

Hay Bale Sampling Procedure

Proper sampling of Hay and Forage is critical to ensure an accurate forage test. Lab results are only as good as the sample provided. In practice, hay sampling produces more variation in results than does lab error. However, if sampling protocol is carefully followed, sampling variation can be reduced to an acceptable level, and the potential forage quality successfully predicted. The following steps have been compiled from various recommendations that have been in place for years and are widely considered to be the key elements of a standardized sampling protocol:

1. **Identify a single 'lot' of hay.** This is a key first step to proper hay sampling, and one frequently ignored. A hay lot should be identified which is a single cutting, a single field and variety, and generally be less than 200 tons. Don't mix cuttings, fields, or hay types.
2. **When to Sample?** It is important to sample the hay either as close to feeding, or as close to point of sale as possible. Hay immediately after harvest normally goes through a process of further moisture lost known as a 'sweat'. During this period, hay may heat up due to the activities of microorganisms, driving residual moisture from the hay. After hay has equilibrated to the range of 90% DM, it is typically quite stable.
3. **Choose a sharp, well-designed coring device.** Use a sharp coring device 3/8-3/4" diameter. Never send in flakes or grab samples, it is nearly impossible for these samples to represent a hay lot. Many probes can be used to represent a hay lot as long as they follow these principles: they easily penetrate the bale, fairly represent the leaf-stem ratio, can be easily sharpened, and produce approximately ½ lb (200 g) of sample in about 20 cores to a depth of 12"-24". We have probes available for check out at the Extension office.
4. **Sample at random.** The sampler should walk around the stack as much as possible, and sample bales at random. For example, the sampler may walk 15 steps, sample, walk 20 steps, sample, walk 5 steps, sample, while walking around stack—trying to represent all areas of the stack. Don't avoid or choose bales because they look especially bad or good.
5. **Take enough cores.** We recommend a minimum of 20 cores for a composite sample to represent a hay lot. It is recommended to take more than 20 cores (e.g. up to 35) with very large lots (100-200 tons), or with highly variable lots. With small bales, sample 1 core per bale, >20 bales; with larger (e.g. 1 ton) bales, take 2-3 cores per bale, from the round (twine) side of the bale, sampling >10-12 bales.
6. **Use proper technique.** Sample butt ends of hay bale, between strings or wires, not near the edge. Probe should be inserted at 90° angle, 12"-18" deep. With round bales, sample towards middle of bale on an angle directly towards the center of the bale.
7. **Sample amount:** "not too big, not too small". Sampling should be done so that about ½ lb of sample is produced. Too-small samples don't fairly represent the full range of variation in the hay lot. If a probe is too big or small to produce about ½ pound in 20 cores—get a different one!
8. **Handle samples correctly.** Seal Composite 20-core sample in a well-sealed plastic bag and protect from heat. Double bagging is beneficial, especially for DM measurements. Deliver to lab as soon as possible. Do not allow samples to be exposed to excess sun (e.g. in the cab of a pickup truck).
9. **Choose an NFTA-Certified Lab.** (see www.foragetesting.org for a listing of NFTA-certified labs) Samples that are brought to our office are sent to SDK labs in Hutchinson.