

Acid Detergent Fiber

Materials:

600 ml Berzelius beakers
Fiber digestion apparatus
Aluminum weigh pans, 5.5 cm
Whatman #541 filter paper, 5.5 cm
Buchner funnels
Filtering flasks
Desiccator

Reagents:

Acid Detergent Solutions (1 N H₂SO₄):

Add 55.68 ml concentrated Sulfuric acid (98%) (VWR Cat # 2876-46, FW 98.08, CAS # 7664-93-9) and 40 g Hexadecyltrimethylammonium bromide (Alfa Aesar Cat # A15235, FW 364.46, CAS # 57-09-0) to about 500 ml dd water. Dissolve and bring to a volume of 2 liters with dd water. Allow to stand overnight.

Acetone (Fisher Cat # A18-20, FW 58.08, CAS # 67-64-1)

Procedure:

1. Transfer 0.25 to 1.00 g sample (in duplicate) to Berzelius beakers.
2. For each duplicate, label an aluminum pan. Place a filter paper in each pan, dry in 100 °C oven for 20 minutes, cool in desiccator, and record weight.
3. Add 100 ml acid detergent solution. Place on reflux apparatus and turn on condenser.
4. Heat to boiling, and gently reflux 60 minutes. Wash sides of beaker with ADF solution if sample boils up on sides.
5. Filter sample with light suction onto filter paper.
6. Rinse beaker well with hot dd water.
7. Wash residue with hot dd water 2 or 3 times (approximate volume 250 ml). Watch for foaming, rinse until clear.
8. Wash residue twice with acetone.
9. Carefully transfer paper and residue from funnel into pre-weighed pans. Place sample in drying oven at 100 °C for at least 8 hours or overnight.
10. Remove from oven, cool in desiccator, weigh and record weight. Save sample for ADL or ADIN if needed.

Calculations:

Sample	A Sample Weight	B DM	C Dry Paper + Pan	D ADF + Paper + Pan	E ADF % dmb
#34	1.0488	0.8989	1.7266	1.7634	3.903

$$E = \left[\frac{D - C}{A \times B} \right] \times 100$$

$$3.903 = \left[\frac{1.7634 - 1.7266}{1.0488 \times 0.8989} \right] \times 100$$

To calculate mean, sd, and % CV, see section on statistical analysis.

Reference

Goering, H. K. and P. J. Van Soest. 1970. Forage fiber analyses. Agr. Handbook No 379, ARS, USDA.