VIGORTONE®
*A Leader In Animal Nutrition Since 1912*

# FEED SAMPLING PROCEDURES AND EVALUATION OF FEED TEST

Optimum animal performance depends on proper management and nutrition. Good nutrition begins with quality feedstuffs blended into a well-balanced ration. Properly balanced rations require measurements of the nutrient content of the individual feedstuffs. Proper procedures must be followed when sampling feedstuffs, complete feeds or supplements.

Samples should be thoroughly sealed to prevent moisture loss and minimize exposure to oxygen.

Following are basic instructions for collecting, mixing and final sampling for laboratory analysis.
1. Grain — 5 to 10 random 1 lb samples should be collected, mixed and the final 1 lb sample taken from the composite mix.
2. Haylage — Corn Silage — 10 random 1 lb samples should be collected (after fermentation is complete), mixed and the final 1 lb sample taken from the composite mix.
3. Hay — Random samples from 2 or 3 bales, mixed and the final 1 lb sample taken from the composite mix.
4. Green Chop — 10 to 20 random 1 lb samples should be taken as the green chop is conveyed to the feeding bunk, mixed and the final 1 lb sample taken from the composite mix.

Random sample refers to small collections from different locations in a particular bin or storage area.

Final sample is obtained from the mixed portion of the composited random samples.

## Haylage/Corn Silage

Fermentation will alter the nutrient content of the forage initially placed in the silo. The degree of change is dependent on the many management and environmental factors that can affect the fermentation. Therefore, silage samples should be taken after the fermentation is complete.

The ability to gather a representative sample is complicated whenever the silo/bunker is filled with nonuniform forage.

Examples would include:
1. More than one type of forage.
2. Different varieties of the same forage.
3. Forage grown under different conditions/management.
4. Forage harvested under different conditions/management.

Increasing the frequency of sampling, especially when moving through a transition zone in the silo from one forage type/quality to another, is recommended under these conditions.

Top or bottom unloading silos can be sampled as the forage is unloaded. With trench or bunker silos, use a spade to remove a column of silage from the top to bottom of the open face of the silo. The material is then mixed and sampled. Alternatively, samples can be taken at multiple sites from the fresh face of the silo, mixed and sampled. Where different types of forage have been layered, it is best to sample the forage after mixing in the feed wagon. If this is not possible or practical, sample layers separately and estimate each forage's contribution based on its percentage of the surface area of the silo face.

## Baled Hay

With a forage sampler or equivalent, take core samples from 2 to 3 bales. For square bales, sample from the end, the full length of the sampler. For round bales, sample across the bales at the center.The bales should be selected at random. Each lot of hay based on cuttings or classes should be sampled and analyzed separately.

Hay samples can be taken without a forage sampler by removing a small section from each bale (2-3 bales) and cutting the hay into 3 inch lengths with shears or a hatchet. Care should be taken not to lose leaves. A random sample of the mixed composite should be taken. Remember that the leaves will tend to settle out of a mixed composite sample of chopped hay.

## Pasture

Sampling pasture is extremely difficult and lends itself to considerable error. Fertility and moisture differences, along with selective grazing of cattle, add to the problem of getting a pasture sample representative of the type of forage being consumed by the cattle. Sample by selecting 10 to 15 locations within a single pasture. Clip the forage from 1 square foot of pas-

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ture in each location, mix, and take a representative sample of at least 1 pound.

This sample should be immediately frozen in a well-packed and sealed container. With good insulation and rapid delivery to the forage lab, a minimum amount of fermentation should occur, minimizing any effect of fermentation on the nutrient content of the sample.

## Green Chop

Ten to 20 samples should be removed as the green chop is being conveyed to the feeding bunk. Samples should not be taken from the feed bunk. The samples should be mixed, and the composite sample sent to the laboratory. Green chop samples should be kept frozen until shipped to the laboratory. This will retard fermentation and provide more accurate assay. At least 1 lb or a gallon ziplock bag full should be submitted.

## Bulk Concentrates

A composite sample of at least 10 to 15 areas of a given lot should be made. When making the composite, care should be taken to avoid segregation of the sample. Smaller particles will tend to shift to the bottom of the container and distort the true sample. At least a pound or a quart of this material should be collected.

## Grain

If grain is stored in a bin, it is desirable to collect samples from 10 to 15 locations in the bin with a grain probe. If high moisture grain is to be sampled, it should be collected as previously outlined in the forage section for the type of storage facilities employed. Submit 1 lb for analytical assay.

## Sacked Feeds

Although most sacked feeds are thoroughly mixed, it is recommended that at least five or six sacks be sampled (1-2 lb), mixed and a representative sample (1 lb) submitted for analysis.

## Complete Mixed Rations

To obtain representative samples of a complete ground and mixed ration, one of the following methods should be used:

1. As the mill is discharging the completed ration, using a bucket to completely cut the flow 5 times. Remix the contents of the bucket and take the sample.
2. Feed Stored in Feeder: Using a grain probe, collect a sample by inserting the probe on left-hand top of feeder downward toward right-hand bottom of feeder. Reverse right top to left bottom. Make a composite sample.

Using either method submit 1 lb of the composite sample for analysis.

## Evaluation Of Feed Test Results

The purpose of a feed test is to obtain nutritional information about the ingredient and/or ration. Before a sample is obtained, it must be determined what information is required; how the information is to be used; and what benefits or results can occur from the information derived from the feed test. The primary purposes of analyzing samples are:

1. Ingredients/Feedstuffs: To determine nutrient content for use in formulating rations.
2. Rations: To determine if nutrient content of the ration is equal to the target or formulated level.

After samples are analyzed, the results must be properly interpreted to be utilized effectively. For ingredients, the assay results must be compared to typical values for that ingredient to determine if the ingredient is acceptable for use in the ration. The actual laboratory values (when available) should be used in ration formulations.

For ration analysis, the information obtained and the usefulness of the information are dependent on the type of sample obtained. If only a sample of the mixed ration is obtained, all that can be determined is whether the actual values are equal to or different from the target values. No information is obtained as to why the actual values are different from the target values. If the nutrient content of the ration is different from the targeted values, the differences could occur in one or more of the following areas:

1. Quantity of ingredients added not equal to the formulated levels.
2. Nutrient content of the ingredients different than the values used in formulation.
3. Feed ingredients improperly mixed or not uniformly mixed.
4. Sampling error.
5. Laboratory analytical error.
6. Combination of factors 1, 2, 3, 4, 5.

To properly evaluate the results of a mixed feed sample, the following must be obtained:

1. Samples of all ingredients used in the ration. (Laboratory assay can be used to determine the expected nutrient content of the ration.)
2. Composite sample of the mixed ration (results determine accuracy of mixing).
3. Separate samples of the mixed feed (to determine uniformity and accuracy of mixing). The mixer discharge should be divided into 2 or 3 separate fractions and samples obtained from each fraction.
4. Ration formula (with the actual laboratory values the true nutrient target can be determined for evaluation of the mixed feed samples).
5. All samples must be analyzed for the same nutrients.

With the above information, a mixed feed sample can be properly evaluated, causes of the errors identified and appropriate corrective actions determined.

If the animal is to obtain maximum performance, the ration must be consistent in nutrient content, equal the formulated level and provide the animal with the correct nutrients to satisfy all requirements.