University of California Cooperative Extension





San Bernardino County

SOUTHERN CALIFORNIA DAIRY TALK

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**Dairy Feeding Programs to Combat**

**Heat Stress**





**Gerald E. Higginbotham,**

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Now is the time to examine what changes can be made on the dairy to lessen the impacts of hot weather on dairy cows. Besides changing the cows’ environment to lessen the effects of heat stress, dairy producers may also modify their feeding program in order to give their animals additional relief during hot weather. Here are some key points to consider in feeding dairy cows during heat stress:

1. **Heat stress effects on feed intake**

Voluntary intake of feed dry matter during hot weather has been shown to decrease to about 55% of that eaten by cows when temperatures are between 40°F to 75°F. Dry, dusty feeds are not as preferable during hot days. For this reason, wet feeds such as wet brewers or distiller grains, wet citrus pulp, corn silage, winter forage, alfalfa haylage or green chop should be utilized during hot weather.

It is important to remember that wet feeds can mold easily, therefore, a load should be consumed within 5-7 days. If one is unable to utilize wet feeds in their ration, simply adding 10-20% water to a mixed dry feed can do wonders for feed intake during hot weather. One should also clean the feed bunk area frequently in order to prevent mold buildup.

The time that you feed your cows during heat stress can also influence feed intake. In periods of hot weather it is recommended to feed 60 to 75% of the mixed ration after 6:00 p.m. The remaining 25 to 40% is to be fed before 6:00 a.m. Cows do very little eating during the day in heat stress conditions so more feed needs to be offered in the cooler hours of the day. Feed that is in the sun all day is not very palatable to the cows.

1. **Possible Feed Additives**

**Buffers**: Decreases in forage intake will lead to rations containing over 60 to 65% concentrate. This will lead to digestive upsets known as ruminal acidosis. This is due to the pH of the rumen becoming too acidic which leads to the growth of undesirable rumen bugs. Buffers are added to rations to help maintain a more desired rumen pH. Generally, symptoms such as cows off feed, low butterfat test or loose manure may indicate an acidosis problem. To help achieve optimum rumen fermentation during the summer, rumen buffers are generally recommended.

**Added fat**: Feeding of fats increases the energy density of the ration enabling one to decrease slightly the amount of concentrate which is fed. When feeding fat, be careful not to feed over approximately 6-7% total fat in the ration dry matter. Higher levels can affect palatability and fiber digestion by rumen microbes. Ration adjustments should be considered when fat is added, such as to feed adequate amounts of fiber to maintain rumen digestion. In addition, higher levels of calcium (0.8 to 1.0 percent) and magnesium (.25 to .30 percent) in the total ration dry matter are recommended.

**Minerals**: Sodium (Na) and Potassium (K). Raising dietary Na from 0.18 to the 0.4 to 0.5% range of DM resulted in up to a 10% increase in milk yields. Research has also shown increasing K to 1.53% of dietary DM resulted in greater feed intake and higher milk yields. The increased dietary requirement of K in heat-stressed cows was attributed to greater excretion of K in sweat in hot compared to cool weather. Also, less forage is eaten in hot weather, which usually decreases K content of the ration.

**Fungal Cultures:** Studies in Arizona have shown reduced rectal temperatures and respiratory rates as well as increased milk yields in cows fed an *Aspergillus oryzae* extract. We examined the addition of *Aspergillus oryzae* during hot weather on a commercial dairy in Fresno County. Cows fed *Aspergillus oryzae* had lower rectal temperatures compared to controls for 9 of 12 weekly determinations. In another trial conducted under hot summer conditions in Arizona, cows fed yeast culture produced 2.0 pounds more milk per day than controls.

**Summary**

Milk production decreases during heat stress primarily because of reduced feed intakes. Water is the primary medium for dissipation of excess body heat and milk contains about 88% water. Cows need an abundance of clean, cool water. Remember to consider if you would drink the water from the trough that the cows are drinking from. Feeding of buffers and/or supplemental fat often allow for feeding high concentrate rations without the undesirable effects. Several by-product feeds (beet pulp, soy hulls, citrus pulp, etc.) might also aid in keeping milk fat at acceptable levels during heat stress. Milk yields were higher in heat-stressed cows when Na and K in the diet were increased.

**Culling Considerations**

**Jennifer Heguy, UCCE Stanislaus/San Joaquin Counties**

With milk prices falling to non-profitable levels, cost-saving measures are imperative. When the cost to produce milk exceeds the return, one approach is to cull animals from the herd in order to decrease costs, mainly feed. Prior to sending animals to slaughter or consignment, please consider the following:

1. Do not ship downed animals. If treatment is not an option, animals should be humanely euthanized. If your dairy does not have a treatment/euthanasia plan, please speak with your veterinarian to establish protocols for downed or sick animals.
2. If there is any chance an animal will not last the duration of the trip to consignment or slaughter, do not ship the animal. Sick or weak animals would fall under this category, and should be humanely euthanized on the premises.
3. Animals that will not pass pre-slaughter inspection, such as animals with severe cases of ocular cancer (cancer of the eye), cannot enter the food supply. These animals should be humanely euthanized on the farm.
4. Very thin animals are prone to excessive carcass bruising and decreased yield. Culling animals in a timely fashion to ensure adequate body condition at the time of consignment will add value to your culled animals.
5. Ensure treatment withdrawal times have elapsed prior to shipment.

The care and well being of your animals is your responsibility. Every dairy should maintain protocols to handle downed, sick, and weak cattle. It only takes one poorly thought out incident to bring consequences on an entire industry. It is absolutely necessary to join efforts in order to maintain a positive dairy industry image. Every producer benefits from positive feedback from customers and consumers. Shipping unfit animals to slaughter is illegal and inhumane, decreasing the demand by the processing facilities and decreasing consumer appreciation for the hard work and effort you put into every gallon of milk.

**Survey of Tail Docking Practices in California Dairies**

**Noelia Silva-del-Río, UCCE Tulare County and Pete Kistler, DVM and Betsy Karle, UCCE Glenn County**

A survey of tail docking practices in California dairies was conducted in February 2009. Twelve large animal veterinarians were surveyed regarding the tail docking practices of their dairy clientele. The data set contained information from 171 dairies located in Tulare (n=91), Kings (n=15), Kern (n=4), Fresno (n=1), Butte (n=2), Glenn (n=44) and Tehama (n=14) Counties. The average herd size was 1,742 cows and ranged from 25 to 12,000 cows. Fourteen dairies currently dock tails and six dairies previously docked tails but abandoned the practice within the last year. Results from this survey are presented in **Table 1.** A total of 90.6% (n=171) of the dairies do not dock tails and 88.7% (n=294,339) of the cows are in dairy operations where tail docking is not practiced. Survey results suggest tail docking is an uncommon and diminishing practice in California.

**Table 1**. Current tail docking practices in California as a percentage of

cows and as a percentage of herds.

Herds

(n=171)

9.4%

(n=294,339)

11.3%

Total

(n=111)

10.8%

(n=268,602)

11.7%

San Joaquin Valley

(n=60)

3.3%

(n=25,737)

6.8%

Northern Sacramento Valley

Cows

Cows

*The authors would like to thank the participating veterinary practices for providing this valuable information.*

**Tail Docking Dairy Cattle**

**Dr. Cassandra Tucker, Assistant Professor, UC Davis**

Recently, a bill has been introduced to the California State Senate that would ban tail docking of dairy cattle. If this bill passes, it would be part of a nationwide trend to set standards for how farm animals are cared for in the US.

The decision to dock tails often begins with good intentions. Farmers often see docking as a tool to improve udder health and cow cleanliness. If these benefits exist, should we stop the practice? Over the last 10 years, scientific studies have evaluated the costs and benefits of tail docking dairy cattle.

In the 2007 National Animal Health Monitoring Survey (NAHMS), cow cleanliness was scored on a subset of dairy farms included in the survey. Dr. Jason Lombard, the lead author of the NAHMS study, reported our findings at the 2008 American Dairy Science Association meeting. We found that farms that docked 50% + of their herd had more dirty cows than farms with intact tails. These results are opposite of the perceived benefits of tail docking. Instead, these results support the idea that tail docking is viewed as a management tool to improve cow cleanliness.

Direct comparisons of docked and undocked cows show that docking does not improve udder health or cow cleanliness. A local dairyman was trying to decide if he should dock or not and he approached us about conducting an experiment on his farm. He docked half the herd and then we visited regularly to measure the cleanliness of his cows and compare his mastitis records. We found no differences in either cleanliness or udder health associated with docking on his farm. Since this study, several other US researchers have looked at cleanliness, milk quality and both subclinical and clinical mastitis. Their results have agreed with our first study: no health or cleanliness benefits of tail docking.

In addition to not providing any health and cleanliness benefits, there are some disadvantages of tail docking. For example, a study from USDA found that cows with docked tails have twice as many flies on the lower half of their body compared to cows that have intact tails. Not surprisingly, the tail plays an important role in fly control for the cow.

Finally, other researchers have assessed if docking is painful for cows. Studies at University of Guelph, University of Wisconsin and USDA have evaluated the pain associated with docking with an elastrator ring or a hot iron, in both calves and cows. The results from these studies are mixed. Some find a behavioral response to the docking procedure, while others found little difference. These results indicate that the pain of docking is not severe, especially in comparison to other common procedures like dehorning.

In summary, the scientific study of tail docking has found that docked cows are not any cleaner or healthier, and have more flies on their legs and udders than undocked cows.

If you have questions about this article or tail docking research, please contact me: cbtucker@ucdavis.edu or (530) 754-5750.

***The tail docking bill was passed in the time between when the article was written and the time it went to print.***

**Dairy Nutritionist Wins Esteemed Teaching Prize at UC Davis!**

Ed DePeters, a professor in the Department of Animal Science, has received the UC Davis Prize for Undergraduate Teaching and Scholarly Achievement. DePeters teaches an undergraduate course in livestock production, and upper division courses in dairy production and animal feeds and nutrition. DePeters’ research has focused on how the composition of milk, particularly the fatty-acid content, can be modified by changes in the ration, and how agricultural by-products such as almond hulls and cottonseed can be used as feedstuffs.

**Congratulations Ed DePeters !**



**Bulk Tank Milk Quality in Tulare County**

**Noelia Silva-del-Río, UCCE Tulare County**

Routinely, bulk tank milk is tested to assure compliance with the national, state and local milk plants. Testing bulk tank milk helps to ensure the safety and quality of dairy products. The following tests are routinely performed in bulk tank milk:

* Somatic Cell Count (**SCC**): Measures white blood cells in milk. Indicates the prevalence of mastitis in the herd.
* Standard Plate Count (**SPC**): Measures the colony forming units (**CFU**) in milk after 48 hours of incubation at 90°F. Indicates the number of bacteria entering the raw milk.
* Lab Pasteurized Count (**LPC**): Measures the colony forming units in milk after being pasteurized at 143°F for 30 min. Indicates environmental bacteria resistant to high temperatures entering the milk.
* Coliform Count (**Coli**): Measures the Coliform colony forming units in milk. Indicates bacteria from manure or a contaminated environment entering the milk.

Bulk tank milk data collected from August 2007 to July 2008 by the milk inspector - HHSA Tulare County, was used to evaluate SCC, SPC, LPC and Coli (n=302 herds). The percentage of Tulare herds with all their bulk tank milk

samples under the regulatory limits set by the California Department of Food and Agriculture (CDFA ) was: 90.2%

for SCC (<600,00 cell/mL), 71.6% for SPC (<50,000 CFU), 81.0% for LPC (<750 CFU/mL), and 52.0% for Coli (<750 CFU/mL). The SCC, SPC, LPC and Coli counts for the top 25% herds, the bottom 25% herds and the median counts are represented in **Table 1**.

The percentage of Tulare County herds in the different SCC median categories is shown in **Figure 1.** The SCC median (or middle value) for herds with less than 800 cows was 265,000 (cell/mL); between 800-1600 cows was 240,000 (cell/mL); more than 1600 cows was 235,000 (cell/mL). The SCC median from Jan-Mar was 275,000 (cell/mL), whereas from Apr-Dec was 240,000 (cell/mL).

**In summary, although most of the bulk tank milk samples collected were in compliance with the CDFA regulatory limits, there is an opportunity to improve bulk tank milk quality especially regarding SCC and Coli counts.**

**Figure 1**. Percentage of Tulare County herds in different SCC median categories.

**Why should I care about my bulk tank milk?**

1. Your paycheck is going to reflect the results of your bulk tank milk analysis.
2. Cows with high SCC produce less milk.
3. Remember high SCC and bacterial counts are responsible for reducing shelf life, producing off-flavors and decreasing dairy product yield. The US dairy industry will be globally competitive, only if milk collected at the farm is of high quality.

**How I can improve my milk quality?**

1. Keep your cows in a clean & dry environment.
2. Implement good milking practices.
3. Routinely evaluate your milking equipment.
4. Clean your milking equipment using the proper detergents and the right water temperature.

**Unapproved Feeding of Cotton Plant By–Products, Including Gin Trash or Cotton Stalks**

**Dr. Asif Maan and Dr. Stephen Beam, CDFA**

It has been brought to our attention that various cotton plant by-products such as gin trash and cotton stalks may be available as livestock feed. Article 2, Section 2678 of the California Code of Regulations details the unlawful sale or use of material containing pesticide residue. Routinely, the Feed and Livestock Drugs Inspection Program obtains samples of gin trash and cotton stalks and analyzes them for pesticide residues. With rare exception, the results indicate the products are adulterated with above tolerance residue levels of several different pesticides. If pesticide residues are detected, it is important that feed distributors and dairy producers understand that these cotton plant by-products cannot be used as livestock feed. If it is determined that any crop co-products adulterated with pesticide residues have been distributed for animal feed, the consignee and the livestock products may be held in violation of state and federal law (Title 40 Part 180 of the Code of Federal Regulations). Violations could lead to official action against the producer, with possible immediate restrictions on the sale of milk or livestock. In some cases gin trash is being used as livestock bedding. This practice may be acceptable; however, prudent judgment must be exercised to prevent livestock from inadvertently consuming gin trash that could jeopardize livestock health or the resulting food products. For additional questions you can contact Natalie Krout-Greenberg, Feed, Fertilizer, Livestock Drugs and Egg Regulatory Services Branch at 916-445-0444.

**Top Notch Dairy Practices**

**Jennifer Heguy, UCCE Stanislaus/San Joaquin Counties**

Each spring, hundreds of young students take a trip to Bartelink Dairy in San Joaquin County to learn where their milk comes from. The children (and many parents) learn about everything from what cows eat to why it is important for a dairy producer to take good care of his/her animals. After a tour of the dairy, including watching animals being milked in the parlor, John serves cheese and ice cream to his eager audience. The trip concludes with a talk from the district California Milk Advisory Board Dairy Princess, and a lot of questions. Bartelink Dairy is telling the dairy industry’s story, and is doing its part to educate the consumers of today and tomorrow.

***Do you have an innovation, or take part in an educational activity you’d like to share with your fellow dairy producers? If yes, let your local farm advisor know and we’ll try to incorporate your idea in our next issue.***

**Systems Management**

**Nyles G Peterson, UCCE San Bernardino County**

When you think of your dairy, you probably think about its various parts: the milking barn, the calf nursery, and the feeding operation, to name only a few examples. If you manage your dairy by trying to maximize those individual units, do not feel alone.  Since the first half of the twentieth century, America has adopted that style of management. By cutting the elephant into bite-size pieces and working to maximize those pieces, the United States has become the greatest industrial power the world has ever seen. During the last few years, a new understanding of the process of management has emerged -- systems management. At its broadest level, system thinking encompasses a large and shapeless body of methods, tools, and principles, all oriented to look at the interrelation of forces, and to see them as part of a common process.

A system is a perceived whole whose elements “hang together” because they affect each other and operate toward a common purpose. There are several major concepts in that definition. One is that the parts of a system affect each other. Another is that for a system to exist there must be a common purpose. The purpose affects the system.

What is the purpose for your dairy? Is it to produce the maximum milk possible? Is it to provide a way of life that you and your family enjoy? Is it to make as much money as possible? Management will be different depending on the purpose. If you have no well-defined purpose, there will be endless activity but no progress.

System interrelationships are often invisible – until someone points them out.  If you ask yourself questions, such as, “What happens to that if I change this?” you will begin to see that every element of your dairy is part of one or more systemic structures. The dairy system is not as easily recognized as it would be in an automotive assembly line, where parts are added in sequence to make the finished product. A good systems manager is someone who can see many units operating simultaneously.

The goal of management should be to maximize the efficiency of the whole in pursuit of purpose. You cannot always maximize the whole by maximizing the individual parts.  Since that point probably challenges your present paradigm, let me site an example. Let us say that an automotive engineer, working in the transmission division, discovers that by adding a certain part to the transmission, he can reduce the cost of the automobile. If the goal is to maximize the transmission division, then he will not suggest the addition of the part because it will increase the cost to his department.  The part will only be added if the goal of each department is to lower the cost of the entire car.

If you have not done so already, decide on the purpose for your dairy operation, and then examine how everything contributes to that purpose. Results are only measured over time.  It will take years to know if you are effectively working on purpose, but a systems approach will help you move toward that goal.

Nyles G. Peterson

Dairy Advisor