

INDIGESTIBLE ACID DETERGENT FIBER

Updated September 2013

I. References:

Goering, H.K. and P.J. Van Soest. 1970. Forage Fiber Analysis (Apparatus, Reagents, Procedures and Some Application). Agricultural Handbook No. 379, Agricultural Research Service, U.S. Department of Agriculture.

McDougall, E.I. 1948. The composition and output of sheep's saliva. *Biochem. J.* 43:99.

Tilley, J.M.A. and R.A. Terry. 1963. A two stage technique for the in vitro digestion of forage crops. *J. Brit. Grassland Soc.* 18:104.

Waller, John C. 1978. Slowly degraded protein sources for ruminants. Ph.D. Dissertation. University of Nebraska, Lincoln.

II. Personal Protective Equipment:

- A. Lab Coat
- B. Safety glasses/goggles
- C. Latex gloves

III. Reagents:

- A. Rumen inoculum - use a 50:50 (vol/vol) mixture of ruminal fluid collected from the hay-fed and cob-fed steers
- B. McDougall's Buffer with urea ($\text{CN}_2\text{H}_4\text{O}$) added at 1.0 g urea/liter
- C. ADF solution

IV. Preparation of Feed Samples:

- A. Place approximately 0.6 ± 0.0040 g of feed in a 50 ml centrifuge tube and inoculate with 30 ml of a 50:50 mixture of the rumen inoculum and McDougall's buffer
- B. Follow the In-vitro Dry Matter Digestibility Procedure until centrifugation
 1. Incubate the feed and rumen fluid at 39°C for 48 hours
 2. Centrifuge at $1600 \times g$ for 15 minutes
 3. Remove fluid by pouring off or with suction strainer. Discard fluid
 4. Save this sample to complete IADF analysis with fecal or abomasal material.

V. Procedure for IADF Analysis:

- A. Place approximately 0.3 ± 0.0040 g of abomasal/ fecal particulate matter in a 50 ml centrifuge tube or use the residue of the feed sample recovered from step (4) above
- B. Inoculate the tube with 30 ml of the mixture of rumen fluid and buffer described in (A) above.
- C. Incubate tube and contents at 39°C for 96 hours.
- D. Remove tube from incubation (**Freeze all samples if you cannot run ADF immediately**) and transfer contents to a 600 ml Berzelius beaker.
- E. Using a wash bottle containing ADF solution, rinse all feed particles clinging to sides

of tube into beaker.

F. Bring volume of beaker contents to 150 ml with ADF solution.

G. Proceed with ADF analysis as described by Goering and Van Soest (1970), filtering the hot solution through Whatman 541 filter.

VI. Calculation:

$$\% \text{ IADF (feed or abomasal)} = 100 \times \frac{\text{ADF residue (DM)} - \text{blank}}{\text{Sample Wt. (DM)}}$$

Note: May be expressed on dry matter or organic matter basis.