

# Wet Chemistry Feed Testing Methods Employed by Parkland Laboratories

Below are the references applicable to the wet chemistry methods employed by Parkland Labs in testing forage and other animal feeds. Exact procedure may be slight adaptations or modifications of the references cited.

## 1. Moisture

AOAC Method 930.15. Helrich, K. ed., Official Methods of Analysis 15th Edition, 1990, Association of Official Analytical Chemists.

## 2. Protein

AOAC Method 981.10. Helrich, K. ed., Official Methods of Analysis 15th Edition, 1990, Association of Official Analytical Chemists.  
(Kjeldahl with N-determination by boric acid titration and/or colorimetrically). (See also AAFRD SCDC Method F004.A. Automated Determination of Protein, Calcium and Phosphorus by Colorimetry.)

## 3. Acid Detergent Fiber

ANKOM Technology Method 8.

Based on AOAC Method 973.18. Helrich, K. ed., Official Methods of Analysis 15th Edition, 1990, Association of Official Analytical Chemists. (See also Van Soest, P.J. and H.K. Goering, Forage Fibre Analyses, Agriculture Handbook 379, U.S. Department of Agriculture. 1970.)

## 4. Neutral Detergent Fiber

ANKOM Technology Method 9.

Based on Van Soest, P.J., J. B. Robertson, and B. A. Lewis. 1991. Journal Dairy Science 74:3583-3597. (See also Van Soest, P.J. and H.K. Goering, Forage Fibre Analyses, Agriculture Handbook 379, U.S. Department of Agriculture. 1970.)

## 5. Calcium, Sodium, Potassium and Magnesium

Atomic Absorption.

Employing a sulphuric acid/hydrogen peroxide digest and a Perkin Elmer 5000 atomic absorption spectrophotometer, calcium and magnesium measured by absorption, and sodium and potassium by emission.

Calcium (alternate method)

Employing a sulphuric acid/hydrogen peroxide digest, calcium alternately measured by EDTA titration using calcein as an indicator (adaptation of ASBC Beer-20, B. Calcein Indicator Method).

## 6. Phosphorous

Ammonium molybdate/ammonium metavanadate colorimetric method. Manual Adaptation of AAFRD SCDC Automated Method F004.A.

## 7. Nitrate

The method employed is a manual adaptation of AAFRD SCDC's automated colorimetric method described in Section S001 of its Soil and Soil Amendments SOPM 1995.

Nitrate is very water-soluble and is easily quantified. Nitrate extracted from feed is reduced to nitrite by cadmium which then reacts with sulfanilamide under acidic conditions to form a diazo compound which proceeds to react with N-(1-naphthyl)ethylenediamine dihydrochloride to form a reddish purple azo dye which is read at 540nm.

Results are expressed as % Nitrate (NO<sub>3</sub>)

## 8. Soluble Protein, Insoluble Protein, Acid Detergent Insoluble Protein, Energy Calculations

Inquire.