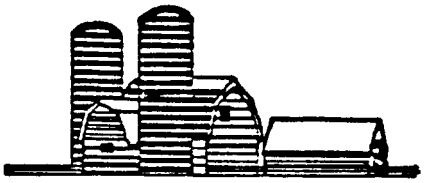
COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

21st Century

Dairying



A dairy newsletter for Fresno and Madera Counties

JANUARY 2004

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

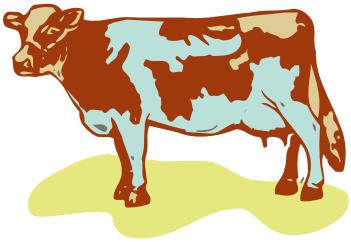
MADERA OFFICE
328 Madera Avenue
Madera, CA 93637
(559) 675-7879
Fax (559) 675-0639

South Valley and Mid-Valley Dairy Days

An agenda for the upcoming University of California Cooperative Extension sponsored South Valley and Mid-Valley Dairy Days is enclosed. Both meetings are free of charge but please RSVP so that we may plan for meeting and lunch arrangements. You may call the Madera County office at (559) 675-7879 or the Fresno County office at (559) 456-7285.

Dairy Herdsman Shortcourse

The next Dairy Herdsman Shortcourse is scheduled to be held May 4-6, 2004 at the Chino Fairgrounds in Chino, Ca. Look for registration materials soon. The course fills up fast so remember to get your registration in as soon as you get the materials.



In This Issue

Recent Regulations Regarding Downer Cows

On December 30th, 2003, USDA's Food Safety Inspection Service (FSIS) took the following actions:
•Downer Animals. Effectively immediately, USDA will ban all downer cattle from the human food chain. USDA will continue its BSE surveillance program.
•Product Holding. USDA Food Safety and Inspection Service inspectors will no longer mark cattle tested under the Bovine Spongiform Encephalopathy (BSE) surveillance program as "inspected and passed" until confirmation is received that the animals have, in fact, tested negative for BSE. This new policy will be in the form of an interpretive rule that will be published in the Federal Register.
Some states have prohibited the sale of downer, or non-ambulatory, cattle for slaughter.

The USDA ban will extend now to all states. Cows that cannot walk onto the trailer are considered non-ambulatory and should be considered for humane euthanasia if the chance of recovery is low. Please have your veterinarian examine the cow to assess its condition and prognosis. If you choose to euthanze the animal, humane euthanasia guidelines may be found at:

The American Association of Bovine Practitioners website:
http://www.aabp.org/euth.pdf

and the University of Florida Extension site:
http://www.vetmed.ufl.edu/lacs/HumaneEuthanasia/pref.htm

Both sets of materials may be printed and the latter is available in Spanish.

Research Update

Effect of Pelleting Whole Cottonseed on Performance of Lactating Dairy Cows

Gerald Higginbotham, Ph.D.[1], Jose Santos, DVM, Ph.D.[2], Ed DePeters, Ph.D.[3] and Leslie Butler, Ph.D.[4]
[1]University of California Cooperative Extension, Fresno/Madera Counties
[2]VMTRC, Tulare
[3]Department of Animal Science, U.C. Davis
[4]Dept. of Agricultural and Resource Economics, U.C. Davis

Whole Cottonseed (WCS) is a common ingredient in rations of lactating dairy cows. Handling characteristics of WCS make it difficult for some dairy producers to utilize. The lint on WCS makes transport in mechanized feeding systems difficult.

Recently a pelleted whole cottonseed product (Fuzzpellet™, Buckeye Company, Memphis, TN) has been introduced to dairy producers in the central valley of California. Due to questions regarding it's usefulness in California dairy operations, we conducted a trial to evaluate the cottonseed product effect on milk production and other parameters.

(Continued on Page 4)

Conditional Waiver/Permitting Plan for Dairies

Deanne Meyer[1] and Barbara Reed[2]
[1]UCCE Livestock Waste Management Specialist, [2]Dairy Advisor, Glenn and Tehama Counties

At the Region 5 Board (RB5) meeting on December 5th, the board indicated that it will have a draft National Pollution Discharge Elimination System (NPDES)/Waste Discharge Requirement (WDR) permit available for public input/comment sometime in early January 2004 and that they hope to have it available for adoption at the March meeting. Remember, the NPDES rules will bring California into compliance with federal regulations, and the WDR will meet state requirements. This has been "under construction" since last year! Hopefully RB5 will come up with something workable so dairy operators don't have to live in limbo. Until there is a new permit, dairy operators are operating without a permit. However, the Regional Board has written a letter of protections that allows dairies to continue to operate until the permitting process is finalized. This letter was distributed directly to dairies in May of 2003. As far as the Confined Animal Feeding Operations (CAFO) rule is concerned--RB5 has until April 13, 2005 to get a permit issued (1 year for the permit and 1 year for public input since we do not require legislative review). All producers will need to comply with the requirements in the CAFO rule by Dec. 2006 (this is develop and implement a nutrient management plan as defined in the CAFO rule).

Things are still progressing slowly on the Certified Nutrient Management Plan (CNMP) side. This is being developed by the Natural Resource Conservation Service with assistance from Cooperative Extension, but is not yet finalized. There was a comparison between the CNMP guidance document and RB5 draft permit from last January. The analysis concluded that the CNMP guidance would not be effective at meeting regulatory requirements. Simply stated, if a person did all of the stuff in the CNMP it would not be enough to meet their legal requirements for their permit. So this will have to stay on the drawing board for some time to come if it is going to be a useful and meaningful tool for dairy operators.

Source: Superior California Dairy Review, December 16, 2003

The study was initiated in January 2003 and was conducted on a local 950-cow dairy. Four pens of cows were utilized which consisted of two pens of first lactation cows and two pens of cows with lactations of two or greater. Each pen was on the study for 42 days and then switched to a different treatment for another 42 days. Treatments consisted of diets containing the WCS or the pelleted whole cottonseed product (PCS). Cows were milked three times daily and housed in an open dry lot with access to shade. All pens were fed a total mixed ration composed of alfalfa hay, corn silage and concentrates.

Milk production and related response are shown in Table 1. Across both parities, feeding PCS tended to increase yields of milk. Compared to cows fed WCS, feeding PCS significantly reduced the concentrations of fat in milk, but it had no effect on milk fat yield. Feeding PCS did increase concentrations and yield of milk true protein.

In summary, replacing WCS with PCS tended to increase milk production, decrease milk fat concentration, and increased the concentration and yield of milk protein. An economic analysis of our results showed that with the exception of low producing cows, feeding PCS is economically superior to feeding WCS. This is due to the higher production of total solids for cows fed PCS.

Table 1. Effect of type of cottonseed on lactation performance of Holstein cows.

	Treatment[1]				
	WCS		PCS		*P*<[2]
Parameter	1st Lact.	2 + Lact.	1st Lact.	2 + Lact.	TRT
Milk, lb/d	68.2	85.4	69.5	87.8	0.07
3.5% FCM, lb/d	64.2	81.0	64.5	81.0	0.98
Milk fat					
%	3.16	3.19	3.07	3.03	0.001
lb/d	2.15	2.72	2.15	2.65	0.15
Milk true protein					
%	2.83	2.78	2.88	2.80	0.03
lb/d	1.92	2.36	1.98	2.44	0.003
Lactose					
%	4.91	4.77	4.90	4.73	0.14
lb/d	3.35	4.07	3.41	4.15	0.14
Solids nonfat					
%	8.71	8.48	8.73	8.45	0.81
lb/d	5.93	7.23	6.06	7.40	0.08
SCC, x 10^3/ml	111.5	206.5	101.7	187.3	-
Linear SCS	2.44	3.19	2.25	3.03	0.12
MUN, mg/dl	14.8	16.8	14.7	16.6	0.46

[1]WCS = whole cottonseed; PCS = pelleted whole cottonseed, [2]TRT=effect of treatment

How to Use DNA-tests in Your Breeding Program

Alison Van Eenennaam, Ph.D.
UC Cooperative Extension Specialist
Animal Genomics and Biotechnology
Department of Animal Science
UC Davis

Dairy producers are familiar with the use of DNA-based tests to determine whether animals are susceptible to certain diseases such as BLAD and DUMPS. DNA for analysis can be extracted from any tissue including blood, hair and semen. The explosion of genetic information and sequence data over the past decade has resulted in the recent availability of some DNA-based tests for production traits such as milk yield. These tests are based on research studies showing that specific DNA variations are associated with a positive effect on production traits such as milk yield. This now makes it possible to consider using "marker-assisted selection" (i.e. accurate selection of a DNA region that has a positive effect on an economically-important trait) in breeding decisions.

A DNA-based test called Igenity‰ L (http://www.igenity.com) based on research out of Canada has recently been released by Merial. This test analyzes a small fragment (one base pair) of the DNA sequence of a gene called Leptin. Leptin (from the Greek *leptos*, meaning thin) is a protein hormone with important effects in regulating body weight, metabolism and reproductive function. Leptin concentrations are low in people and animals with low body fat, and leptin appears to be a significant regulator of reproductive function. Different forms of this gene, called genetic variants, have been reported to have an effect on milk yield and feed intake in dairy cattle, and fat deposition in beef cattle.

Animals can have one of three results or "genotypes" (TT, TC or CC) for the leptin genetic variant that is analyzed in the Igenity‰ L test. There is one published study showing an association between these leptin genotypes and both milk yield and SSC linear score. This Canadian study looked at DHI records from 416 Holstein cows from 11 Saskatchewan herds (mean herd size 71, mean milk yield 67 lb/day). Animals with the TT genotype produced more milk (3.3 lb/day) than animals with the CC genotype. The TC genotype was intermediate (2.0 lb/day). The increase in milk yield was most prominent in the first 100 days of lactation. The TT cows were additionally found to have a significant increase in the SSC linear score. The authors also reported a trend towards a small increase in protein yield (0.09 lb/day) in the TT cows, relative to the CC cows. In this Canadian study the frequency of the T form of the gene in Holsteins was 0.46, suggesting approximately 21% of the animals were TT. No studies examining the gene frequency or milk yield effect of these leptin genotypes in the US dairy population have been reported. The cost of the test is ~$60/animal and it requires the collection of a hair sample (including the root bulb) from animals that are to be tested. The website for the supplier of the Igenity‰ L test is http://www.igenity.com.

It is important to realize that DNA-based tests for complex traits like milk yield are associated with only one of the many genes that contribute towards milk production. The presence or absence of the numerous other "unmarked" genes and the production environment will determine whether an animal actually makes more milk. Even in the presence of marker data, PTAs (predicted transmitting ability) should still be an integral component of selection decisions as they estimate the breeding value of all the "unmarked" genes that contribute to a given trait. Marker-assisted selection should be seen as a tool to assist with, and not as a replacement for, traditional selection techniques based on PTAs and Net Merit. Of course DNA-based tests are not a silver bullet, and in the end only a good production environment and management will allow a genetically-superior animal to live up to her genetic potential and produce more milk.

No-Growth Milk Culture Results

John H. Kirk, DVM, MPVM
Extension Veterinarian
School of Veterinary Medicine
University of California Davis
Tulare, CA

After your herd veterinarian talked you into taking some milk samples for culture in hopes of finding out what bacteria was causing your mastitis problem, you are disappointed to get back several culture results reporting "No growth" or simply NG. You wonder how this can happen when the milk samples were collected from the cows soon after the cows were noticed by the milkers to have abnormal milk. Here are some of the reasons for NG.

According to Philpot and Nickerson in their book, Winning the Fight Against Mastitis, you can expect that about 30% of the milk samples taken from cows with clinical cases of mastitis or with elevated somatic cell counts will come back as NG. They suggest that in chronic coliform infections the numbers of bacteria shed in the milk may be below the detection limit of the routine laboratory culture techniques. In other cases, the laboratory methods may not detect a particular type of organism such as Mycoplasma that require specialized methods for detection. In other cases with high cell counts, the mammary gland may have already cleared the pathogen and all that remains are the somatic cells attempting to heal the injured tissues in the gland.

In herds where clinical infections with coliform bacteria are common, the percentage of NG culture results may be between 30-50%. With coliform mastitis, the mammary gland defenses, mainly the somatic cells, usually do a good cleaning up the coliform bacteria within 8-12 hours. So that in 2x milking herds, if the infection starts soon after one milking, there may be few bacteria left to detect by the next milking even though the milk may look terrible and the cows is very sick. Herds milking 3x or 4x should have a lower percentage of NG from coliforms due to the shorter interval between milkings.

With the contagious bacterial pathogens that often produce chronic infections lasting for many months, it is also possible to get NG. This may be due to intermittent shedding patterns and sampling frequency. As an example, with chronic Staphylococcus aureus infections, a single quarter sample will not detect the infection about 25% of the time. If two samples are taken on consecutive milkings, only 6% of the infections would be missed. Three samples would reduce the reports of NG to only 2%. The problem here is to take the milk sample when the bacteria are being shed in sufficient numbers to be detected by the routine laboratory techniques.

Another possibility is that bacteria in the milk sample are lost during storage. Most laboratories suggest that the samples be kept on crushed ice when they are to be delivered to the laboratory within 4-6 hours after collection. When the samples are to be delivered to the laboratory before 24 hours, they can be store in a refrigerator. Samples to be held on the dairy for more than 24 hours should be frozen at a constant temperature. The problem is that many home freezers do not maintain a constant temperature. Frost free freezer compartments routinely vary the temperature to remove the frost. This variation in temperature is especially harmful for the coliform bacteria. However, in some cases, it actually might increase the likelihood for detection of Staphs or Streps.

Here are some suggestions to minimize the number of NG reports from the laboratory:

1. Train your milkers to detect clinical cases of mastitis. Let them know why it is important to collect milk samples at the very first instance of abnormal milk. This is particularly important in 2x milking herds.
2. To optimize the detection of contagious pathogens, particularly when attempting to detect subclinical infections in high somatic cell count cows, it is necessary to collect more than one milk samples for culture. The urgency of total detection will dictate whether 2, 3 or even 4 samples should be taken.

(Continued on Page 7)

3. Deliver the milk samples to the laboratory soon (4-6) after collection and keep them in crushed ice until they reach the laboratory.
4. If milk samples are to be frozen, try to limit the storage time in the freezer to less than one week.

Even when all your collection, storage and deliver strategies have been properly accomplished, there may still be up to 30% of the samples that are reported NG. Depending on the clinical signs on your dairy and previous culture results, you may be justified in concluding that these cases were due to coliforms in most of the NG cases. Your herd veterinarian can help you optimize your mastitis culturing program.

Treating Scouring Calves with Banamine

John H. Kirk, DVM, MPVM
Extension Veterinarian
School of Veterinary Medicine
University of California Davis
Tulare, CA

A USDA report indicated that by the fifth week of life, greater than 25% of dairy calves had been treated for diarrhea, also known as scours. In this report, dairy producers thought scours caused more than 50% of the calf deaths in heifer calves being raised as replacement animals.

Many different approaches have been suggested for the treatment of calves with diarrhea. The treatments most often include antibiotics by various routes of administration along with supportive fluids given orally or intravenously. A recent report suggests that under certain circumstances the use of Banamine (flunixin meglumine) may reduce the number of days of sickness. This drug is used in most instances to reduce fever and inflammation.

Holstein bull calves were used in the study that was carried out on a commercial California calf ranch. During the study, 115 calves 1-21 days of age were enrolled in the study. At the first sign of diarrhea, one third of the calves received no banamine; one third got a single dose of banamine (1 mg/lb body weight); and one third got 2 doses 24 hours apart. The banamine was given intramuscularly. Assignment to treatment groups was made on a random basis. Calves were evaluated daily for rectal temperature, fecal consistency, attitude and skin elasticity through their first 21 days on the calf ranch. The days of sickness were also recorded.

Results of the study showed that calves that had blood in their scours benefited from a single dose of banamine given at the first sign of diarrhea. Calves treated in this manner had fewer sick days and received fewer antibiotic treatments compared to the non-treated or twice-treated calves with blood in their feces. Calves without blood in their scours did not benefit from banamine treatment. All calves with diarrhea were also treated by the ranch personnel using various antibiotics. No attempt was made to determine the infectious cause of the diarrhea.

Calf diarrhea continues to be a major cause of sickness and death in milk fed dairy calves. This report suggests that treatment with banamine along with other therapies under the conditions of this study may be expected to reduce the impact of diarrhea. As with other treatment strategies, it is always a good idea to consult with your dairy veterinarian before you begin a new treatment regime.

(Barnett SC, Sischo WM, Moore DA, et al. 2003 Evaluation of flunixin meglumine as an adjunct treatment for diarrhea in dairy calves. JAVMA 223; 1329-33)

UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION
County of Fresno
1720 South Maple Avenue
Fresno, CA 93702

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

In This Issue

For special assistance regarding our programs, please contact us.

21ST CENTURY DAIRYING

Production Staff:
Shannon Spencer

Editor/Author:
G. E. Higginbotham, Ph.D., PAS, DIPL. ACAN

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