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Michigan State University Extension Service

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SAMPLING FORAGES FOR QUALITY TESTING

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Accurate feed analyses are needed for efficient use of homegrown feeds, for balancing livestock rations and for correctly pricing hay. Sampling technique is the most important factor affecting the accuracy of feed analyses. This bulletin describes correct sampling procedures for forages.

The first step in sampling is to determine the "lot" of forage to be sampled. Plant maturity, variety, cutting date, weed contamination, and soil type and fertility can greatly affect nutritive value, so simply identifying forage as "first cutting," "second cutting," etc., is not sufficient. Forage of the same type harvested from one field within a 48-hour period can be considered one lot. Weather, additives, pests and storage conditions also affect the characteristics of the forage. As changes occur in these factors, it is good practice to redefine forage lots.

The second step in sampling is to obtain a representative sample for each lot of forage.

BALED HAY: Samples grabbed by hand or flakes of hay *do not provide* accurate results. Many labs will not accept these samples because they are difficult to process. To obtain a representative sample from a lot of baled hay, you must use a core sampler. A core sampler should have a sharpened or serrated cutting tip at least $\frac{3}{8}$ but not more than $1\frac{1}{2}$ inches in diameter. Probes should penetrate square bales a minimum of 12 inches and round bales and stacks a minimum of 18 inches. Most core samplers can be operated with either a hand brace or an electric drill. Table 1 lists some suppliers of hay probes.

Square bales: Randomly select at least 20 bales from each lot of hay. If a lot contains more than 4 tons of hay, it is best to sample a minimum of five bales per ton. The more bales sampled, the more accurate the results will be. From the end of the bale, drill in 12 inches near the center at a right angle to the surface (see Fig. 1). Take one core from each of the bales selected. Place the cores in a clean container, mix thoroughly and place about 1 pint in a plastic sample bag. Seal the bag tightly and identify it with the producer's name, complete address, date and lot identification.

Round bales: Randomly select at least 10 bales from each lot. Each bale should be cored at two locations, one on each side. Deteriorated hay on the outside of the bale should not be sampled if it will not be fed to the animals. However, if the hay is to be sold, include the deteriorated portion in the sample to give the best representation of the entire lot. Mix core samples in a container, place about a pint in a sample bag, seal the bag and identify as described previously.

Hay stacks: Take six cores from each stack to be sampled. Optimum sample locations are: top front, top middle, top back, side front, side middle and side back (see Fig. 2). As with round bales, do not sample deteriorated material unless it is to be fed or sold. To collect top samples, stand on the stack and insert the probe vertically between your feet. Thoroughly mix the cores, place approximately 1 pint in a sample bag, seal the bag and identify.

HAYLAGE OR SILAGE: Sample either as the silo is filled or as it is fed. Fresh samples will test similar to fermented samples if the forage is properly ensiled.

To sample while filling: Collect one handful from each wagonload and place into a plastic bag



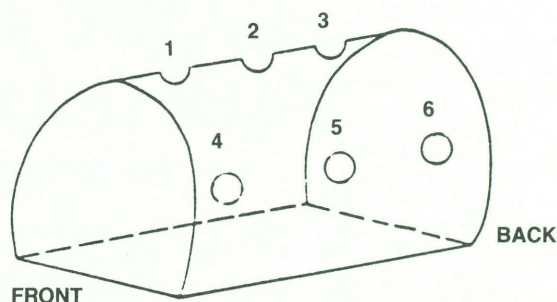
Figure 1. The proper method of sampling a square bale. From the end of the bale, drill in 12 inches near the center at a right angle to the surface.

or pail kept in a cool spot. At the end of each day's silo filling, mix the collected samples in the plastic bag or pail, then take one handful, put it into another plastic bag and place this bag into a freezer. Collect each day's sample in this manner. When the lot of forage being harvested is complete, take the samples from the freezer, mix them together, take 1 pint and submit it for analysis. Keep the sample frozen until it's sent to the laboratory.

Remember that when the type or quality of feed being placed in the silo changes, you need to take separate feed samples representing the different lots. Note the approximate location in the silo of each lot. Shelled corn, straw or shredded newspaper can be put in the silo at the end of each lot to aid in identifying the change from one lot to the next.

To sample while feeding: For upright silos, collect about 2 gallons in a clean container while unloading. To do this, pass the container under the chute several times (once per minute), collecting 1 to 2 quarts per pass. Subsample as described for fresh forage. For horizontal silos, collect about 2 gallons from approximately 20 locations on the exposed face of the silo. Mix and identify as previously described.

Figure 2. The proper locations for sampling from a hay stack. Take six cores from each stack. The best locations are: top front, top middle, top back, side front, side middle and side back.



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Table 1. Suppliers of hay probes.

NAME OF PROBE	DESCRIPTION	APPROXIMATE 1987 PRICE
1. Forageurs Hay Probe	14- or 24-inch stainless steel probe with 0.6-inch tip diameter. Has a smooth, resharpenable hardened steel tip and attached canister that holds 20 to 30 cores. Uses hand brace or electric drill. Forageurs Corp., 8500 210th Street W., Lakeville, MN 55044.	\$92.50
2. E-Z Probe	12- to 30-inch stainless steel probe with 0.5-inch tip diameter. Has a smooth, resharpenable hardened steel tip and attached canister that holds 25 to 30 cores. Uses hand brace or electric drill. Northwest Ag, P.O. Box 238, Culver, OR 97734.	\$98.00
3. Penn State Forage Sampler	18- to 30-inch stainless steel probe with 0.75-inch tip diameter. Has a serrated, replaceable hardened steel tip. Must be taken apart and emptied after each core. Different adapters for hand brace and electric drill. NASCO, 901 Janesville Ave., Fort Atkinson, WI 53538.	\$78.00 (extra tip: \$28.00)
4. Hay Chec ✓/TM	16-inch stainless steel probe with 0.44-inch tip diameter. Has a smooth, resharpenable steel tip and attached glass canister that holds 15 to 30 cores. For hand use only. A.M. Hodge Products, P.O. Box 202005, San Diego, CA 92120.	\$197.00 to \$341.00
5. Oakfield Hay Sampler	12-inch stainless steel probe with 0.5-inch tip diameter and unlimited extension rods. Has a serrated, replaceable tip. Must be emptied through a permanent side opening after each core. Different adapters for hand brace and electric drill. Oakfield Apparatus, Inc., P.O. Box 65, Oakfield, WI 53065.	\$64.00
6. Utah Hay Sampler	18-inch stainless steel probe with spiral ridge or screw thread and 0.44-inch tip diameter. Has a serrated, resharpenable or replaceable steel tip and an attached canister that holds 20 cores. Uses hand brace or electric drill. Utah Hay Sampler, c/o Jody Gale, 595 East 4th North, Logan, UT 84321.	\$90.00
7. Homemade	Use golf club shafts, ski poles, cut off soil probes, or steel tubing or conduit. Sharpen one end and place a plastic bag over the other end to catch the sample. Modifications to improve leverage or to attach a drill or hand brace may ease operation.	\$?