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Sample Preparation & Lab Dry Matter for Feed and Forage

1. Application

All forage samples received at the lab are thoroughly mixed, sub-sampled, weighed, dried, and ground prior to analysis. The mixing and sub-sampling operations should ensure a homogeneous mixture for analysis. Depending on the analyses requested, some fresh sample will be saved.

2. Summary of Methods

3. Safety

Basic precautions regarding mechanical equipment and electric motors must be followed. All electrical equipment is properly grounded and installed and maintained by qualified electricians. Dust masks, safety glasses and ear protection plugs should be used when grinding forages.

4. Interferences

5. Sample Collection, Preservation, and Handling

Forage samples are typically received in a fresh, heterogeneous state, unsuitable for most analysis. The amount of sample needed for analysis is generally 130-150 grams. Many samples are larger than this as received. These samples must be sub-sampled to ensure the most representative sample as possible of appropriate volume. This is normally accomplished by placing the entire sample in a large plastic tub and thoroughly mixing the contents prior to sub-sampling for dry matter analysis.

6. Apparatus and Materials

6.1 Cabinet-type, forced-air drying oven at 55 C, $\pm$ 3 C
6.2 Analytical electronic balance, accurate to 0.1 mg
6.3 Aluminum pan, approximately 20 cm diameter, 5 cm deep
6.4 Bucket or bin and large counter for mixing and sub-sampling
6.5 Wiley mill, 4 mm size
6.6 Cyclone grinder, 1 mm size
6.7 Forage sample trays accommodating five rows of ten sample cups
6.8 Forage sample cups with covers, plastic, 6 cm in diameter, 8 cm deep

7. Reagents

None applicable.

8. Methods

8.1 Record tare weight of aluminum pan.
8.2 Thoroughly mix the sample in a bucket.
8.3 Sub-sample about 130-150 grams in the aluminum pan. Record initial weight of sample plus pan.
8.4 Take special notes of the following forage types and/or analyses:
    8.4.1 For large sample volumes such as TMR's spread the sample out on a counter to thoroughly mix the sample. Divide the TMR sample into four sections. Put one section in an aluminum pan to weigh and save one other section in a bag. Place that portion of the sample in a freezer to save until after all analyzes are complete. The remaining sections can be discarded.
    8.4.2 For any sample requiring the Degree of Starch Access (DSA), mold & yeast, or mycotoxin analysis, spread the sample out on a counter after thoroughly mixing the sample. Divide the sample into sections, depending on how much sample has been submitted. Put one section in an aluminum pan to weigh and save one other section in a bag. Place the sample in a freezer until further analysis can be completed on an undried and unground.
8.5 Place pans in drying oven for 24-48 hours.
8.6 Weigh pans back to record dry weight of sample plus pan.
8.7 Grind sample thru 4 mm Wiley mill, followed by the 1 mm Cyclone grinder, and place in sample cup and cap sample before placing in a numbered sample tray.

9. Calculations

Percent Lab Dry Matter (% DM):
% Lab DM = {(Dry Weight of Sample and Container – Tare Weight of Container) / (Initial Weight of Sample and Container – Tare Weight of Container)} X 100

Percent Lab Moisture:
% Lab Moisture = 100 - % DM

10. Quality Control

11. Reporting

Results are reported as % Lab Dry Matter on an as received basis.

12. References