

MEASURE AND MANAGE

Feed Sampling Techniques and Procedures

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Success in today's 'agricultural world', especially in the production of livestock and livestock products, is directly related to the 'bottom line'.

One of the largest expenses affecting that 'bottom line' is feed costs. It is imperative to economically produce a properly balanced ration for the animals being fed.

In order to do this, one must know the nutritive value of the components which go into the ration makeup, or in some cases, of the ration itself (i.e. TMR). Whichever is selected for analysis, one of the sources of greatest variability can be the sampling of the feed. Therefore, one of the most critical steps in the analytical process is feed sampling. "Accurate Feed analysis begins on-farm with proper feed sampling techniques" in order to ensure a representative sample.

Feed stuffs can be sampled as they are being stored, during storage or during feedout. Convenience, accessibility and feed 'stability' can dictate the best time for sampling. Different feed types require different sampling techniques, although there are similar precautions to take with all sampling.

Dry Grains and Prepared Feeds

Dry grains and prepared feeds can be sampled as the storage facility is being filled. Grab samples can be taken at various times during unloading of wagons or trucks and placed in a clean, dry plastic pail or large plastic bag and mixed thoroughly. Approximately one (1) kilogram of sample is sealed in a clean plastic bag is required for analysis.

If filling of the storage facility requires more than one day, the samples for a given day should be kept in a plastic bag in a cool, dry place. All samples are then combined from the various days, and mixed well. From this, take a one (1) kilogram subsample and place in a sealed plastic bag for analysis.

Sampling can be done while the feed or grain is in storage although this may not be convenient. A grain probe can be used to take several cores from many different locations over the surface of the stored grain. This will reduce the striation effect from layering, which may take place.

If samples are taken by hand without a probe, it is preferable to scoop deep into the grain with one or both hands, then lift upwards placing the sample remaining on your hand(s) into a pail. This can be repeated several times over the surface of the stored grain. Avoid taking samples from the grain touching the sides of the structure. By scooping into a pile rather than grabbing samples from the surface, a more representative sample is achieved.

The dry feed can also be sampled as the product is being fed, if this is the ONLY alternative. Take samples over several days, storing each days' sample in a cool, dry place or even freezing them. Combine all samples (thawed) and place a one (1) kilogram sample into a plastic bag and seal it.

**** Do not freeze samples for which toxin tests are to be run ****

Notes:

- Allow the unloader to run for a few minutes before taking the sample.
- If a sample is taken from a feedcart or bunk, again, avoid grabbing samples from the surface. Scoop deeply into the feed and lift upwards.
- Take a sample from different areas of the cart or bunk.

Dry Hay and Baleage

A core sampler should always be used to sample dry hay and baleage when possible. The sampler should be sharp, to avoid deflecting tough stems. This will maintain the leaf to stem ration from source to sample. Dry hay can be sampled as it is being stored, or during storage. Baleage can be sampled prior to wrapping, or as it is being fed. However, because baleage is a high-moisture feed, it is involved in the fermentation process. As a result of this, depending upon how fermentation progresses, some values for nutritional components will change between the time that the bales are wrapped and the time that they are fed. It will be up to the individual nutritionist or farmer to decide the importance of these changes.

Take core samples from several bales. Take samples from the narrow end of square bales and from the side of round bales. An extension may be necessary for large diameter round bales. Take between ten (10) and twenty (20) cores. Combine them in a large plastic pail, and place in a clean, dry plastic bag. Remove as much air as possible, by squeezing the bag and seal it closed. Use all of the core samples to make up the submitted sample so as to not lose any leaf material, especially in dry hay.

Dry hay samples can probably be taken all at the same time; at least for each cutting. For baleage, it may be necessary to sample several bales over a period of time, as they are fed. Freeze each sample in a plastic bag to store, until enough samples have been collected. Combine all of the thawed samples and take two or three handful subsamples from them. Seal the resultant sample in a plastic bag for analysis.

High Moisture Forages and Grains

High moisture forages – haylages, silage and high moisture grains pose a situation similar to balage, in that the feed characteristics are not static; there is fermentation ongoing over a period of time (2-3 weeks). Therefore, these feeds can be sampled as the storage facility is being filled, which will give an accurate profile of the feed being fed. This will depend on how ‘well’ and how quickly fermentation progresses to completion.

If sampling as the structure is being filled, combine several samples in a large pail or plastic bag and mix thoroughly. If filling requires several days, a subsample from the days’ sample can be retained in a sealed freezer bag and frozen. When all samples have been gathered, all of the thawed subsamples can be mixed and from this, two to three handfuls sealed in a freezer bag, after removing as much air as possible.

A more accurate method of tracking the feed quality being fed, which will take into account the changes due to fermentation, variations in crop quality, cutting area or cutting time, is to sample at regular intervals as the structure is being emptied. The frequency of testing will depend on the variability of the crop. High moisture grains will require less frequent testing than haylage.

Samples can be taken over several feedings and combined into one sample. The sample should be taken after the unloader has run for several minutes. Avoid grabbing samples from the surface. Scoop down into the feed similarly to dry grains. When sampling bunk or trench silos, rake the surface prior to sampling, or dig back 3-6” from the exposed surface to obtain 10-20 grab samples.

- Whatever the feed type being sampled, whatever the method used to sample, or whatever time sampling takes place, it is to the advantage of the farmer or nutritionist to determine how to obtain the most representative sample of what the animal will receive, and to avoid biasing the results of testing in any way.

References

1. Ontario Ministry of Agriculture, Food and Rural Affairs, January 1991, “Feed Sampling Analysis” Agdex 400/60
2. Pioneer Hi-Bred Ltd., “Silage Management”
3. Pioneer Forage Manual, A Nutritional Guide