

# My Journey into Microscopy

*(a very practical use for my scope)*

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Wizard and Star are my two pet horses, like all equines they get internal parasitic worms which are not good for them at best and can be fatal at worst. So it's a management issue for all caring owners.



Traditionally parasitic worms weren't as much of a problem as they are today. Mixed grazing with other grazing animals helped 'mow' the larvae up without damaging the other as they are host specific. There was more land available, and perhaps ignorance meant horses weren't (de)wormed that much but may have had large unknown worm burdens. As horse care changed a routine of (de)worming every horse four times a year whether it had worms or not became accepted good practice. A lot of people still do this and are not helping the problems we now have.

Resistance to the various chemicals used in wormers (anthelmintics) has developed. There are an increasing number of horses with a worm burden that will not respond to the modern chemicals in (de)wormers. This is largely the result of dosing when it is not needed or using the wrong dosage. The resistant larvae are eaten on a blade of grass by another unsuspecting horse and the beginning of a new problem starts.

*Very briefly the cycle is*

*Eggs in dung are deposited on the field-> Eggs hatch and go through larval stages L1, L2 and at L3 reach blades of grass-> horse eats grass -> larvae continue a destructive journey throughout the horse ending up in the gut as adult egg laying worms.*

Now owners can readily get a Faecal Worm Egg Count (FWEC). You simply collect a small sample of fresh dropping, send it off to a lab or give to your vet, they analyse the sample and send you back a response in egg – eggs per gramme. A good result would be from zero to say 200, much over that the current thinking is

you should use an anthelmintic. And, ideally, to check it has worked, have another FWEC a couple of weeks later when the result should be around zero.



Image of a strongyle egg. The clearly defined circles are air bubbles. Shown with part of the McMaster slide grid. Objective 10X.

Of course in between the analyses, those eggs that have landed in huge numbers on your pasture in droppings have developed into larvae which are being ingested by your horse again. So the cycle continues. Many owners will 'poo pick' every day to keep the pasture clean and that is a major part in the fight against parasitic worms.



poo picking –  
a daily chore

I've had Wizard and Star a long time during which I have spent a lot of money on FWECs. Frustratingly, and in contradiction of what I would expect, despite a never ending routine of poo picking, Wizard has a worm burden, while Star doesn't. You'd expect Star to ingest Wizard's worm larvae and become infected, but not so. The ongoing saga for Wizard is..... I get a FWEC, it shows he has a too high positive result, I use an anthelmintic. Some weeks later I get a second FWEC with a zero result and then some months later when I test again he has a worm burden and he's dropping eggs all over his pasture. He may have resistant worms living in his gut and passing on their genes to their offspring.

I must have been looking up something on the Internet when I came upon how these tests were undertaken. I had never thought about doing it myself before. Never thought about the process either. And somehow I then found David Walker at Microscopy-UK. I wrote him a very simple apologetic email asking about

microscopes, could he help me, I hadn't been near a microscope for 50 years. I wasn't expecting a reply. But he did and it contained a link to [horsetalk.co.nz](http://horsetalk.co.nz) which described how to do a DIY test. From there I became the proud owner of a microscope, a special gridded egg counting slide, and all the other bits of equipment needed. Now with David's help I have even added my camera to the process so I can photograph the results.

<Editor's note. Using the author's Sony W55 with its compact 3X optical zoom fixed lens which is well suited for photomicrography by supporting over the eyepiece. See this [Micscape Topical Tip](#) using the similar Sony P200.>



'The lab' aka the utility room with equipment ready to use. Centre front McMaster slide – more details of this below.

The process involves adding a small quantity of dung to flotation solution, sieved to remove excess materials and then using a Pasteur pipette to gently ease it into the McMaster slide.

The McMaster slide is an essential for this job if you want an accurate count. It's about 3 normal slides thick, a bottom one and a top one and some joining material in between to create two open sided chambers and it's made of plastic. You can hold it at an enough of an angle to get the solution in, and as I discovered via some friendly advice, the fluid stays in place through surface tension. Because it's so thick you can only use a maximum 10x objective for a total optical magnification with eyepiece of ca. 100X. The grids are the counting areas.



I have taken a lot of advice from my vet, done an enormous amount of research, had help from some lovely people and I'm still to come across anything but strongyle eggs but they should account for the vast proportion of eggs to be found. Interpreting the results is very much a vet's job. But what it does mean is that I can egg count any time I please, and if in doubt of what I have found, photograph and email it to my vet.

At the moment both horses have Nil counts, but I now do a FWEC for Wizard twice a week waiting to see if the problem will come back. (We are hoping not as the vet provided an old style anthelmintic which worms shouldn't be resistant to). And I can check Star to make sure he is still clear too.



Comments to the author J. Clark are welcomed via the Micscape Editor,  
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Published in the May 2015 issue of Micscape Magazine.

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