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California Dairy Newsletter

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UC COOPERATIVE EXTENSION TO CELEBRATE 100 YEARS

This year, the University of California is celebrating the 100th anniversary of Cooperative Extension. Part of the UC Division of Agriculture and Natural Resources, UC Cooperative Extension is made up of advisors, staff and specialists who, like their counterparts in other states nationwide, bring university knowledge to farmers and families to enhance their health, their business and the environment.

"For the past century, UC Cooperative Extension specialists and advisors have been educating Californians in their communities, at their places of work, and even sometimes at their own homes," said Barbara Allen-Diaz, UC vice president for Agriculture and Natural Resources. "UC Cooperative Extension's network of researchers and educators continue to work with Californians to address local issues and use science to solve problems."

For more information about UC Cooperative Extension, visit http://ucanr.edu/sites/100years.

AVOIDING DRUG RESIDUES

Betsy Karle, UCCE Glenn & Tehama Counties

While cull cows and bull calves aren't the primary source of income on dairies, they are a significant source of drug residue violations, and have regulatory agencies looking for solutions. A recently accessed "repeat residue violator information system report" was dominated by bob-veal and dairy cow residues including neomycin, penicillin, flunixin, sulfadimethoxine, tulathromycin, and desfuroylceftiofur. Here are some points to help your dairy stay off the residue list.

Any deviation in labeled **dose, route, rate, duration,** or **indication** of any drug constitutes extra-label drug use (ELDU) and must be specifically recommended by your herd veterinarian. There is certainly a place for ELDU, but it's important to note that labeled withdrawal times no longer apply whenever these changes are made. Penicillin is a classic example- the bottle label hasn't been changed for years, but veterinarians routinely prescribe a different dose to increase effectiveness. Be sure you have a label from your vet with the appropriate information, especially the re-calculated withdrawal time. Re-visit your employee training programs to ensure that individuals responsible for medicating animals are comfortable giving injections via all routes - subcutaneous, intramuscular, and intravenous. For example, an injection of the pain-reliever flunixin given in the muscle or under the skin instead of IV, as indicated in the label, will **increase the withdrawal time by weeks**.

Calves sold at a day or two old are another significant source of drug residues. If these calves are fed colostrum with dry-treatment antibiotic residue or medicated milk replacer, they may end up with a tissue residue if harvested before the withdrawal time has passed. Be sure your calf buyer knows if your bull calves have been fed anything that needs to clear their system before harvest.

Don't forget that things change. For example, the residue test for dexamethasone, which is violative at any level, has become much more sensitive, lowering the detectable concentration. The extra label use of cephalosporins has been restricted, making any ELDU a violation. Labels also change- Excenel® RTU EZ, for example, is a new formulation that now has a 4 day slaughter withdrawal. Records and protocols need to be updated when these changes occur.

As with so many other details, good records are vital. Shipping a cow before her withdrawal time has passed is not worth the risk and can be avoided with good records. Emphasize the importance of recording all treatments to avoid any miscommunication and be clear about the significance of cull cows to the food supply.

Additional, detailed resources and training materials in English and Spanish are available at the following websites:
http://dairybeef.ucdavis.edu/home.htm
http://www.nationaldairyfarm.com/residue-prevention.html

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

MANAGING NUTRIENTS WITHOUT WATER

Deanne Meyer, Ph.D. CE Livestock Waste Management Specialist, UC Davis

It's March and the winter rains never quite made it to California. Certainly, the snow didn't come at high enough quantities. Right now we're looking at some tough decisions for dairy operators with respect to forage management.

Decisions are limited and hardest in areas where water hauling for animal consumption has already begun. USDA Natural Resources Conservation Service and the Farm Service Agency (FSA) have had emergency funds available for drought management (due in March) and FSA has a program opening mid-April for pasture losses (see page 1 article).

Winter forage---looking at the crop in the valley it's probably light. Recent rains are good if they haven't lodged the crop. In areas where lodging has occurred, perhaps a skilled individual at the chopper will be successful in removing forage. As of mid-March the value of current winter forage crop in the field was inching over $50/ton.

Summer crop---Drought impact to operators will be a function of water availability. For operators using wells, perhaps they need to drill deeper for water (common in S. Valley) therefore increasing costs of production ($75/ton already projected for corn).

For operators using District water, impact of drought will be a function of water allocation. I've heard numbers up to 60% reduction in acreage planted. Some Districts will provide a given amount of water per month. Depending on availability of well water, producers may opt for longer season corn, and fewer acres.

Some Districts will offer a fixed amount of water—delivered upon request. Operators in these areas may opt for shorter season corn, and attempt to plant early to take advantage of any lingering moisture/potential late spring moisture. The trade-off may be lower yield.

Producers who receive water through the Federal system are getting a trickle of an allocation. One operator indicated he'd plant 20% of his land receiving that water and go with forage sorghum.

Attention to nutrient management must still occur even with fewer forage acres planted and potentially lower yield. **Adjust pond water applications (reduce) if yield expectations are reduced.** Remember to consult with your agronomist to be sure the appropriate quantity of nutrients is applied. **Prioritize and keep land in production if it can utilize liquid manure….DO NOT OVER APPLY LIQUID MANURE.** Remember to **sample solid manure when it is moved off the dairy. Sample the pond more frequently** if you have less dilution water coming in due to less irrigation water. You don't want to burn crops with too much nitrogen or salt due to concentrated water.

In the good news department, there's no shortage of seed available for the summer plantings. Unfortunately, that's because fewer acres will be planted.

The more things change the more they stay the same. As always, for GOOD nutrition, have diets formulated to meet nutrient and fiber needs of animals. Finding effective fiber and energy in diets come late summer through next year may be a challenge. My crystal ball says that there won't be an almond hull in the state that isn't spoken for…. Questions? Concerns? Comments? Email me at dmeyer@ucdavis.edu

FEDERAL FUNDS AVAILABLE FOR DROUGHT ASSISTANCE

Deanne Meyer, Ph.D., CE Livestock Waste Management Specialist

Drought information is available through the www.cdrf.org website.

By April, 2014 both NRCS and FSA would have already had deadlines for applications to assist livestock producers with drought expenses. Yet another program will open in mid-April with FSA for the Livestock Forage Disaster Program. It is now a permanent program with compensation to **eligible livestock producers who have suffered grazing losses** due to drought or fire. An eligible livestock producer that owns or leases grazing land or pastureland physically located in a county rated by the U.S. Drought Monitor (http://droughtmonitor.unl.edu/) as having a:

D2 (severe drought) in a county for eight consecutive weeks or more during the normal grazing period: assistance equals one monthly payment;
D3 (extreme drought) in a county anytime during the normal grazing period: assistance equals three monthly payments;
D3 (extreme drought) in a county for four weeks or more during the normal grazing period or D4 (exceptional drought) anytime during the normal grazing period: assistance equals four monthly payments;
D4 (exceptional drought) in a county for four weeks (consecutive weeks unnecessary) during the normal grazing period: assistance equals five monthly payments.

SORGHUM - DROUGHT YEAR FORAGE OF CHOICE?

UCCE field trials evaluate yield, agronomic traits, water use and nutritional quality

Carol Collar, UCCE Kings County and Peter Robinson, Ph.D., CE Dairy Nutrition Specialist

California forage growers and dairy producers are facing tough choices this season regarding forage production. With little to no surface water, and uncertain water supply from existing wells, planting corn for silage may not be an option. Among summer annual forages, corn is valued for superior yields of high energy silage for dairy cows. But corn also requires much higher water and nutrient inputs.

So, what about sorghum? Sorghum for silage production falls into three main categories: grain sorghum (milo), forage sorghum, and sorghum-sudangrass hybrids. Of the three types, forage sorghums are most commonly used for silage. There are many different varieties of forage sorghum, each with specific attributes, including conventional, Brown Mid-Rib (BMR), photoperiod sensitive and brachytic dwarf with or without the BMR trait. The water savings potential and nutritional attributes of forage sorghums have been studied extensively in the Texas panhandle. That research has shown forage sorghums can produce silage yields similar to corn, with adequate nutritional quality, while using 30% less water. This suggests sorghum is a crop with promise in the parched San Joaquin Valley. To help growers and dairy producers assess the potential value of sorghum, UC advisors and specialists have conducted field trials in recent years.

What are the differences between sorghum types, and how do they compare to corn silage? Selecting grain type sorghum, which has a much bigger and heavier grain head compared to a forage type, could potentially boost the energy value of the resulting silage without sacrificing yield/acre. We investigated this possibility in a field trial on a commercial dairy with the objective of comparing yield and nutritive value of a grain type and a forage type sorghum. Following is a brief summary of the results. A more detailed report can be found at: http://sorghum.ucanr.edu/

Yield - At harvest, the forage sorghum was taller, and produced 25% higher yields than the grain sorghum (Table 1). Both the grain and forage sorghum had lower yields relative to average values for corn silages grown in the area.

Table 1. Relative Yields of Forage and Grain Type Sorghums and Irrigation Events compared to Corn Silage

Type	Brand	Plant Height (ft)	% DM at harvest	Tons/Acre at 30% DM	No. of Irrigations (planting to harvest)
Grain	HyTest 850	5.3	28.9	22.8	3
Forage	SorgoMax FS 403	8.6	26.2	28.4	3
Corn silage	Average values	12.5	32.0	30.0	8

Nutrient profile - The grain type sorghum had a lower level of structural fiber and a sharply higher level of starch, compared to the forage type, as would be expected due to its larger seed head (Table 2). The grain type nutrient profile was similar to corn silages grown in the San Joaquin Valley.

Table 2. Chemical Composition of Sorghums and Corn Silage on 100% Dry Matter Basis

Type	Brand	ADF	NDF	Lignin	CP	Starch
Grain	HyTest 850	29.1	45.7	7.6	9.1	23.1
Forage	SorgoMax FS 403	32.3	49.1	8.0	8.6	16.8
Corn silage	Average values	30.8	48.0	2.9	7.9	25.0

Notes: ADF and NDF are measures of the amount of structural fiber in plants. Lignin is an indigestible part of structural fiber which is in both ADF and NDF. Structural fiber is only partly digested by cattle, and only in the rumen. CP is a measure of protein level of the plant material whereas starch is essentially fully digested by the cattle in either the rumen or small intestines.

Digestibility **-**While the *in vitro* estimate of fiber digestion ($dNDF_{30}$) did not differ between sorghum types (Table 3), the values were sharply lower than for corn silages and this is reflected in the much lower estimates of net energy (NEl) of both sorghums *versus* corn silage. This difference, especially for the grain sorghum which had a similar gross nutrient profile as corn silage, is partly due to the lower digestion of fiber, but likely also reflects the small sorghum seeds, many of which will escape crushing during harvest, as well as not be fully digested by cattle. Thus more sorghum starch will appear in feces than from corn silage with its larger kernel size.

Table 3. *In vitro* Digestibility and Fermentation, as well as Calculated Energy Values of Sorghums and Corn Silage

Type	Brand	$dNDF_{30}$ (% of NDF)	Gas-4h (ml/g DM)	Gas-24h (ml/g DM)	NEl based on 24 h gas (Mcal/lb DM)	NEl based on $dNDF_{30}$ (Mcal/lb DM)	TDN (% of DM)
Grain	HyTest 850	30.1	5	256	0.59	0.56	63
Forage	SorgoMax FS 403	31.8	11	256	0.56	0.54	61
Corn silage	Average values	48.0	61	229	0.67	0.65	69

Notes: $dNDF_{30}$ is a bench top estimate of the digestibility of NDF in the rumen of high producing dairy cows. Gas produced at 4 h using a bench top technique reflects the digestion of the most rapidly digested fractions of the plant whereas that at 24 h is a reflection of the digestibility of DM in the rumen of high producing dairy cows. NE can be calculated from both dNDF30 as well as 24 h gas, and both are shown here. The TDN (total digestible nutrients) values allow a quick comparison to the values of alfalfa hays.

What sorghum type is best to replace corn silage for lactating dairy cows - grain or forage? The energy value of the forage variety was lower than for the grain variety, but the difference was very small and is unlikely to be of sufficient magnitude to overcome the sharply higher yield of the forage variety. High yield will be particularly important in the current drought conditions when all feeds will be at a premium. However this forage sorghum had a much poorer nutrient profile than did corn silage, and feeders can expect lower intakes of TMR and lower animal performance when it is substituted for corn silage unless compensatory changes are made in the ration formulation. We evaluated only one conventional variety of forage sorghum in this trial. Among the many commercially available forage sorghums, there is enormous diversity. To see how other sorghums performed in UC field trials, visit the UC ANR sorghum website: http://sorghum.ucanr.edu/. There you will find forage data and production manuals for both grain and forage sorghum.

Consider drought tolerance – From planting (July 3) to harvest (Oct 18), only three irrigations were applied to the sorghum in this field trial. Corn in the surrounding areas would require 8 to 10 irrigations. Where water is limited, or if there is a desire to conserve or reallocate available water, forage sorghum may be a viable alternative to corn silage.

UTERINE INFECTIONS IN DAIRY CATTLE

Patricia Blanchard, DVM, PhD, California Animal Health and Food Safety Laboratory

In the past 6 months, the California Animal Health and Food Safety Laboratory (CAHFS) has been validating a rapid test (PCR) to detect bovine herpesvirus- 4 (BHV-4) in cattle. Validation of a new test requires testing at least 30 positive and 30 negative diagnostic submissions from different animals and confirming by another method whether the virus is truly present or not. For this virus, validation testing has been performed on uterine fluids from cows with uterine infections that were collected by a veterinarian during a herd check or by CAHFS during a necropsy at the laboratory. BHV-4 is not considered a primary cause of uterine infections and the virus can also be carried by healthy animals. However, stress, corticosteroid use and inflammation from bacterial uterine infections activate the virus to replicate, leading to more severe damage of the endometrium. This co-infection of the uterus by various bacteria and BHV-4 causes more severe uterine infections that are less responsive to treatment.

All uterine infections with BHV-4 detected at CAHFS also had several types of bacteria that are commonly found in cases of metritis. The more severe cases also had large numbers of mixed anaerobic bacteria. Four herds reported an increased frequency and/or severity of postpartum metritis with some deaths in first calf heifers. In these herds, BHV-4 was found in uterine fluids of some affected heifers and we also tested for other viruses that could damage the uterus directly such as Bovine herpesvirus-1 (BHV-1 aka Infectious Bovine Rhinotracheitis (IBR)) or suppress the immune response such as Bovine viral diarrhea virus (BVDV). In one herd, co-infections with BHV-4 and BHV-1 (IBR) were detected in the uterine fluid and on two dairies, co-infections with BHV-4 and BVDV were found. BVDV was also found causing vessel damage in multiple organs and laryngitis in several heifers without BHV-4 virus in their uterus from one of the co-infected BVDV and BHV-4 dairies.

Though vaccines for BHV-4 are not available, a good vaccine program for BVDV and IBR can prevent postpartum heifer infections with these two viruses. BVDV and IBR infections among lactating cows are most often commonly seen in first calf heifers within the first 2 weeks of freshening. BVDV infection at this age may result in scruffy skin, diarrhea, straining to defecate, metritis, laryngitis, pneumonia, poor doing animals and rarely oral ulcers. IBR results in pneumonia and rhinotracheitis as well as vulvovaginitis with bright red vaginal mucosa that has small vesicles that rupture and form ulcers. IBR and BVDV in postpartum heifers is probably due to a combination of inadequate vaccination, ideally pre-breeding, and, in the case of BVDV, lack of exposure to the strains circulating in the cow herd. Gaps in vaccine programs for first calf heifers occur when BVDV vaccination is only given at dry off and postpartum check and to calves less than 8 months of age when maternal antibodies from colostrum may prevent good vaccine-induced immunity.

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