

FAQs for Owners Atypical Myopathy Testing

What is atypical myopathy and what causes it?

Atypical myopathy is a serious and often fatal disease caused by eating the seeds, leaves and/or seedlings of the sycamore tree which contain a toxin called Hypoglycin A (HGA). Horses show signs of colic and weakness which quickly develop to muscle tremors, a low head carriage, lying down sometimes with the inability to get up. The disease can develop very quickly over a matter of hours and early supportive therapy from a vet is likely essential. The toxin prevents the horse's body from utilising nutrients that would normally allow muscles to function properly, in particular the muscles that are used for breathing, standing and movement, but also the heart muscle. Affected horses often have dark, reddish urine because of the breakdown of muscle tissue, which ends up being excreted through the kidneys. Eventually breathing difficulties and heart problems result in death or the need for euthanasia in most affected animals.

Why should I test plant material on my grazing?

By finding out if the seeds/leaves/seedlings in your pasture contain the HGA toxin and how much, you can make an informed decision about the risks posed to your own horse and then respond appropriately.

What is HGA and why do trees contain it?

HGA is an unusual amino acid that is found in certain trees but not others. We do not know its function, although it might be important for growth or for protection from grazing animals.

Do other trees contain HGA or is it just sycamores?

Research suggest that in Europe it is predominantly the sycamore tree that contains HGA. Current evidence suggests that other species of Acers, common to Europe, such as the Field Maple and Norwegian maple and other trees outside of the Acer family such as Ash and Oak do not contain the toxin. Some other species of Acer, such as the Box Elder, can also produce the toxin, as can Lychee and Ackee fruit trees.

How do I know if the trees on my pasture are sycamores?

The Sycamore tree belong to a family of trees called Acers. There are more than 25 different Acers e.g. Field maple and Norwegian maple and not all of them contain HGA. The appearance of their seeds and leaves differ and can be used for identification but it can be difficult. Asking an expert's opinion might be helpful.

Do all trees contain the same amount of toxin?

No. The toxin levels can differ between trees and differ between the leaves, seeds and seedlings of a single tree.

Does the toxin remain at the same level all year and from year to year?

We are working on answering this question in our current studies. We will publish this data as soon as it is available. It is possible that the answer depends on variation between trees, but also climatic or soil conditions or other variables.

How much toxin do horses need to eat to cause atypical myopathy?

It is very difficult to be precise about the exact amount of toxin a horse would need to ingest to be affected, as there are multiple factors involved. Horses seem to differ in their response to the toxin which might be due to genetic factors, diet, prior exposure or other variables. The time frame might also be important. These are all active areas of research and we will report results as soon as they are available.

Are other animals affected by the toxin?

Current research and clinical experience suggests that horses and donkeys seem especially sensitive to the effects of the toxin. We do not know the extent to which other animals (such as grazing sheep or cattle) might also be affected, although we believe it is likely to be much lower. We would be interested in hearing from people who believe they have evidence of other species of animals being affected by atypical myopathy.

Are there certain ages/breeds/sexes of horses that are more susceptible to atypical myopathy?

No. Horses and ponies of any age, breed, sex and height can develop atypical myopathy.

I have had horses on my field for many years without a problem. Does that mean that it is safe, even though I have Sycamore trees?

No. For some reason that we don't yet understand, some horses seem not to be affected by the toxin, even though they are potentially exposed. Of course, some horses might be very careful in what they eat, and they manage to avoid ingesting seeds and seedlings; however, there is some evidence to suggest that some horses ingest the toxin, but do not develop the life threatening disease. Currently there is no way of knowing which these horses are. Just because horses have been grazing in the field for many years, does not mean that it is safe, either for these horses or for newly introduced horses.

How should I test my grazing? How do I collect and send you samples?

Collect seeds or leaves or seedlings from either the ground or the tree. Put your plant material in a sealable plastic sandwich bag. Send this in an envelope along with the owner's plant submission

form to the laboratory using the address label available on the website. We advise samples arrive at the laboratory the next day to ensure accurate toxin levels. We no longer offer testing of mixed plant material i.e. bags containing a mixture of seeds and leaves. If there is more than one type of plant material in a sample bag we will test whichever material forms the largest part of the sample. If you wish to test more than one type of plant material each type will be charged as one test and will need to be sent in separate sample bags.

Obtain samples directly from the tree if you wish to find out the toxicity of a particular tree. In this case collect leaves and/or seeds from at least 3 different branches. If you wish to test seeds and leaves from a tree, they will need to be tested individually (and sent into us in separate bags) and will therefore incur two test costs i.e. £180 for a standard test.

Collect samples from the ground if you wish to find out the toxin level and risk to your grazing horses. Collect your sample (seeds/leaves/seedlings) from the affected area of grazing if it is localised in one area. If your whole paddock is affected divide it into 4 and collect some material from each of the 4 areas. Combine all the material into one sandwich and send to the lab.

What samples should I collect in Spring and in Autumn?

In spring, seedlings are most likely to be present along with some seeds so it would be sensible to test either seedlings or seeds that are on the ground. In Autumn, leaves and seeds are most likely to have fallen on the pasture so it would be sensible to test either of these singularly. As we no longer offer mixed plant material testing, collect whichever material is most abundant on the pasture or if both leaves and seeds are equally abundant, it would be sensible to test seeds as there is a trend for them to contain higher amounts of toxin. At all times of year if you wish to test an individual tree you should collect leaves or /and seeds directly from the tree of interest. If you wish to test both seeds and leaves they need to be sent in separate bags and will be tested individually therefore incurring two test costs.

How much should I collect?

The amount we require for each type of sample is different and may depend on the amount of material available on your pasture but we recommend the following:

A double handful of seeds

A single handful of seedlings

10 leaves

Please note that samples containing a mixture of plant material in a single bag (e.g mostly seeds with some leaves) will be analysed using only the material that makes up the highest percentage of the sample (in this example only the seeds would be tested). If you send more than 1 bag, we will assume you want the contents of each bag handled separately, so if you take samples from 4 quarters of your field remember to combine them into 1 bag at the end.

How much does testing cost?

Each sample for our standard test costs £90. For example if you send in 2 samples the total cost will be £180.

What do you mean by one sample?

One sample is one bag of seeds or leaves or seedlings. If you want to test more than one paddock, more than one area of a paddock or more than one tree, the cost will be more than £90. Please make sure you send in the correct amount for the number of samples you collect and send.

How can I pay?

You can pay by cheque (please make cheque payable to Royal Veterinary College) or credit or debit card by filling in the second page of the submission form. All credit / debit card details are confidentially shredded after use.

How long do results take and how will I receive them?

Results take between 2-3 weeks. To make the cost more affordable to owners we have to run the samples in batches. Results are sent via email. Please check your junk boxes if you think you haven't received your results.

Do you offer a faster turnaround?

Yes. We offer an expedited service for £260 per sample. Results are available within 48-72 hours of the sample being received. For the expedited service we require payment by credit/debit card and cannot accept cheques for this service. This service currently suspended due to Covid-19.

Can I upgrade my sample from the standard to the expedited service?

Yes. If you wish to upgrade your sample please email neuromuscular@rvc.ac.uk giving your name, when you sent your sample in and your postcode. You will be sent an invoice to pay for the cost difference between the standard and expedited service. Please note this email address can only be used to upgrade your sample service. We regret other enquiries cannot be answered as the laboratory is extremely busy.

Do I need to send my sample chilled or with wet tissue?

No. Please send samples to arrive at the lab the next day and at room temperature. It is preferable to collect the samples after dry weather so that they are dry, if possible.

Can I discuss my results or hypoglycin A testing with you by phone?

Unfortunately, due to staffing limitations, the Comparative Neuromuscular Diseases Laboratory is unable to discuss individual results or atypical myopathy testing in general by telephone or email. We do provide generic advice on each result sheet about how to interpret your test result and give advice and information about atypical myopathy on our owner information sheet as well as here in

the frequently asked questions (FAQ) document. Please take some time to look through the rest of these FAQ. We recommend that you contact your own vet if you have specific further queries.

If my sample isn't analysed as soon as you receive it, won't it degrade?

No. As soon as we receive your sample it is logged and frozen so that when tested it is in the same condition as when we receive it.

How accurate is the test?

The test we use exceeds industry standards and is highly sophisticated and extremely accurate, reliable and reproducible.

Can I send samples from outside the UK?

Yes. Please follow the instructions as usual and send to the lab using a next day delivery service.

Can I cancel the test once I have sent in samples?

Unfortunately not, as we run the test as soon as we fill a batch we can't guarantee exactly when your sample will enter the processing phase.

Can I add additional plant material to my original sample once I've sent it?

If your original sample hasn't entered the processing phase it is possible to add material to the sample however we can't guarantee this.

How do I check you have received my sample?

The laboratory is extremely busy so it isn't possible to let every owner know that we have received their sample. Please assume your sample has been received. If you haven't received results after one month (standard service) or 72 hours (expedited service) please check your junk email. If you still cannot find results please email neuromuscular@rvc.ac.uk. Please note this email address can only be used to check for missing results. We regret other enquiries cannot be answered.

What information will I get from this test?

You will receive an actual value for the amount of toxin contained in your sample. There will also be information on how to interpret your result and advice on what to do next.

How do I interpret the result?

Use your result to work out where the value falls in one of the 5 categories listed on the second page of the report. Once you have worked out which category it falls into, follow the advice listed under each category (at the end of the report). If you have additional questions, please contact your own vet for advice. Unfortunately, the neuromuscular laboratory does not have the staff to be able to handle additional questions. We are actively researching many pertinent questions for this disease and we will release those results as soon as we have these important answers.

How do I remove the toxic plant material from my grazing?

If you have fallen leaves and seeds you can either rake these up and dispose of them or use a paddock vacuum cleaner. Seedlings can be mowed or sprayed using weed killer. Your vet can recommend a safe weed killer for use with grazing paddocks. We recommend you collect any sprayed or mowed seedlings as they may remain toxic. If you are thinking of removing the sycamore tree(s) from your pasture speak to the forestry commission to ensure there is no preservation order.

If I can't remove all of the material, how do I reduce the risk to my grazing horses?

Fence off affected areas, provide good quality hay in the field and limit the amount of time horses spend on the pasture.

Do sprayed/mowed seedlings remain toxic?

This is something we are working on answering with our further studies. For now, we recommend assuming sprayed and mowed seedlings do remain toxic and to collect them after spraying/mowing.

How do I know if my horse has eaten the plant material containing the toxin?

We also offer a blood test to assess the level of the toxin and its metabolite in horses. You need to contact your vet to have this done.

I'm worried about my horses grazing pasture where sycamores are present. What should I do?

If your horses are off colour, weak or sluggish, contact your vet immediately even in out of hours. Early intervention in atypical myopathy and removing horses from the source of the toxin is essential. If your horses are acting normally, talk to your vet during open hours to discuss your concerns or submit samples to us for testing. Your vet might want to run a blood test to see if there is "sub-clinical" or low level of toxin exposure.

My horses have grazed the same land for years without problems, is there really a risk?

Yes there is. There have been reports of atypical myopathy occurring in horses which have been on the same pasture for years. There is no rule as to why some horses are affected or not affected.

Will seedlings always test high?

No. Seedlings from trees other than sycamores are unlikely to contain the toxin, HGA. However there is a trend for seedlings to have higher amounts of toxin than seeds or leaves from sycamore trees. At present, we do not know the reason that some seedlings contain higher amounts of toxin than others – this is something we are actively researching.

Will you update owners with more information as you discover it in your research?

Yes. We will publish the results of our continuing research so that owners can understand more about atypical myopathy and how to reduce the risk.