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LABORATORIES



A & L REFERENCE GUIDE

FEED ANALYSIS



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Agricultural Feed Analysis Sampling Guide

Hay Sampling	Bulk Concentrates
Silage Sampling	Grain in Bin
Forage Crops in the field	Sample Handling
Sacked Feed	References

****Accuracy of the feed analysis depends on the sample submitted. Care must be taken to collect a sample representative of the feed lot.**

Hay Sampling

Hay may be sampled as it is stored, if it is dry enough to keep without further curing. Different cuttings should be sampled and analyzed separately unless different cuttings are being fed at the same time, in which case they may be sampled in the same proportions as they are being fed.

Hay samples should be taken with a core sampler, if possible.

1. Ensure that tips are sharp enough to cut through the hay to prevent selective sampling.
2. Core sampler should penetrate at least 12"-18" into the bale.
3. If using an electric drill or a hand brace, run the drill at slow speeds. High speeds heat the probe and can damage supplies.
4. At least 12 cores of hay should be taken from random bales or locations if loose or chopped hay.

When sampling hay to be fed on your farm, avoid sampling decayed or moldy hay or other portions of hay that will be discarded or would likely be refused when fed to animals free choice. However, include deteriorated materials if the hay will be ground, sold, or purchased in order to best describe all the hay. Place the entire sample into a plastic bag and seal tightly.

Square or Round Bales

Collect one sample from each of 15-20 bales (from a single lot) by coring straight in from the center of the end of square bales and from the wrapped circumference of round bales. When sampling hay to be fed on your farm, avoid sampling decayed or moldy hay or other portions of hay that will be discarded or would likely be refused when fed to animals free choice. However, include deteriorated materials if the hay will be ground, sold, or purchased in order to best describe all the hay. Place the entire sample into a plastic bag and seal tightly.

Loose or Compressed Hay Stacks

Use a hay probe to collect 15 or more samples from each "lot". Sample loose hay stacks from the top and from the side. Compressed loaf stacks require six sampling locations: 1) top front, 2) top middle, 3) top rear, 4) lower front side, 5) lower middle side, and 6) lower rear side (*Figure 1*).



Figure 1. Sampling Compressed Hay Stacks

As different stacks are sampled, alternate the two sides and rotate through the six collection locations. Stand on the stack and insert the probe vertically between feet when top samples are collected. When sides are sampled, use a slight downward angle with the probe to avoid sampling parallel to stems in the stack. As with bales, do not sample deteriorated hay unless it is to be ground prior to feeding, sold, or purchased. Place samples into a plastic bag and seal tightly.

Chopped or Ground Hay

Take about 10 small grab-samples from each “lot” of hay during grinding and place all the samples into one plastic bag. Seal tightly. Sample previously ground or chopped hay beneath the surface. Collect about one-fourth of the samples from the top half of the pile and the rest from the lower half. Avoid allowing fines to sift between fingers.

Pasture

Obtaining a good sample can be difficult due to fertility and moisture differences in a single pasture. Sample by picking at random 8-10 locations. Remove the forage from a square foot area at grazing height. Mix all the collected forage and take a representative sample for analysis.

A second method is to take forage being selectively grazed by the animals at several locations for the sample. This is a preferred method in unimproved pasture where selective grazing is evident.

Sampling Silage, High Moisture Grain, Haylage and Fresh Forage

Silage, high moisture grain, and haylage can be sampled at harvest if moisture content is low enough to prevent seepage. Corn silage at dent stage or beyond should not seep. If seepage is expected, wait until seepage has stopped before sampling, or take samples as it is being fed.

Silage

Silage may be sampled either before it enters the silo or when it is fed. Collect some samples at harvest to use for early rotation balancing.

Sampling at Harvest - Collect silage in a large plastic bucket or container for several representative loads by taking random handfuls (may be taken as loads are brought to the silo). Mix thoroughly and fill plastic sample bag from this composite. Seal and send immediately or you may freeze sample to prevent decomposition, until such time as you are ready to send for analysis. *Use all precautions in preventing moisture loss of material.*

When forage is properly ensiled, results from fresh samples will agree closely with fermented forage. Collect samples at feeding for the most accurate nutritional information for ration formulation. Avoid rotted or poorly preserved material that will not be fed or consumed if fed. Such material often comes from the top of upright silos or from the shallow end and slopes of horizontal silos.

Sampling after Ensiling - Secure random handfuls of silage from at least 10 different spots over the exposed surface area of the silage. If top unloading silo or bunker, dig down a foot or more to secure handfuls to make composite. If sampling as silage is being unloaded, allow unloader to make one or more revolutions before selecting random handfuls for composite.

Upright Silos at Feeding

(Grab sample) Collect 2-3 gallons in 1-2 quart increments by passing a clean plastic container beneath the chute while unloading. Alternatively, collect 20 handfuls from different sections of the feed-bunks while feeding. Avoid contamination with old feed or supplements. Mix and take your sample.



Silage and haylage moisture (percent dry matter content) can vary considerably from one level to another in both upright and horizontal silos. Due to many reasons, such as date of chopping, rainfall, differences in fields, etc., this factor is important when allowing for both the nutrient and fiber content in the diet.

Because silages and haylage are more variable in their dry matter content than feeds stored in the dry form, it's important to continue monitoring their moisture level on a regular basis during the feeding period. The testing interval, however, will depend on how fast the silo is emptied.

Horizontal Silos

Collect 20 or more grab samples from numerous sites off the exposed face of the silo to represent the entire exposed surface. Sample to the depth as is removed during daily feeding. Sampling from the bunk may be easier and provide an equally representative sample. Mix and subsample.

Trench Silo

If silo is open, the face of the silage should be cleaned off in the center. A column of silage 6 inches by 12 inches should be removed from top to bottom, mixed thoroughly, and then a representative sample taken.

Where the silo is not opened, a series of (four to six) holes can be dug from the top with a post hole digger or suitable equipment. Spoiled silage should be placed beside the hole to be returned after sampling. The samples of good silage from each hole are mixed and a representative sample taken. Be sure holes are packed tightly with the silage that has been removed to avoid undue spoilage.

Forage Crops in the Field

Sample the plants from several (8 to 10) locations in the field at normal harvesting heights. Whenever possible, chop the forage into small pieces (1 to 2 inch), mix, and remove a representative sample.

Sacked Feed

Although most sacked feed is already mixed, it is recommended that several sacks be sampled, mixed, and a representative sample (1 pound) be submitted for analysis. **Be aware that settling is common, even in sacked feed, making thorough sampling important.

Bulk Concentrates

Commodity feeds should be analyzed as a composite of at least 10-15 areas of a given lot of feed. When mixing the composite, avoid segregation by particle size or the true sample value may be distorted. At least 1 pound, or a quart of material, should be sent to the laboratory.

Grain in Bin

It is highly desirable to use a grain probe to obtain the sample. However, if one is not available, random grab-samples from 10-15 areas of the bin can be mixed and a representative sample (1 quart) sent in for analysis.

Sample Handling

Place samples in polyethylene freezer bags and seal tightly so the laboratory can determine a dry matter concentration similar to that in the sample when collected. Double-bag silage samples for extra protection. Use extra caution if subdividing a large hay sample. Subsampling dry hay often results in loss of fines and leaves. Although subsampling of silage and mixed feed is easier, use care to obtain a sample similar to the entire lot of silage.

Freeze samples containing over 15% moisture until shipping; store dry samples in a cool location. Avoid direct sunlight and damage to the bags.



Label the bag with your name, address, lot ID, and type of material.

*Green pasture samples are normally placed in a paper bag so that they can dry better than in a plastic bag. Promptly send the sample to the laboratory.

References:

G77-331-A NebGuide - Published by Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

AS-1064 "Sampling Feed for Analysis" Sept 1993-North Dakota State University.



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