

## EMD Nitrate Test Strip Instructions

### Sampling:

Collect 5 samples from the field or from stored forage. Test each sample with a separate test strip. For green stems cut at the recommended grazing height (typically 10 inches). Note: nitrate levels tend to be higher in the base vs. the upper portions of the plant. Some would recommend testing half way up the stem to provide an average nitrate for the whole stem. Testing from the lower portion of the stem though gives a more conservative result.

### Storage of the Strips:

Store test strips in a cool-dry, dark location.

If the reaction zone of the test strips have changed color prior to use **do not use**. Test strips will react from moisture present in air, so all precautions should be taken to make sure strips are kept dry and sealed with as much air removed from bag as possible to prevent condensation.

### Testing Plants from the Field:

*For green stems:*

Using a clean pair of pliers, squeeze several drops of plant juice from the base of the stem onto a clean surface and press the reaction zone of the test strip in the juice for 5 seconds. Wait 1 minute and then compare the test strip against the color scale provided on the photo. The darkest color means that the sample has 500 ppm (or mg/L) nitrate or higher. This material should be sent to a lab for more accurate testing before use.

*For dry stems:*

Chop the base of the dry stem into fine pieces and dampen (should be at the consistency of a moist sponge) and lightly press the damp material onto the reaction zone of the test strip for 5 seconds. Remove the plant material from the strip. Wait 1 minute and then compare the test strip against the color scale provided. Only use a small amount of water to prevent dilution of the nitrate concentration. The darkest color means that the sample has 500 ppm (or mg/L) nitrate or higher. This material should be sent to a lab for more accurate testing before use.

### Testing Dry bales, baleage, or silage:

Take 5 random samples just like you're sampling for forage quality. With bales use a hay probe to take samples. Follow instructions for dry material above.

### \*\*\*Important\*\*\*

The bottom square on the strip is the nitrate reaction zone (NO<sub>3</sub>). This is the square you should be looking at. If the test strip reacts and turns the darkest color then caution should be used when feeding. Ideally, send material to a lab an accurate reading of nitrate (NO<sub>3</sub>) in ppm and a feeding recommendation.

### To Order more Test Strips:

Website: [www.vwr.com](http://www.vwr.com) Phone: 1-800-932-5000 (they can send by overnight mail)

Nitrate Test Strips VWR Catalog #: EMD-10020-1

Price: Approximately \$62 per 100 strips.

Contact if you have questions – Ray Smith, cell 859-227-9167, [raysmith1@uky.edu](mailto:raysmith1@uky.edu)

County Agents,

Please see the information below from Cindy Gaskill at the UK Veterinary Diagnostic Lab. Dr. Ray Smith, UK Forage Extension Specialist and Dr. Chad Lee, Grain Crop Extension Specialist; [raysmith1@uky.edu](mailto:raysmith1@uky.edu), [chad.lee@uky.edu](mailto:chad.lee@uky.edu)

Test kits with 10 strips will be mailed to KY county agents upon request: Contact Ray Smith's Research Analyst Krista Lea, [krista.lea1@uky.edu](mailto:krista.lea1@uky.edu)

Dear Extension Agents,

The University of Kentucky Veterinary Diagnostic laboratory performs forage nitrate/nitrite testing and will accept samples from extension agents, producers, and veterinarians. The cost is \$25 per sample for a panel including both nitrate and nitrite analyses.

Please see the UKVDL website <http://www.lddc.uky.edu/> to download the current accession form (see link for "Forms" on the UKVDL homepage and click the links for "New Standard Accession Form" and "New Standard Accession Continuation Form"). Please provide the extension agent name and extension office information in the section labeled "Veterinarian", and provide owner/farmer information in the "Owner/Mgr" section. In the "Specimen Information" section, write the type of forage/feed in the box labeled "Other". On the second page of the accession form, in the Toxicology section, mark the box for "Nitrate/Nitrite".

If you are submitting multiple samples from one farm, please use one accession form plus the Accession Continuation form. If you are submitting samples from different farmers, please use separate accession forms for each farm.

Please contact the UKVDL Business office at 859-257-7503 to make sure your contact information including fax number and e-mail address is correct and up-to-date in our computer system. If you would like to receive results by e-mail rather than by fax, please tell the Business office staff to indicate this in our computer system.

Please see the attached document for guidelines on proper sample collection. Moist samples should be put in plastic bags, immediately put on ice and shipped with ice packs; dry samples should be placed in paper bags or boxes. Ship samples as soon as possible after collection to decrease the risk of reduction of nitrate levels.

Please contact me if you have any questions.

Cynthia Gaskill  
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## **SAMPLE COLLECTION GUIDELINES FOR FEED/FORAGE TESTING**

Proper sample collection is crucial for proper interpretation of results. Collect a number of smaller samples to form a large composite sample that is representative of the field, cutting, or batch. If different regions of the field were treated differently, then separate composite samples should be submitted for each of the different region.

At least a pound of total composite sample should be submitted. The sample represents a large amount of feed so it is critical that the sample is representative of the whole. More sample is always better than too little, so when in doubt, collect more! Be sure to mark each bag legibly with forage/sample type and identification information.

**Note specific for nitrate testing:** Nitrate concentrations tend to be higher at the base of the plants, and higher in the stalks than the leaves. Grains, seeds and leaves do not accumulate significant nitrate levels. Plants with high stem-to-leaf ratios are the most likely to cause nitrate intoxication.

Bales (hay, balage, bedding) – Use a hay probe to take core samples. Randomly select 10-20 bales that are representative of a cutting/batch. Take several core samples per bale, and mix all the cores to make one large composite sample. Different cuttings, batches, or field should be sampled separately, and submitted as separate samples.

Silage and total mixed rations (TMR) – Freshly unload some silage material or freshly mixed TMR and collect large handfuls from 10-20 different locations. Mix to form a large composite sample.

Corn stalks – Cut the stalks at the anticipated harvest level and submit the entire part of the stalk that will be fed. Collect stalks from several areas of the field. 5-10 stalks are recommended. Stalks can be cut or folded prior to shipping. Alternatively, if shipping volume is an issue, only the bottom halves of the stalks could be submitted, but remember that the result will be higher than the actual overall average nitrate concentration for the entire plant.

Pasture grasses – Collect handfuls of forage from 10-20 different areas in the field. Cut the grass at the anticipated harvest or grazing height and submit the whole part of the plant that will be ingested. Mix thoroughly to make one large composite sample.

Grains – If possible, use a grain probe to take samples. If a grain probe is not available, collect approximately ½ to 1 cup full of grain from 10-20 random places as grain is discharged from a bin or from various depths and locations in a container. Mix thoroughly and submit as one large composite sample. Note: Grains do not accumulate nitrate, so nitrate testing is not typically performed on grains.