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Troubleshooting Dry Matter Results

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& Nicholas Clark – UCCE Kings, Tulare & Fresno

Sometimes, a dry matter (DM) result just doesn't make sense. What you see in the standing crop, at the silage structure or in a previous DM determination and the results don't match up. This can happen with samples measured on-farm as well as those sent to a commercial lab. Invest time and troubleshoot to ensure you have good data. Here are a few areas to troubleshoot when presented with potentially inaccurate DM results:

1. Do you have a good sample?

   Standing crops

   - In corn, for example, avoid sampling within 50 feet of field edges, directly from irrigation borders, or abnormal areas of the field like a sand streak or a low spot where water and nutrient stress are likely to occur.
   - Collect at least 10 whole, normal looking corn plants to make 1 sample. Cut them with a shovel, knife, or machete from the base of the plant at your ideal chop height.
   - More than one sample is ideal for understanding how DM varies across your field, such as from the top to bottom of the irrigation or between a split in planting dates due to a delay in sowing to avoid a heat wave.
   - How was your sample handled? If the sample is not analyzed immediately, store your sample in a cool, dry place in a sealed plastic bag. Carry an ice chest or refrigerate your sample to store until analyzed.

   Silages (and other feedstuffs)

   - Is your sample representative of what you'll be feeding? Be sure to take multiple grab samples of the feedstuff. Mix these grab samples in a bucket, and then subsample to analyze for DM.

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Also In this Issue…

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- For silages, do not take the samples directly from the structure face, instead, remove the forage from the face (with a front-end loader, for example), move a safe distance from the face, and sample the removed forage. It's best to do this with forage freshly removed from the face.
- How was your sample handled? If the sample is not analyzed immediately, store your sample in a cool, dry place in a sealed plastic bag. Carry an ice chest or refrigerate your samples until they are transported to a lab or on-farm measurements are complete. Minimizing storage time reduces the likelihood of a compromised sample.

2. Is your scale working properly?
   - Check the batteries and consider buying an inexpensive calibration weight kit.
   - Keep the scale clean and free of debris that can prevent weighing components from working properly.
   - Always weigh on a stable, level surface and block the wind.

3. When in doubt – compare!
   - Split your sample and run DM multiple times to see if your results are repeatable.

4. Train, train and re-train!
   - Having a written protocol for sampling, storing, and analyzing DM on-farm is important to obtain accurate results.
   - Check in on the person responsible for measuring DM to be sure he/she understands the protocol, has properly working equipment, and doesn't have any questions or concerns.

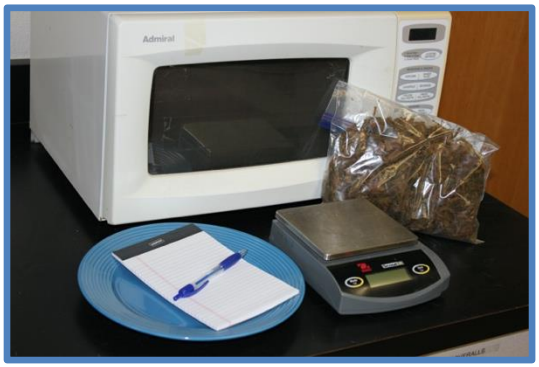

Photo: Jennifer Heguy

Want Alternative Manure Management Information?

Deanne Meyer - UC Davis & UC ANR, Jennifer Heguy – UCCE Stanislaus, San Joaquin & Merced Counties & Denise Mullinax - California Dairy Research Foundation

The Alternative Manure Management Program is accepting applications for grants of up to $750,000. By now, those interested in submitting an application are well on their way with the paperwork. There's much detailed information needed to complete the process.

It is key to be sure you've done your homework sufficiently. You don't want to end up implementing a practice that does not fit your expectations or needs.

Take a virtual fieldtrip and get information on alternative manure management practices. The California Dairy Quality Assurance Program has a page dedicated to alternative manure management practices. Factsheets, producer interviews and webinars related to use of vacuums, mechanical separators and compost bedded pack barns are available to help you better understand operational aspects.

http://ucanr.edu/ammp

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How to Calculate the Nutrients from Manure Applied to Fields

Deanne Meyer - UC Davis & UC ANR, Nicholas Clark UCCE Kings, Tulare & Fresno & Jennifer Heguy - UCCE Stanislaus, San Joaquin and Merced

Fertilizer prices are HIGH and rising.

The good news is that manure is a readily available source of nutrients. If you're ready to use manure as a fertilizer, you need to consider a couple points. Knowing how many pounds of nutrients are applied to fields is an important part of crop nutrient budgets. Moisture content is variable which makes determining nutrient application rates challenging.

The higher the moisture, the less concentrated the nutrients are in that truckload of material. **As-received values** on a manure lab report, which account for the moisture in the manure, can be used to easily determine the quantity of nutrients applied to fields directly from the source. Think of the as-received value as what is in the truck/spreader. Since the as-received lab analysis report takes the moisture dilution into account, the values can immediately be used to calculate the nutrient application rate.

		Moisture	DM	N
		%	%	%
No.	Description	as rec'd	as rec'd	as rec'd
1	Scraped manure	40.3	59.7	0.54

Let's look at an example based on the included lab analysis.

To calculate **pounds of nitrogen applied per acre**, we need to know two values: 1) weight of the material applied, let's assume 20 tons manure/acre and 2) %N as received, 0.54% from the report.

Field application (pounds N/acre):

1. First, divide 0.54% N by 100 to convert from % to a decimal: 0.54% N / 100 = 0.0054 N
2. Next, multiply 0.0054 N by the applied tons/acre: 0.0054 N x 20 tons = 0.108 tons N
3. To covert tons to pounds, multiply by 2000 (there are 2,000 pounds in a ton): 0.108 tons N x 2000 = 216 pounds N

In this application, you have applied 216 pounds N per acre. You can apply the above steps to any nutrient concentration expressed in %, as received. If your nutrient is expressed in ppm or mg/kg, change step 1 above by dividing by 1,000,000 instead of 100.

In the example above, the 40.3% moisture (and corresponding DM) is a moot point, since it has no bearing on the final result of pounds N/acre applied. A common mistake would be to assume that you need to do something with these values. Moisture (and corresponding DM) is important, just not for this calculation.

Photo: Nick Clark.

It is super important to remember that manure solids have nitrogen in the organic form. This form of nitrogen is slower release and only some will be available this growing season. Consult with your nutrient management adviser to use your solid manure strategically.

This all assumes you have a representative sample (composited from more than 10 grab samples). That's a topic for a future newsletter article!

Dairy Manure Compost – A New Enterprise

Sat Darshan Khalsa, UC Davis

The California dairy industry is in a strong position to consider developing manure compost to meet a growing demand for organic matter amendments. Many cropping systems, in particular orchard crops like almonds, are primed to experience a growing demand for organic matter amendments in the coming years. This demand is fueled by very frequent shortages of irrigation water and the rising cost of fertilizer, particularly nitrogen (N) and potassium (K). Organic matter amendments, like those products derived from dairy manure, have been shown to increase soil water holding capacity and provide valuable N and K nutrients in orchards. In a statewide survey of almond growers conducted in 2015, the number one rated most accessible form of organic matter was dairy manure. At the same time, almond growers reported concerns with food safety and nutrient availability. Many advances in our knowledge of how to effectively use organic matter in orchards have occurred in recent years. The following are typical product specifications that many orchard growers, specifically nut crops like almonds, will require:

1) Free of pathogens and weed seeds

2) Rich in nutrients like nitrogen and potassium, but low in ammonium

3) Low in soluble salts like sodium and chloride

4) A stable product with a carbon-to-nitrogen ratio (C:N) of 10-13

Photo: Sat Khalsa.

Many of these specifications can be met with proper handling of manure and composting practices. The process of composting will kill pathogens and weeds seeds where proper temperatures are met and maintained. Dairy manure is naturally rich in N and K, and the composting process will reduce the amount of ammonia build up. The salt content of dairy manure could be a challenge depending on the water source used by the dairy farm, as many of the salts found in manure are the result of the water used by the dairy. Finally, the composting process will create a stable product, and the C:N will naturally arrive at 10-13 through proper management. If manure is too rich in nitrogen, then the addition of materials with high C:N could be considered like rice chaff, almond or walnut shells or woody prunings. Caution should be followed when mixing dairy manure with other higher C:N materials, because there is no substitute for the nutrient value of California dairy manure. The following is chemical analysis of a dairy manure compost sourced from Tulare County that is a premium product used by growers of many different specialty crops. The values are reported on a 100% dry matter basis. Composts can vary in dry matter from 70-90% depending on conditions. These analyses can be used as a benchmark if a dairy farm is interested in starting a new dairy manure compost enterprise.

Table. Nutrient and salt contents of a Dairy Manure Compost on a dry matter basis

C:N	Total C (%)	Total N (%)	P_2O_5 (%)	K_2O (%)
9.75	21.0	2.15	2.14	5.19
NH4-N (ppm)	**NO3-N (ppm)**	**PO4-P (ppm)**	**Na (%)**	**Cl (%)**
298	<10	8966	0.81	0.85

Colostrum and Microbiome- Connecting the Dots

Betsy Karle – UCCE Northern Sacramento Valley

Every dairy producer knows the importance of colostrum to the future success of dairy calves. While we know a lot about quality, quantity and benchmarks for success (see Vol 13 Issue 2 of this newsletter for more info), we still have a lot to learn about how colostrum management affects the microbial community that colonizes the calf's gastrointestinal (GI) tract after birth.

Increased diversity of the fecal microbiome is linked to better health outcomes and increased weight gain in dairy calves. After a calf is born, its environment and diet affect the bacterial population in the gut. The goal is to colonize the digestive system with "good" bacteria and minimize harmful bacteria that can cause disease. Management strategies like heat treating colostrum and ensuring timely delivery of excellent quality colostrum positively affect the microbiota that the calf develops. The microbial population evolves rapidly and studies suggest that a calf's first week of life is an especially vital time to establish a healthy gut.

There is wide agreement that treatment with antibiotics and feeding milk with residual antibiotics (i.e. waste milk) causes microbial imbalance in the gut. While the effect of antibiotics on microbial populations is a well-studied topic, little is known about how the common practice of freezing colostrum may affect the colonization of the GI tract and if there is any effect on calf health.

To further investigate this area, we have teamed up with researchers from Western University of Health Sciences to conduct a study comparing fresh and frozen colostrum samples. The project will examine the viable microbiome in colostrum samples collected from dairies throughout the Western states. This information will be utilized in a follow up study that monitors calves throughout the preweaning period to determine associations between varied colostrum management practices and health outcomes. If you are interested in providing colostrum samples for the study, please contact Betsy Karle at bmkarle@ucanr.edu or 530-865-1156.

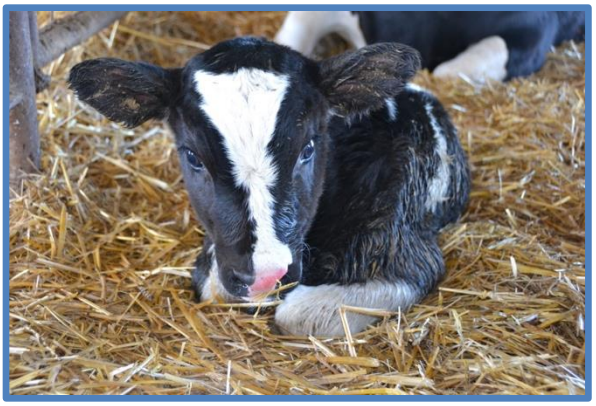

Photo: Mackenzie Gomes

Lameness in Ruminants Conference 2022
August 1st – 5th

Looking to learn more about hoof health? This year the Lameness in Ruminants Conference will take place in Bloomington, Minnesota.

- The **trimmer track** will feature producer, trimmer and on-farm personnel centric talks presenting tools and practices to implement in their current operations
- The **beef track** will update you about current lameness problems in beef feed yards and beef cattle in general.
- The **small ruminant track** will discuss lameness and welfare in small ruminants.
- The **research track** will highlight the latest research on hoof health.

You can learn more at: https://lamenessinruminants2022.com.

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