

Appendix VI

GOAL, OBJECTIVES, AND APPROACHES OF THE
NATIONAL INFRARED REFLECTANCE PROJECT ON FORAGES
(AS AMENDED)

- I. GOAL: Establish an improved near-infrared reflectance analytical system for forage and feedstuff quality evaluation
- II. OBJECTIVE 1: Relate chemical and physical properties of forages to their infrared reflectance spectral properties and to their utilization by ruminants

Approaches:

- a. Relate nuclear magnetic resonance and other analytical techniques to interpretation of NIR results and chemical data,
 - b. Investigate sequential changes in NIR spectra of feeds which occur in the process of digestion by ruminants, and
 - c. Determine effects of anatomical and other physical properties of forages on NIR spectra.
- OBJECTIVE 2: Test and validate NIRS for determination of forage quality.

Approaches:

- a. Define and measure plant, environmental, and other factors contributing to variation in infrared prediction of chemical composition and animal response, and
 - b. Develop and test computer programs which provide continuing advances in data processing and mathematical treatment of infrared data to maximize prediction accuracy.
- OBJECTIVE 3: Establish standards for the conduct of NIRS analyses

Approaches:

- a. Develop procedures for instrument standardization,
- b. Develop protocol for calibration and verification of prediction equations, and
- c. Develop procedures for sample preparation and presentation of samples to NIRS instruments.

OBJECTIVE 4: Establish and maintain a library of reference forage samples for use in NIRS instrument calibration

Approaches:

- a. Produce/obtain samples with known chemical and nutritional properties,
- b. Establish procedures and a facility for maintaining sample integrity, and
- c. Catalog, provide, and distribute samples for use in forage-quality assessment.

OBJECTIVE 5: Facilitate transfer of NIRS technology Approaches:

- a. Establish levels of accuracy and precision of parameters required for use of NIRS in forage breeding and management,
- b. Establish levels of accuracy and precision of parameters required for use of NIRS in animal-utilization research, and
- c. Formulate guidelines for use of NIRS in quality assessment of forage and feed products used in livestock feeding and the marketing system.