

Scouring Calves: Treatment Starts with Fluids!

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In the US, scours are the most prevalent health disorder of pre-weaned dairy calves (25%) and are also the leading cause of mortality. Most scours occur after the gut lining is invaded by infectious agents (viruses, bacteria, or parasites) that destroy or impair function. Scouring calves lose water, key electrolytes (salt), and bicarbonate in their feces. Calves older than one week may have an overgrowth of gut *E. Coli* that ferments nutrients, causing an increase in lactic acid which may lead to increased cases of systemic acidosis.

Most deaths associated with scours are attributed to dehydration and acidosis. Regardless of the infectious agent and the severity of the case, start treatment of scouring calves by restoring hydration, electrolytes and acid-base balance with **FLUIDS**. Based on a recent nationwide survey, antimicrobials are often used to treat scours (80% of affected calves are treated), but there is limited information on how often fluid therapy is provided to scouring calves.

Scouring calves that seem healthy (normal appetite, attitude, and temperature) **do not require antimicrobials**, but they must be given oral rehydration solutions to replace the water and electrolytes lost. Provide fluids in addition to (**not instead of**) their regularly scheduled milk feedings. Milk feedings provide the nutrients (energy) required to recover. Numerous types of oral rehydration solutions are available. Most treatments combine electrolytes with other agents that: a) facilitate sodium and water absorption, b) have alkalizing properties or c) provide energy (milk feedings still required). Seek guidance from your veterinarian to select the best oral rehydration solution and to design treatment protocols (i.e. method of administration, the amount given, timing and frequency) based on the severity of dehydration and acidosis.

Before starting oral rehydration in **scouring healthy** calves, consider the following:

- Oral rehydration solutions can be administered with a bucket or bottle, but the calf must be willing and able to suckle.
- In mild cases where suckling is weak, electrolytes should be given with an esophageal feeder. See information on severe cases below.
- Feed electrolytes one to four hours after scheduled feedings to maintain calves' appetite for milk.
- Oral rehydration solution powder must be measured according to the label and mixed with the recommended amount of water (not with milk or milk replacer).
 - Mixing electrolytes with milk or milk replacer will increase its osmolality. Solutions with high osmolality may slow abomasal emptying and cause bloat.
 - Mixing milk with electrolyte solutions that include alkalizing agents could prevent curd formation in the calf's stomach.
- Electrolyte solutions rich in alkalizing agents or high in Na⁺ (sodium) can help acidotic calves, but if given for too long after the acidosis has been corrected, it may drive calves into alkalosis.

Severely dehydrated or acidotic calves require immediate veterinary assistance, as fluid therapy should be administered intravenously. In severe cases, antimicrobial therapy is recommended after fluid therapy. Consult your veterinarian to develop protocols for the diagnosis and treatment of scours. **Remember, fluid therapy should be the first treatment approach for scouring calves.**

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Heat Stress During the Dry Period Affects Multiple Generations – Keep Your Dry Cows Cool

Fernanda C. Ferreira - UCCE Herd Health & Management Economist Specialist

We all know that **heat stress** negatively affects lactating cows, which leads to reduced dry matter intake, a drop in milk production, impaired reproduction, and increased culling. Estimated heat stress losses during the **lactating period** are **over \$1 billion** in the US, making heat stress the costliest problem that dairy farmers face during the summer. Although many farmers cool their lactating cows during periods of heat stress, dry cow cooling is often ignored. We recently calculated the losses associated with **heat stress in dry cows** in the US, which can reach up to **\$810 million** (this number might be underestimated). Losses are due to decreased milk production in the next lactation. In Florida, cows exposed to heat stress during the dry period produce an average of 11 pounds less milk per day throughout the entire subsequent lactation when compared to cows under shade and evaporative cooling. Additionally, research has shown that these negative effects are transgenerational and negatively affect the survivability, productive life, and milk production of heifers (and their daughters!) born from dams that were heat stressed during the dry period. We looked at data from 10 years of dry cow heat stress studies in Florida and our research has shown that heifers born from dams under dry period heat stress produce 5.5, 5.5, and 12 pounds less daily milk in their first, second, and third lactations (respectively), and they leave the herd 9.8 months earlier, on average, when compared to heifers born from dams cooled during the dry period.

What about California?

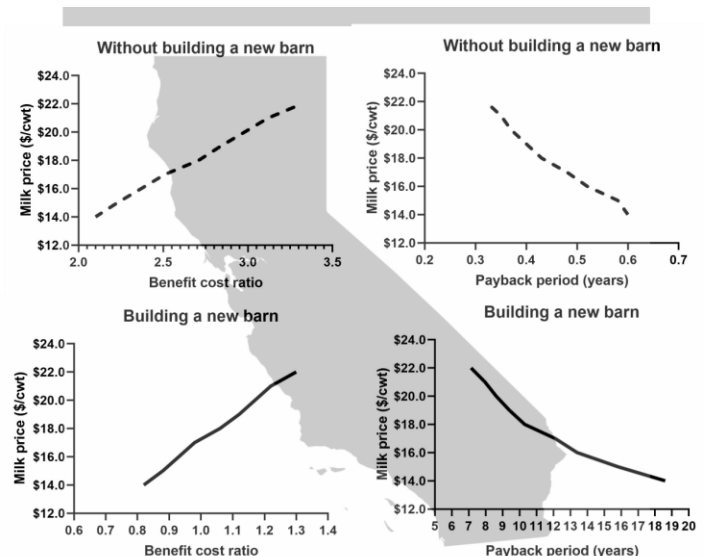
In **California**, we calculated the **losses associated with decreased milk production** in the next lactation to be **708 pounds when dry cows aren't cooled**, which represents a \$63 reduced profit per cow per year. These numbers were adjusted and calculated based on the average number of heat stress days per year in California (69 days in CA compared to 219 in FL). In addition to reduced milk production in the next lactation, the economic losses due to **lower production and higher culling rates** of heifers born from heat-stressed dams in California can sum up to **\$75 per cow per year**. Therefore, the state of California might lose **\$180 million per year** due to heat stress if dry cows are not cooled. These losses can be even higher if you have a more seasonal herd, with a higher percentage of calvings during the fall.

What to do?

The answer is easy: **cool your dry cows!** You might ask: is it feasible to cool dry cows? Our economic feasibility analysis has shown that **it is feasible to cool dry cows even when milk prices are low or if a barn needs to be built**. In Figure 1, we have summarized the results of our economic analysis for California. If you do not need a new barn for your dry cows, even if milk prices are as low as \$15/cwt or only small increases in milk production in the next lactation are achieved (2.2 pounds), the investment in fans and soakers pays off quickly. If a barn needs to be built,

the payback period will depend on the milk price. For instance, with a milk price of \$20/cwt, the investment in a new barn, fans, and soakers will be paid back in 8.6 years. These calculations do not consider the additional effects in heifer milk production and longevity mentioned before; we are updating these numbers considering these additional benefits, which will favor the investment in properly cooling dry cows.

If you are interested in an evaluation of the economic feasibility of cooling your dry cows, please contact Dr. Fernanda Ferreira at fcerreira@ucdavis.edu.



New Nutrient Management and Soil Quality Advisor in Fresno, Madera, Kings, and Tulare Counties



Please welcome our new Nutrient Management and Soil Quality Farm Advisor for Fresno, Madera, Kings, and Tulare Counties, Joy Hollingsworth. Joy's position is the result of a new partnership between the University of California and the USDA-NRCS. In addition to conducting a research and extension program on soil quality and nutrient management, she'll also be providing technical support to the NRCS.

Joy is a San Joaquin Valley native whose interest in agriculture started when she joined her local FFA chapter in high school. She earned a B.A. in Communication from UC Davis, and an M.S. in Plant Science from Fresno State. Joy has worn many hats in the agriculture sector, having interned with Bayer CropScience, Pioneer Hi-Bred, and Dow AgroSciences, as well as working for sustainable ag non-profits such as the National Center for Appropriate Technology (NCAT) and the Community Alliance with Family Farmers (CAFF).

Prior to her Farm Advisor appointment with UCCE, Joy spent six years working for the University of California in two other roles. At UC Davis, she conducted research on sugarbeets and oilseed crops, while at the UC Kearney Agricultural Research and Extension Center in Parlier she assisted with drought and variety trials on sorghum. "Growing up in Kingsburg, I understand the challenges and issues we face in the San Joaquin Valley and look forward to serving my local community. I believe that my wide range of research and extension experiences will help me in my new role as a farm advisor, and I look forward to working with growers, consultants, allied industry, and government agencies to address soil and nutrient management challenges. Please feel free to contact me with questions or suggestions of topics to address. I look forward to speaking with you!"

Contact Joy at (559) 241-7527 or joyhollingsworth@ucanr.edu

2019 Annual Alfalfa and Forage Field Day

Thursday, September 19, 2019
UC Kearney Agricultural Research and Extension Center,
9240 S. Riverbend Ave., Parlier, CA

Get ready for a half-day of forage research demonstrations and educational presentations in the field and in the classroom. The meeting will begin early morning and end with lunch (provided).

Program agenda to be determined. Please visit the link below for the latest information:
<https://www.eventbrite.com/e/2019-alfalfa-and-forage-field-day-tickets-68018209295>

No cost to attend.

Attendees may request meeting accommodations by contacting our office at (559) 852-2730.

DPR, CCA, and CURES continuing education credits pending.

For more information, contact Nicholas Clark: (559) 852-2788 or neclark@ucanr.edu

A Meeting You Don't Want to Miss

Brooke Latack - UCCE Imperial, Riverside, and San Bernardino

Foodborne pathogen contamination. Drought. Wildfire. Increasing feed prices. Regulatory mandates. California agriculture is no stranger to adapting to constant challenges. Though frequent discussion and discord surrounding these issues can cause burn out of farmers, being part of these discussions is critical to solving these issues and maintaining a positive relationship with others in the ag community. Over the last year, countless discussions and meetings focusing on the concern of livestock's impact on food safety have occurred. Here are the three main things I learned about the importance of farmers (of all commodities) participating in these crucial yet difficult discussions.

- ◆ **Your participation removes assumptions made about your operation**

“I didn't realize they we're already doing that,” was said at least once at each meeting I attended with combined ag groups. It's difficult for people outside of your commodity to know what you are already doing to mitigate impacts your operation may have, though these individuals may get the general idea of how you manage your operation. Being present at meetings provides an opportunity for you to share your practices. Do you already feed an additive that decreases pathogen shedding? Do you keep records of manure used as fertilizer? Do you take regular plant samples to make sure they are pathogen-free before harvest? These are all things that may be so obvious to you but could be unknown, though incredibly useful information, for buyers, other commodity producers, government agencies, or even the public. By sharing your story, you make sure that any decisions or reports made are done using the most accurate information.

- ◆ **Expressing your needs as a farmer helps set a direction for research, government intervention, and future metrics**

By attending meetings with difficult discussions, you bring attention to the outcomes you would like to see. Would findings from additional research help improve knowledge and guide the conversation? Would regular meetings help reduce some of the misunderstandings within the ag community? What parts of the proposed solutions do you think are unclear, unreasonable, or unnecessary? By attending and actively participating, you are ensuring that the resulting outcomes benefit everyone, not just those making the decisions. This may include representing and speaking for your commodity. While the outcomes may not be immediately obvious at the end of the meeting, your feedback will have an impact on decisions down the road.

- ◆ **These meetings give you an opportunity to grow your knowledge base**

In the past year, I have learned more about produce production, pathogen traceback, and the livestock-produce interface than ever before. I thought I knew enough about these issues. I was wrong. Without attending these meetings, I would not have heard the candid thoughts of so many in the ag community. With time being such a precious commodity, we don't always get the opportunity to come together with others in the ag community to listen and learn. Beyond fixing whatever the current issue may be, by broadening our knowledge base, we may avoid more discord when future issues arise. If nothing else, you can meet and chat with others in the ag community that may be beneficial contacts in the future.

The takeaway: Meetings discussing sensitive topics are often long, uncomfortable, and may not seem completely helpful at first. Despite all this, your participation ensures accurate information is available to help you and fellow farmers continue to produce high-quality products while solving real, local challenges happening now.

Compost Bedded Pack Barn Design and Management Considerations

Randi Black - UCCE Sonoma, Marin, & Mendocino

Compost bedded pack (CBP) barns are an increasingly popular open barn design for housing dairy cattle, particularly with funding opportunities available through the California Department of Food and Agriculture's Alternative Manure Management Program. These barns allow natural resting positions and offer shelter with a reduced infrastructure cost compared to traditional freestall barns. However, proper barn design and excellent daily management are essential for successful composting and to avoid negative animal health outcomes. A successful CBP begins with three key principles: bedding, stocking density, and air flow.

Bedding

In a CBP barn, bedding is more than an absorbent lying surface for your cows. Bedding acts as the carbon source, or essentially food, for the microorganisms within the composting bed. Before deciding to construct a CBP barn, consider where and at what cost you can acquire a continuous supply of bedding material. A mixture of kiln-dried sawdust and shavings remains the "gold standard" for CBP bedding. Other bedding alternatives exist, though may require more frequent additions and result in less efficient composting. Moisture content (and not time) determines when additional bedding needs to be added. The CBP should be between 45 and 55% moisture. To quickly test moisture, grab a handful of compost material and squeeze it. If water drips out of the ball, the CBP is too wet and you should add more bedding. If the material cannot form a ball, the CBP is too dry and you can wait before adding more bedding.

Stocking Density

Animal numbers can fluctuate on a dairy. A CBP is not always forgiving to those fluctuations. Stocking rates in a CBP are driven by the urine and fecal outputs of the cows. Producers should aim to provide 125 to 150 square feet per Holstein cow. Smaller framed cows, such as a Jersey, require less space. Overcrowding the barn results in too much moisture, dirty cows, and potential for udder health consequences. High stocking rates can also pack down the CBP, restricting air flow to the microbes and reducing composting efficiency. When planning the footprint of the barn, design for the peak number of animals and not the average to ensure adequate space year-round.

Air Flow

The aerobic composting process requires oxygen. Adequate air flow is not only important for cow health and comfort but also to feed air into CBP. Designing the barn with high side walls and fans provides natural and mechanical ventilation. Proper ventilation ensures microbes are supplied adequate oxygen essential for proper composting. Limiting the air available to microbes can reduce or stop composting. Twice daily stirring of the pack (without fail!) is also essential for composting success. A field cultivator accomplishes deep aeration (10- 12"). A rototiller provides more shallow aeration (6-8") with more breakdown of larger compost chunks and a more uniform surface.

Key Points

- Is there a source of year-round bedding material which is affordable and consistent?
- Add additional bedding based on CBP moisture content
- Provide 125 to 150 sq. ft. per cow (Holstein; less for Jersey)
- Design the barn for peak animal numbers
- Stir the pack twice daily, without fail!
- Ventilate barn with natural and mechanical ventilation to ensure an aerobic environment for composting



Questions about CBP barn design and management? Contact Randi Black at (707) 565-2648 or rblack@ucanr.edu

UC Davis has New Milking Parlor Equipment!

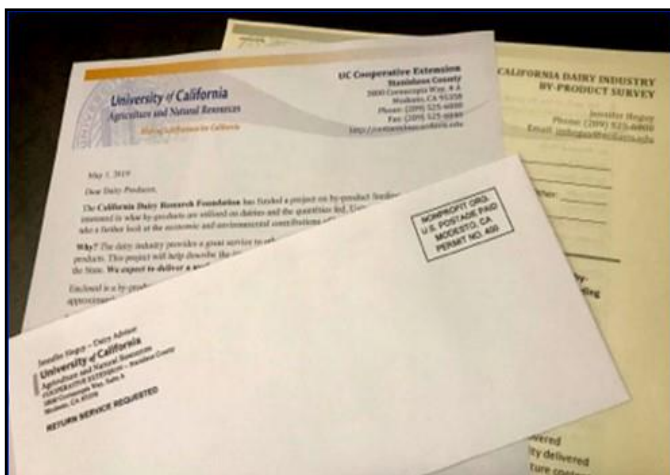
In June 2019, the U.C. Davis Dairy Teaching and Research Facility installed a single-sided, 8-cow, parallel milking-parlor. The equipment was donated by DeLaval. The cost of the installation was provided by the College of Agricultural and Environmental Sciences. The parlor has individual cow indexing and is set up to allow cows to exit in groups of four to accommodate small groups of research cows. Cow indexing will allow the collection of milk weights for each cow. The parlor exit lane has the DeLaval Body Condition Scoring system (BCS™), an automatic body condition scoring system. The new equipment replaces the 6-cow, herringbone parlor that was installed in 1992 with funding received by the California Milk Advisory Board. The new DeLaval equipment will support undergraduate education. The Animal Science major has over 1,200 students, and the milking equipment is used in many courses. Students enrolled in the dairy management courses and internships will gain hands-on learning experiences related to milking cows with the new equipment. The new equipment will support research activities that are related to nutrition, health, and the environment. The milking parlor will also contribute to outreach activities since the campus dairy is a popular site to visit by the students with family and friends as well as visits by the general public. The milk parlor will play an important role in educating students and the general public about how nutritious and wholesome milk is produced.



REMINDER: By-Product Usage Survey Responses Needed!

Are you a dairy producer that feeds by-products? Your input is needed!

We are quantifying by-product usage on dairies in order to take a closer look at the economic and environmental contributions of the practice. Dairies provide a tremendous service to other agricultural industries, and the State, by converting “wasted” nutrients into human-edible products.



Surveys were mailed out in late June. The survey will take about 10 minutes to complete. You'll find a pre-addressed and stamped envelope in the mailing for easy return.

Can't find your survey, or don't remember seeing it? No problem. Give me a call or send me an email, and I'll send you an electronic copy. Our analysis will only be as good as the data collected allows, so please consider sharing your information (you can do so anonymously!).

Questions? Contact Jennifer Heguy at (209) 525-6800 or jmheguy@ucdavis.edu

Beef Semen: An Overview of its Use as a Tool to Improve Profitability

Daniela Bruno - UCCE Fresno and Madera, Jessica M. V. Pereira - PhD student,
Fernanda C. Ferreira - UCCE Herd Health & Management Economist Specialist

Using beef semen as part of a reproductive strategy in dairy herds is not new. The use of beef semen in dairy cows in California DHIA herds* has increased from 183 breedings with beef semen in 2012 to almost 300,000 breedings in 2018 (through August). Angus is the most popular beef breed used, representing 79% of all beef breedings in dairy herds in 2018.

The National Association of Animal Breeders reported that Angus semen use has been increasing in the US since 2013, with a sharp increase of 28% from 2015 to 2018. Also, from 2015 to 2018, Holstein semen sales declined by 10%. The markets have experienced consecutive declines in the sale price for purebred heifer calves (HC) and bull calves (BC)**. In 2015, the average value of HC and BC were \$301 and \$393, respectively. In 2018 these values were \$94 (HC) and \$52 (BC), respectively, a reduction of 78%. These two prices are highly correlated (0.68), indicating that they vary together.

During the same period, the average price of top heifers dropped from \$2,140 in 2015 to \$1,261 in 2018, which may be a consequence of low milk prices observed during the period. The premium (over regular Holstein bull calf price) can be as high as \$200 if a calf is crossed with known or verified proprietary genetic sires. The increased market value of crossbred calves (combined with a lower value of heifer calves) is an opportunity for the profitable use of beef semen on dairy farms.

How can you choose the best breeding strategy for your herd?

There are many breeding strategies that can be used by farmers to capture the value of beef semen use as a reproductive strategy in their herds, especially if they are struggling with surplus replacement heifers. For instance, when using sexed semen on high-end cows, the farm can produce the needed, genetically superior replacement heifers, and beef semen can be used on the lower-end animals, with the potential of a crossbred calf bringing a premium price. A preliminary analysis by Dr. Victor Cabrera from the University of Wisconsin has shown that under the current market scenario, beef semen can be a profitable strategy for dairy farmers. The reproductive performance of the herd, calf price, dairy and beef markets, and the semen combination strategies are the key points that guide the use of beef semen in dairy herds.

Good records are imperative, including monthly milk testing, culling rates, mortality, longevity, as well as reproductive and economic performance allows producers to calculate the number of replacement heifers needed. Genomic testing may help you to select high-performance animals and rank the herd. Don't use semen price alone for selecting your bulls. Keep in mind that the beef semen used needs to be as fertile as possible and the breed chosen needs to be aligned with the crossbred market needs. Follow the market closely. The key is to have a plan!

We are interested in learning about beef semen use strategies on California dairies. This information will be used for research and development of economically viable strategies for the use of beef semen. Surveys will be hitting producer mailboxes soon (September 2019).

* Dairy Herd Improvement Association (DHIA) records provided by Bill Verbooth, Agritech (no dairy names were provided).

** California historical calf market prices provided by Dave Natzke (Progressive Dairyman) and Dr. Albert De Vries (University of Florida).

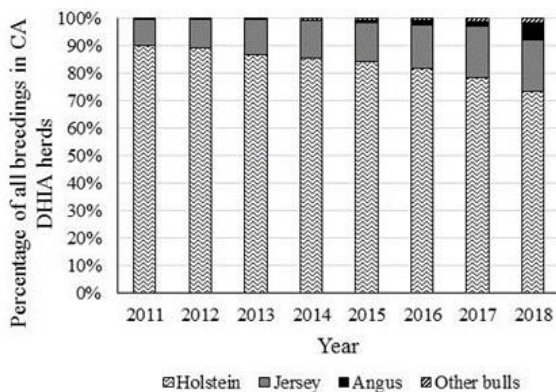


Figure 1. Percentage of California DHIA breedings with Holstein, Jersey, Angus and "other" bulls from 2011 to 2018.

University of California Cooperative Extension California Dairy Newsletter

August 2019



Betsy Karle, Dairy Advisor
Northern Sacramento Valley

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