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**Pistachio Shell Impactions**

*Dr. Pat Blanchard - California Animal Health and Food Safety Lab*

In October, CAHFS laboratory in Tulare received dead cows and heifers from 3 dairies after animals were fed pistachio hulls contaminated with pistachio shells. The pathologist found colon, abomasum and small intestine impactions caused by the pistachio shells. Deaths were due to intestinal rupture or ulcers that lead to peritonitis at sites of pistachio shell impaction. Pistachio hulls were included in the dry cow and heifer rations and represented 17 to 18% of the DM. One dairy owner **visually** estimated that pistachio hulls were contaminated with at least 15% pistachio shells. Pictured is an open section of intestine that is impacted with pistachio shells.



**Jejunal (Intestinal) Hematoma in Cattle**

*John Adaska, California Animal Health and Food Safety Laboratory*

Jejunal or intestinal hematoma is a condition that is recognized as a cause of death in adult dairy cows. The typical history is a mid-lactation (>100 days in milk) high producing cow on a high ration with a short duration of being ‘off’ possibly with bloating, abdominal pain and blood in the feces. Some animals may demonstrate weakness or even appear drunk and many are found dead without prior clinical signs. On post-mortem examination there is a variable length area, usually of the mid-jejunum, with a hematoma (this resembles a ‘blood blister’) within the wall of the intestine creating a partial obstruction of the lumen. Occasionally there is more than one hematoma present. The intestinal lumen will also be filled with a large amount of clotted blood. There is commonly a large amount of green liquid and some feed distending the intestine proximal to the hematoma due to obstruction and ileus preventing normal movement. The rumen and abomasum may also be distended with content. Ultimately the cause of death is exsanguination into the intestine. The underlying cause for this entity is not certain. Some research suggests *Clostridium perfringens* type A as the cause but this bacterium is a normal inhabitant of the bovine intestine and seems to proliferate whenever there is blood present in the gut. In addition, the histologic lesions of jejunal hematoma do not resemble those seen in other clostridial diseases. Fortunately, these cases are usually sporadic with no more than a handful occurring on a dairy within a given period of time and therefore losses from this entity do not become catastrophic. Other names for this entity include ‘hemorrhagic bowel syndrome’ and ‘bloody gut syndrome’ but these may apply to a wider spectrum of intestinal problems.

## Back to Basics: The ABC's of Forage Analysis.

Jennifer Heguy – UC Dairy Advisor, Ed DePeters - UC Davis, & Jed Asmus – Independent Nutritionist

High quality forages are a staple in California dairy rations. It's important to know what you're paying for when buying forages, or what nutrients your home-grown forages are providing in the ration. Forages are typically variable in chemical composition. The primary reason for this variability is that forages are harvested at various stages of physiological maturity, but harvest methods, plant variety, soil fertility, and weather conditions also play important roles. One of the most crucial aspects of accurate forage analyses is obtaining a representative sample to send to the lab, something we'll cover in a future article. In this article, we'll cover three major components of feed analysis: dry matter, crude protein, and fiber (ADF & NDF). We'll delve deeper into the different components of forage analysis later, but for now, our intention is to bring a general understanding to the "what's and why's" of basic wet chemistry analysis.

CHEMISTRY ANALYSIS RESULTS		
Dry Matter		35.9
Moisture		64.1
PROTEINS		
	% DM	% CP
Crude Protein	7.7	
Adjusted Protein	7.7	
Soluble Protein	5.07	66.2
Ammonia (NPN)		
ADF Protein (ADICP)	0.79	10.3
NDF Protein (NDICP)	1.11	14.5
Rumen Degr. Protein	6.368	83.1
Rumen Deg. CP (Strep.G)		
FIBER		
	% DM	% NDF
ADF	29.19	68.2
NDF	42.80	
aNDFom		
NDR (NDF w/o sulfite)		
peNDF		
Crude Fiber		
Lignin	3.44	8.04
NDF Digestibility (12 hr)		
NDF Digestibility (24 hr)		
NDF Digestibility (30 hr)		
NDF Digestibility (48 hr)		
NDF Digestibility (240 hr)		
Indigestible NDF 120 HR		

### Dry matter and moisture

Dry matter (DM) is basically what remains when the water (moisture) is removed from a feed. For example, silages contain a fair amount of water. In our corn silage example (see table), DM accounts for 36% of the feed, meaning for every 100 pounds of silage fed, 64 pounds of that is water.

Why is that important? Because while water is an essential nutrient, water does not contain energy and energy intake is essential for milk production. This is why nutritionists compare feeds and formulate rations on a DM basis – to take water out of the equation. There are a number of other reasons to know the DM of a feedstuff. To continue with our silage example, one way we use DM is to buy and sell forages. We typically purchase corn silage on a 70% moisture/30% DM basis. At 36% DM, we would be giving away nutrients for free (or if purchasing, would be getting a really good deal). We also sell and purchase alfalfa hay on a 90% DM basis, and this may be how the chemical analyses are reported.\*\*

Dry matter content of forages also tells us something about harvesting conditions. Too much water (moisture) in hay and there will be mold. Too wet or too dry silages reflect harvesting practices that do not support proper fermentation, which is essential for preserving the nutrients in the silage.

### \*\*To covert nutrients (or energy) from “90% DM” to “100% DM” basis:

Nutrient % on 90% DM basis ÷ 0.90 = Nutrient % on DM basis

### Examples

6.93% CP on 90% DM basis is 7.7% CP on 100% DM basis

54.5% TDN on a 90% basis is 60.5% TDN on 100% DM basis

## Crude protein

The next component on the lab results is titled proteins. For this article, we'll focus on crude protein (CP). From the results, we see that CP is 7.7% on a DM basis – just to review, 7.7% of the corn silage is protein when water is removed. If this were on a wet basis, the number would be much lower (2.76% Wet Basis), because the protein content would be diluted by the large amount of water.

Crude protein is an estimate of the protein content of a feedstuff, based on the amount of nitrogen measured in the lab. Nitrogen is a component of protein, and the lab method assumes that all protein contains 16% nitrogen (a slight error, because all proteins do not contain 16% nitrogen, and why it's labeled "crude" protein). By doing a little math ( $100/16$ ), this creates a conversion factor of 6.25 so that  $\%CP = \%nitrogen * 6.25$ .



Why is CP important? Nutritionists use CP to formulate balanced diets. The dairy cows, heifers, and calves on the farm all have dietary requirements for protein that is needed for maintenance and production (milk production, growth, gestation). The CP content of each individual feed is considered when formulating a ration.

## Fiber

The two measurements of fiber are **neutral detergent fiber (NDF)** and **acid detergent fiber (ADF)**. Hemicellulose, cellulose, and lignin make up NDF, while ADF includes only cellulose and lignin. The NDF components are also referred to as cell wall, and are what create the structure of plants.

Why are NDF and ADF important? One reason is that lignin is indigestible and its association with the cellulose and hemicellulose in the plant cell wall impacts the digestibility of the cellulose and hemicellulose. Cellulose and hemicellulose are structural carbohydrates that are digested by the rumen microbes. Digestibility is related to energy; if it is digested, the animal can obtain energy. For example, as the ADF content of alfalfa hay increases with maturity, its digestibility decreases so that the amount of energy obtained by the animal is less with high ADF hay compared with low ADF hay. This relationship between ADF content and digestibility is the basis for marketing hay in CA based on TDN content. Another example of this effect is BMR corn silage. BMR corn has lower lignin content, so that fiber digestion is often improved and thus giving BMR corn silage higher energy content when compared with conventional corn silage.

Your nutritionist will use NDF and ADF in various ways. The fiber (NDF & ADF) content of the diet is important to support milk fat production, enhance rumen function, and promote high DM intake. Acid detergent fiber is sometimes linked to energy calculations and NDF is often linked to DM intake.

## Take home message

It's imperative for nutritionists to test forages for quality parameters to formulate rations, but it's also helpful for you to be able to read your forage results and have a basic understanding of the different components. The concept of DM is something everyone working with feed on your dairy, including feeders, should understand.

## Save Money by Sticking to Protocols

*Betsy Karle, UCCE Glenn & Tehama Counties*

While we don't have control over the price of milk or the amount of rain in the Midwest, we can still exert some influence over how we spend money on our dairies. Medicating animals is certainly not the largest expenditure on a dairy, but a penny saved is still a penny earned. So, let's take a moment to review the use of protocols in your treatment regimens.

First and foremost, educate employees on what is expected of them. Post protocols in the medicine storage area or wherever they will be seen by the employees responsible for following them. Make protocols a part of employee training and reinforce the importance of following them. Don't forget to follow up- if the protocols aren't working or are too difficult to follow, rework them with your veterinarian. Be sure all medications, prescription or not, are very clearly labeled. Remember, every medication on the dairy should be used according to label; if it's being used off-label, it needs an Rx label from a veterinarian (penicillin is a prime example). If an antibiotic is a one shot drug ("Inject as a single dose"), make sure employees know not to retreat. Don't leave any room for judgment calls that are likely to create residue issues!

This is also a good time to evaluate your record keeping system. Is it being used? Is it working? Is it convenient? It's difficult to carve time out of a busy day to evaluate management, but using protocols to their fullest potential may help create some calm and structure amongst the chaos.

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## Western Dairy Management Conference

*March 6-8, 2013*



Mark your calendars for the next Western Dairy Management Conference. It will be held in **Reno, March 6-8, 2013**. The program is filled with useful information for dairy owners, managers, and employees. This is the best all-around conference in the United States and is right in our backyard.

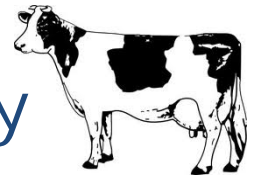
A full list of topics and speakers is available at the conference website <http://www.wdmc.org>. The Nugget is a great place to get away in March!

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## World Ag Expo Calls for Forage Challenge Entries

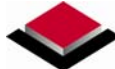
Growers of high quality forage are encouraged to submit samples of their best alfalfa hay, standard corn silage or brown midrib (BMR) corn silage for the 2013 World Ag Expo Forage Challenge. The competition challenges farmers and ranchers in 11 western states and rewards them with up to \$18,000 in cash prizes

Cost to enter the 2013 World Ag Expo Forage Challenge is \$25 per entry. All forage samples must be submitted to UC Davis for judging by December 13. Entry forms and full contest rules can be found online at: <http://www.worldagexpo.com/forage-challenge>



## Seminars will be delivered concurrently in English and Spanish

The goal of the California Dairy Management Seminars is to provide science-based information and discussion on topics contributing to the success and profitability of dairy operations in California.

December's seminars sponsored by:  **Diamond V**

### December 6, 2012 – Tulare, CA

UC Davis VMTRC  
Consumer Education Pavilion  
18830 Rd. 112 - Tulare, CA  
Noelia Silva-del-Rio  
(559) 684-3300

[nsilvadelrio@ucdavis.edu](mailto:nsilvadelrio@ucdavis.edu)

**10:00 AM-1:00 PM**

**Lunch provided**

### December 11, 2012 – Modesto, CA

UCCE Stanislaus County  
Harvest Hall  
3800 Cornucopia Way – Modesto, CA  
Jennifer Heguy  
(209) 525-6800

[jmheguy@ucdavis.edu](mailto:jmheguy@ucdavis.edu)

**10:00 AM-1:00 PM**

**Lunch provided**

### December 13, 2012 – Orland, CA

UCCE Glenn County  
Farm Advisors Office  
821 E. South Street - Orland, CA  
Betsy Karle  
(530) 865-1156

[bmkarle@ucdavis.edu](mailto:bmkarle@ucdavis.edu)

**5:30 PM-8:30 PM\***

**Dinner provided**

**\*\*Registration begins 30 minutes prior to the times listed above\*\***

## SEMINAR PRESENTATIONS

### **Examining Sick Cows—Step by Step.**

*Discussion of how to identify and examine sick animals, and what steps to take when additional actions are required.*

Presented by: **Noelia Silva-del-Rio**, DVM, PhD—UC Vet Med Extension Dairy Specialist

### **Common Fresh Cow Diseases—Cause, Treatment, and Prevention.**

*Discussion of common fresh cow diseases, including treatment and prevention of disease.*

Presented by: **Travis Thayer**, DVM—Diamond V Dairy Technical Trainer

**\*Presentations will be given separately in English and Spanish\***

**Seminars are offered free of charge.**

**Pre-registration is appreciated to guarantee your handouts and meal.**

Preregister by **phone** (209-525-6800) or **email** ([jmheguy@ucdavis.edu](mailto:jmheguy@ucdavis.edu)). Please specify location attending (Tulare, Modesto, Orland) and language (English or Spanish).