DATE: APRIL 2007

Total Ash in Forages

1. Application

This procedure is applicable for the determination of ash in all types of dried, ground forages and feeds.

2. Summary of Methods

A dried, ground sample is ignited in a furnace at 500^{o}C to oxidize all organic matter. Ash is determined by weighing the resulting inorganic residue.

3. Safety

Basic precautions regarding mechanical equipment, electric motors, and glassware must be followed. All electrical equipment is properly grounded and installed and maintained by qualified electricians.

4. Interferences

This procedure is not applicable for ash determination in liquid feeds or feeds high in sugar content.

5. Sample Collection, Preservation, and Handling

All samples are dried at 55^{o}C in a cabinet-type forced air dryer for 12-16 hours. After drying the sample is ground to pass through a 1 mm forage mill. A subsample is then dried at 105^{o}C for 3 hours to determine laboratory DM content.

6. Apparatus and Materials

6.1 30 ml porcelain crucibles, low wide form, numbered with furnace-proof ink
6.2 Muffle furnace with pyrometric controller
6.3 Analytical balance, sensitive to 0.1 mg
6.4 Desiccator, with vented lid
6.5 Drying oven

7. Reagents

None

8. Methods

8.1 Remove crucibles, which have been dried for at least 2 hours at 105°C from oven, and move to desiccator. Cool and record weight of crucibles to the nearest 0.1 mg (W_1).
8.2 Weigh 1.5 to 2.0 g of sample into the crucible, recording weight of crucible and sample to the nearest 0.1 mg (W_2).
8.3 Ash in furnace at 500°C for 2 hours after the furnace reaches temperature.
8.4 Allow crucibles to cool in furnace to less than 200°C and place crucibles in desiccator with vented top. Cool and weigh crucible and ash to the nearest 0.1 mg (W_3).

9. Calculations

9.1 % Ash (DM basis) = $[(W_3 – W_1) * 100] / [(W_2 - W_1) * \text{lab DM} / 100]$
W_1 = tare weight of crucible in grams
W_2 = weight of crucible and sample in grams
W_3 = weight of crucible and ash in grams

10. Quality Control

An in-house standard is run to gauge run acceptability.

11. Reporting

Results are reported as % ash on a dry matter basis.

12. References

12.1 Ash of Animal Feed. (942.05) Official Methods of Analysis. 1990. Association of Official Analytical Chemists, 15th Edition.