VII. Feed and Forage Analyses

A. General Information

- Taking a representative sample is the most important step in assuring quality analyses. Please follow sampling procedures as described later in this section.

- Supply complete information on the sample submission form to ensure maximum usefulness to the client. The **animal** and **feed type** must be given if you want calculations for total digestible nutrients (TDN) or net energies.

- For total mixed rations, concentrates, vitamin/mineral blends, grains and by-products, collect multiple core samples or grab samples. Composite the cores or grab samples, mix thoroughly, and sub-sample into **quart** Ziploc bag.

- Submit hays and silages in a **gallon** Ziploc bag.

B. Taking a Good Forage Sample

Adapted from a procedure published by the National Forage Testing Association http://www.foragetesting.org/lab_procedure/appendix/appendixE.htm

a. Introduction

Sampling is a major factor affecting the accuracy of forage quality analyses. Chemical analysis is valid only to the extent that the sample analyzed represents the lot of hay or haylage to be fed.

Forage Lots

Take samples by "lots" of hay or silage. A "lot" is defined as hay or silage, which has been made from the same cutting, field, and stage of maturity. A sample should not represent more than 200 tons dry matter. For lots larger than 200 tons, two or more samples should be taken and the average of the results used to represent the lot.

Sampling Equipment

The most commonly used sampling method for baled or stacked hay employs a hollow tube (probe) to extract core samples from the hay. Use a probe that travels at least 12 to 18 inches into the hay package for most hay packages. The internal diameter of the probe should be at least 3/8 of an inch. Probes with sharpened tips must be kept sharp to cut through hay. A dull tip may reduce the amount of stem material in the sample due to the tip sliding past rather than cutting through the stems.

b. Sampling Hay and Haylage

Baled Hay

Baled hay packages are not uniform products because the initial windrows were not uniform and the baling process affects the distribution of leaves and stems (bale structure) within the bale. Based on the structure of the hay package to be sampled, the hay should be probed in such a way as to adequately sample the various concentrations of stems and

leaves. At least 20 cores (one core per bale) should be taken, combined, and mixed well to develop one sample per lot. Bales within a lot of hay should be sampled at random. Random means that there should be no pre-chosen reason for selecting a specific bale to sample (i.e., location, color, leafiness, etc.). Techniques to guard against non-random sampling are to sample every fourth or fifth bale going around the stack, truck, or down the row in the field or take at least five random samples from each of the four sides of a stack.
Sample rectangular bales, regardless of size, using a probe centered in the end of a bale and drill horizontally into the bale.
Sample round bales by drilling horizontally into the curved side of the bale. Deteriorated hay from the exterior of the bale should not be sampled if it will not be fed to animals or they can be selective in their feeding. However, if hay to be sold includes the deteriorated exterior, it should be included in the sampling. Bales stored outside should be sampled within 2 to 4 weeks of feeding so that continued deterioration does not significantly lower bale quality from the sample taken for analysis.

Stacked Hay

For loose hay use a probe at least 30 inches long with 3/4 inch or larger internal diameter and drill at an angle from the side of the stack to the probe's full depth in 20 random locations throughout the stack. In a mow, hold the probe vertically and drill at the spot where the hay is compressed by the weight of the operator. Discard any weather damaged surface layer that would not be included in the part being fed or sold. Hay stored outside should be sampled within 2 to 4 weeks of feeding so that continued deterioration does not significantly lower bale quality from the sample taken for analysis.

Cubes and Pellets

Hay cubes or pellets should be sampled by collecting several hay cubes or handfuls of pellets from 15 to 20 locations in each "lot" so that a minimum of 40 cubes or 2 lb of pellets are selected. Each lot should be limited to 200 tons or less.

Silage

Silage. Collect a 1- to 2-lb sample from the silo unloader while it is operating or a comparable amount from several sites in a bunker or silo tube

Special Sample Handling

Sampling silages, haylages and total mixed rations may produce a large amount of sample. The sample should not be divided because stems and leaves will separate and settle in the sample. The sample should be taken early in the week, placed in a polyethylene, airtight (e.g. freezer) bag, sealed tightly and immediately mailed or delivered to the laboratory. Perishable samples should be mailed immediately after collection and should be mailed early in the week so they arrive at the laboratory without spending the weekend in shipment. Samples except for those intended for prussic acid testing can be frozen before shipment.

Record Keeping

It is recommended to keep records of information about each lot of forage that is sampled and analyzed. These records should contain information about the source (area where grown), forage type (species), cutting number, stage of maturity, and special conditions (frost, drought, etc.). Further information such as cutting date and interval between cuttings may also helpful when managing your forage quality.