during yearly physicals.

As mentioned before, the development of clinical signs due to tuberculosis is slow and animals may not have clinical signs for years after infection while still shedding the organism and infecting other animals in the herd. Also, not testing purchased animals for tuberculosis creates a risk for transmission of tuberculosis as healthy looking animals may be infected and shed *M. bovis* in the new herd. Although most infected animals are detected on routine post mortem examination at slaughterhouses, live animals can be tested for tuberculosis through the tuberculin test.

The keys to avoid infection of your herd with tuberculosis are: educate and train employees, only purchase animals that have tested negative for tuberculosis, adopt good biosecurity practices, and talk to your veterinarian about communicable diseases.

*ACKNOWLEDGEMENTS: Dr. Robert B. Moeller Jr. from the California Animal Health and Food Safety Laboratory, University of California, Tulare, CA.*



## **Dairy got you down? Wake up and smell the endotoxins!**

### ***Study finds reduced lung cancer in dairy farmers***

Despite all the stress of high feed costs, burdensome environmental regulations and a consuming public that just doesn't appreciate you, dairy farming may actually have some health benefits. An interesting study conducted in Italy found reduced lung cancer rates in dairy

farmers. It turns out that there are also plenty of other studies that have shown reduced incidence of lung cancer in farmers compared to the general public. This has usually been attributed to lighter smoking habits, or something called a "healthy worker effect" (with its greater physical demands, an occupation like farming requires a greater demand for good health). The Italian study evaluated clinical records and other information for 1,561 dairy farmers and 722 crop/orchard farmers. They considered number of years worked, size of farm (number of fields), and size of herd. They also considered the influence of age and smoking habits. Compared to the regional population of the area, dairy farmers had a significant decrease in lung cancer while the crop farmers did not. In addition, for dairy farmers, death from lung cancer decreased with increasing length of work, and the risk also decreased with increasing farm land area and herd size.

The authors suggested that endotoxins - airborne particles associated with dust and bacteria may have protected the dairy farmers. Endotoxins are natural compounds, often structural components of certain types of bacteria. They are also potent stimulators of immune cells. Endotoxins can ramp up the activity of macrophages and also B- and T-lymphocytes. These microscopic cells are important soldiers in a sophisticated army that does battle when foreign invaders assault our bodies. How does this happen? Bacteria grow on moist organic materials (think manure). When the organic material dries out, the bacteria die, but the endotoxins remain and become airborne in the dusty environment. Dairy farmers are known to be exposed to higher airborne endotoxin concentrations than other occupations. More years worked, coupled with larger herds and farms, increases cumulative exposure to the protective nature of the endotoxins, accounting for the results found in this study.

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It is impossible to say with certainty whether the findings of this research from small dairy farms in Italy would apply to our very large California dairies. If it does apply, it is more likely that your employees are the ones benefiting from the protection, especially if you as owner or manager spend more time managing the business than doing the hands on day to day chores. Regardless, I for one will stop trying to hold my breath every time I enter the dusty corral to feed my small flock of sheep. And I will definitely stop feeling guilty for making my kids do this chore while they were growing up – in fact some day they may thank me.

#### *Its OK for kids to get dirty*

There is great interest in what has become known as “the hygiene hypothesis”. According to the hygiene hypothesis, exposure to bacteria in the environment help our immune systems to mature. A recently launched study in the European Union will test this hypothesis as it relates to autoimmune diseases and allergies in children.

The EU has allocated 6 million euros to the University of Helsinki for an ambitious project called DIABIMMUNE. Researchers from five countries will study 7000 children in Finland, Estonia and northwestern Russia to learn why Finnish children have type 1 diabetes and allergic symptoms about 5 times more often than children in Russian Karelia. Earlier studies have shown that the occurrence of genes that predispose people to auto immune diseases are approximately equal in both groups of children, so the differences are not due to genetics . It is believed that high living standards, and the life style connected to them may promote development of autoimmune diseases and allergic symptoms. Our immune system may begin to over react to our own body structures, or to noninfectious proteins in the environment (allergens), when it does not have to work hard enough to protect us from real infections.

#### References for Italian study:

*Mastrangelo, G., Marzja V., and Marcer G.: Reduced lung cancer mortality in dairy farmers: is endotoxin exposure the key factor? Am Journal of Industrial Medicine 1996; 30: 601-609.*

*Mastrangelo, G., Marzja V., Milan, G., Fadda, E. Fedeli, U., and Lange, J.H: . An exposure –dependent reduction of lung cancer risk in dairy farmers: A nested case-referent study. Indoor Built Environ 2004; 13:35-43.*

#### Source for DIABIMMUNE study:

*University of Helsinki press release; May 28, 2008; M. Knip.*

## **California Study will focus on dairy employees' respiratory health**

### ***UC scientists assess exposure of workers to dust and ammonia***

Fieldwork began this summer for the California Dairy Environmental Health Research Initiative – a research project funded by the National Institute of Occupational Health and Safety. UCCE Specialist Frank Mitloehner from the Animal Science Dept. at UC Davis is the principal investigator, working with individuals at the UC Davis Medical School's Dept. of Public Health . They are monitoring exposure of 200 dairy workers to evaluate the effect of modern California dairy practices on employee respiratory health. A group of food processing employees who are similar in age, ethnicity and socio-economic status will make up the control group. Several large dairies throughout the San Joaquin Valley are participating. Employees wear a light backpack outfitted with continuous air monitoring devices for one work shift. Before and after their shift, they complete a questionnaire and simple breathing test. Health information like smoking habits and other characteristics is collected. Small stationary samplers are set up to monitor ambient conditions at each dairy. If workers exposed to the dairy environment on a daily basis show no ill effects, researchers will conclude that people living in nearby local communities are not at risk of ill effects from dairy emissions. Results from this project will be compared to a similar study taking place in Colorado. You can learn more about this effort at the project's website:

<http://cal-dehri.ucdavis.edu/>

## Study reveals changing pattern of human tuberculosis in the U.S.

### **Increased incidence of TB strain linked to unpasteurized dairy products**

The incidence of a strain of tuberculosis (TB) called *Mycobacterium bovis*, or *M. bovis*, associated more often with cattle than humans, is increasing in San Diego and is concentrated mostly in Hispanics of Mexican origin, according to a study conducted by researchers at the University of California, San Diego School of Medicine in collaboration with San Diego County public health officials. Their analysis shows that changing patterns of TB in the United States are increasingly being driven by conditions outside of the country, especially in binational communities. The study was published in the June 2008 issue of *Emerging Infectious Diseases*.

Lead author Timothy C. Rodwell, M.D., Ph.D., MPH, associate physician and fellow in the Division of International Health & Cross Cultural Medicine at UC San Diego, and his colleagues analyzed regional data for TB cases in San Diego County obtained from the Tuberculosis Information Management System database maintained by the San Diego County TB Control Program. In their review of 3,291 culture-positive cases of TB covering 1994 to 2005, *M. bovis* was isolated in only eight percent of cases, but the strain accounted for 45 percent of TB cases in children under the age of 15, with almost all *M. bovis* cases from 2001 to 2005 found in persons of Hispanic ethnicity.

"This strain of TB is thought to be primarily spread to humans through consumption of raw dairy products from infected cattle, with only minimal human-to-human contagion," Rodwell said. "Some raw dairy products from Mexico, for instance, unpasteurized cheese like the popular queso fresco, have been found to contain *M. bovis* and should be considered unsafe."

Because of the widespread adoption of pasteurization of all commercially available dairy products in the United States, along with aggressive programs designed to keep dairy cattle in this country free of the disease, the threat of *M. bovis* in U.S. dairy products was largely eliminated in the mid-20th century. The San Diego-Tijuana binational region, however, shares one of the busiest border crossings in the United States with the Mexican state of Baja California, where *M. bovis* is prevalent in cattle and consumption of unpasteurized dairy products is common.

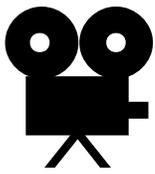
The researchers found that more than 90 percent of *M. bovis* cases in San Diego occurred in Hispanics, most born in Mexico, Rodwell said. He added that collaborations with Mexico on prevention strategies including education and regulation of unpasteurized dairy products, along with elimination of the disease from dairy cattle would be required long term to ensure that this mode of transmission of TB is stopped. "The changing face of TB in San Diego County may reflect a new pattern of the disease in the United States," Rodwell said.

During the period studied, cases of *M. bovis* TB increased at a rate of just over four percent per year, while cases from the more common strain of TB, *M. tuberculosis*, declined. Since *M. bovis* is resistant to one of the four drugs in the standard, six-month course of treatment for TB, treatment for *M. bovis* is usually extended to nine months. While *M. bovis* has been most often documented in Hispanic communities with close proximity to Mexico, the researchers point out that a recent review of such cases in New York City -- also linked to unpasteurized cheese from Mexico -- indicated that the problem is not limited to U.S. regions bordering Mexico.

Additional contributors to the study include senior author Steffanie A. Strathdee, Ph.D., Chief of UC San Diego's Division of International Health & Cross Cultural Medicine; Marisa Moore and Kathleen S. Moser, County of San Diego Health and Human Services; and Stephanie K. Brodine, San Diego State University. The study was funded by the National Institutes of Health, a fellowship from the California HIV/AIDS research program at the University of California, and internal funds from the endowment of the Harold Simon Chair, Division of International Health & Cross-Cultural Medicine at UC San Diego.

Source: U.C. press release, 5/5/08, D. Kain

Reference: T. Rodwell, et al: *Tuberculosis from Mycobacterium bovis in Binational Communities, United States. Emerg Infect Dis. 2008; 14:909-916.*



## Animal Biotechnology: The Movie

The public experience with animal biotechnology often starts and ends with Dolly the sheep, the first mammal ever cloned from an adult cell. The hype that surrounded Dolly rapidly became entangled with the debate over human cloning, and the ensuing discussion failed to elaborate on, or even differentiate between, the broad range of technologies encompassed by the ill-defined term "animal biotechnology". In the absence of information, animal biotechnologies tend to evoke a negative reaction. To address this knowledge deficit and the fact that few general audience educational resources about this topic have been developed by publicly-funded animal scientists, a 30-minute educational movie entitled *Animal Biotechnology* was produced. The movie begins with a brief historical description of the development of various animal biotechnologies and places the most controversial of these technologies, cloning and genetic engineering, within that framework. Both biomedical and agricultural applications of animal biotechnology are discussed, in addition to some of the science-based and ethical concerns that are engendered by certain applications. Excerpts from interviews with leading academic and industry scientists in the field, conducted at the UC Davis Transgenic Animal Conference in 2007, are interspersed throughout the movie. The script and visuals underwent anonymous scientific peer-review prior to release. The target audience for the movie includes college and high school students and interested members of the general public. To make the movie widely available to the general public, it will be posted on [YouTube](#), the UC Davis Animal Biotechnology website, and DVD copies will be made available to educators and other interested parties at scientific and educational meetings. Funding for this project was provided by USDA NRI Grant 2005-55204-15745.

## Rice Straw in Dairy Heifer Rations

*G. Nader, P.H. Robinson, and M. Santos, UC Cooperative Extension Sutter County and UC Davis*

A demonstration study on five dairies in the Kings/Kern/Tulare area showed that the use of a Heston/Lexion cutter baler to put up rice straw, allowed it to be mixed directly out of the bale into a total mixed ration (TMR) and fed at 2-3 pounds/day in dairy replacement heifer diets. Most dairies in the study used it to replace wheat straw as an intake limiter in TMR that were fed free choice to heifers. Managers and feeders on these dairies indicated that there was no increase in mixing time, there was little sorting by the heifers, and they ate the TMR all day.

If you are interested in feeding rice straw, a web site has been designed by the California Rice Commission to market rice straw at

<http://www.ricestrawmarket.org/>

Rice straw producers no longer bale straw in anticipation of sales. Most will take orders from July to September and bale during the harvest (August through October). Many will require a deposit to secure the production of rice straw. Delivery to the dairy should occur in the fall, as many rice producers store the straw out on the rice levees and rain can make shipment difficult. The 2007 delivered costs of rice straw into Tulare and Kern Counties ranged from \$70 to \$78 per ton. For more information, send an email to Peter Robinson at: [phrobinson@ucdavis.edu](mailto:phrobinson@ucdavis.edu) or Glenn Nader at: [ganader@ucdavis.edu](mailto:ganader@ucdavis.edu)



## June Dairy Month "Thanks"

June was National Dairy Month. In Kings County, we celebrated with an old fashioned baseball game and picnic (the Hanford Firemen won again). We recognized the Durbin and Trayce Pedro family as the new Dairy Family of the Year, and we honored Don and Jackie Giacomazzi as the Distinguished Dairy Couple. We crowned 18 year old Haley Hanse as our new Dairy Princess, and we held a poster contest for school children. Mostly we ate a lot of ice cream, drank a lot of milk and had a lot of fun. These time-honored traditions have continued locally for 50 years. It takes a lot of work to keep these events going year after year, but our dedicated Kings County dairy community pulls together to make them happen. Thank you to all the hard working folks who contribute their time for June Dairy Month. Your efforts help to show the "real" side of dairy to an increasingly urban neighborhood

# **Kearney Alfalfa and Forage Field Day**

## **Thursday, September 18, 2008**

*7:30-8:00 AM Registration and Refreshments*

8:00 Variety Trial Tour (Tram available to view plots in the field) - Dan Putnam, UCCE Alfalfa and Forage Specialist, UC Davis

9:15 Alfalfa Irrigation and Deficit Irrigation Strategies - Blake Sanden, UCCE, Kern County

9:35 Alfalfa Insect Control Update - Tulio Macedo, UCCE, Madera and Merced Counties

9:55 Alfalfa Weed Control Update - Kurt Hembree, UCCE, Fresno County

10:15 BREAK

10:30 Vertebrate Pest Management in Alfalfa – Roger Baldwin, UC-IPM, Kearney Ag Center

10:50 When Are P and K Applications in Alfalfa Really Necessary? – Shannon Mueller, UCCE, Fresno County

11:10 Cruiser and Poncho Seed Treatments for Corn Leafhopper Control AND Status of South American Bean Thrips in San Joaquin Valley Alfalfa - Charlie Summers, Entomologist, UC Davis and Kearney Ag Center

11:30 Small Grain Forages, Winter Cereal Variety Update and Weed Control - Steve Wright, UCCE, Tulare and Kings Counties

11:50 Questions, Announcements, Meeting Evaluation

12:00 ADJOURN

For more information, contact Carol Frate at 685-3303

2 Hours of PCA and 3.5 Hours of CCA Credit Approved

### **Driving instructions**

*From Tulare:* Head north on state Highway 99 and exit at the Manning Avenue exit. Go east on Manning for eight miles to Riverbend Avenue. Turn right on Riverbend, and continue one-quarter mile to the Kearney Agricultural Center.



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**Dairy Notes has a fresh new look!  
A list of contents that usually appears in this space can be found on page one.  
Open it up, check it out, and let me know what you think!**

**Regards,**

**Carol Collar  
Farm Advisor  
UC Cooperative Extension—Kings County**