



Presented by

ROSSDALES EQUINE PRACTICE

Beaufort Cottage Stables,
High Street, Newmarket,
Suffolk CB8 8JS.

Tel: 01638 663150

www.rossdales.com


What can a **urine** sample tell us?

Perhaps not the most glamorous of topics but examination of urine can tell us a surprising amount about a horse's health. In addition to identifying problems within the urinary system itself, urine testing can also indicate health issues affecting other parts of the body.

Urine is usually passed from a horse in fairly substantial volumes and in a continuous stream while the horse adopts a typical posture, which all horse owners will recognise! Any variation from this normal behaviour may suggest a potential problem. For instance, if the horse appears uncomfortable or strains to pass urine, only passes small quantities at a time or dribbles urine involuntarily, this could indicate potential problems such as urinary obstruction or incontinence and will require veterinary investigation. Normal horse urine is most frequently yellow to near colourless but can often appear 'creamy' coloured; this may be seen just at the start or the end of the stream and occasionally throughout. This change is due to the presence of calcium carbonate crystals in the urine, which is quite normal in horses. These crystals sit in the bladder and their place in the stream of urine simply reflects their position within the urinary tract. In cats and dogs urinary crystals are usually a concern but

in horses they do not cause problems most of the time; only on rare occasions do they result in cystitis. Sometimes small crystals join together to form bladder stones (**Fig. 1**) and if these get very large they can cause partial or complete obstruction. Occasionally, crystals or stones can damage the urinary tract wall and cause the leakage of blood into the urine.

Urinalysis

Urinalysis is a relatively simple, cheap and useful diagnostic test that can be used to check for a variety of conditions. Many substances circulating in the blood eventually make their way into the urine, where they may be detected. Like human athletes, performance-enhancing drugs may also be detected in the urine. If you need to collect a urine sample for testing, a mid-stream sample, in a clean container, is best, but any sample collected this way will be of limited value when looking for bacterial infection as it is usually contaminated on its way out of the body. Urinary tract catheterisation (**Fig. 2**) provides a more representative, uncontaminated sample but requires sedation in most cases. Ideally the sample should be examined within about 20-30 minutes of collection or be chilled to avoid changes that may alter



Fig. 2: Urinary catheterisation of a sedated gelding

the result and therefore the diagnosis.

Macroscopic examination

Direct visual observation of a urine sample is the first part of urinalysis. Excessive cellular material, excess protein or crystals may cause cloudiness. Discolouration of the urine can provide useful clues to the likely problem; red urine due to the presence of blood (haematuria) is most commonly associated with urolithiasis (crystals or stones, as mentioned above), urinary tract infections (e.g. cystitis), drug toxicity and neoplasia (cancerous growths) and less frequently with tears in the urethra (the tube that connects the bladder to the outside). The appearance of abnormal pigments can also cause marked discolouration of the urine; this is most frequently associated in



Fig. 1: A 13cm x 9cm bladder stone removed from a patient which presented with blood in its urine and evidence of discomfort when urinating! The narrow part is moulded by the bladder neck, into which this stone would have been forced when the horse urinated, creating a ball valve effect.



Fig. 3: Urine on left from a horse with post-exercise muscle damage. Normal urine on right.

horses with muscle damage. Tying up (often referred to as 'Monday Morning Disease' or 'Exertional Rhabdomyolysis'), the result of exercise-induced muscle injury,

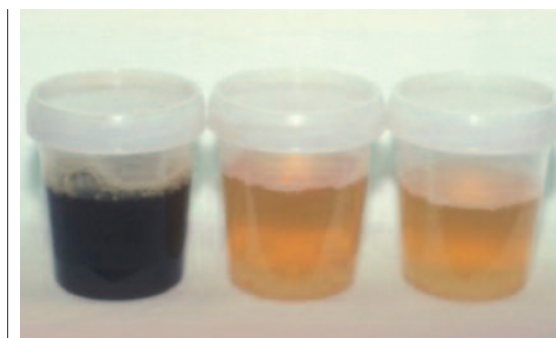


Fig. 4: Brown urine (left) taken from a horse with Atypical Myopathy. Unfortunately, these horses rarely recover, even with intensive therapy.

results in a red-brown discolouration of the urine (**Fig 3**). Atypical myopathy (the result of muscle damage caused by Sycamore poisoning) also results in a dark brown discolouration of urine (**Fig 4**).

Some changes, such as those associated with certain drugs,

food supplements, food dye and plants like beetroot, are benign but can result in quite an alarming spectrum of colours, from vivid orange to pink. Less benign, but no less dramatic, are certain rare urinary tract infections that can result in purple urine.

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VET PROFILE



Mark Grant MA VetMB
BSc PhD CertAVP(ED)
BAEDT MRCVS
RCVS Advanced
Veterinary Practitioner in
Equine Dentistry; BAEDT
practical examiner

Qualified: University of
Cambridge, 1997.
Main interests: Mark is
responsible for the sport
and leisure horse clients
at Rosssdales. He spends
most of his time
providing a
comprehensive range of
equine ambulatory
services including
lameness evaluation,
non-thoroughbred stud
work, etc. He enjoys all
aspects of veterinary
practice but his special
interests are internal
medicine, ophthalmology
and dentistry. In addition
to a large routine dental
caseload, Mark also
spends some of his time
at Rosssdales Equine
Hospital where he sees
dental referrals (for tooth
extractions, restorations
and endodontics).



Fig. 5: Dipsticks



Fig. 6: Refractometer

Urine Dipstick Chemical Analysis

This is usually the next step in urinalysis. A dipstick is a paper strip with patches impregnated with chemicals that undergo a colour change when certain constituents of the urine are present or in a certain concentration (**Fig 5**). A urine dipstick may be used to assess pH, protein content, glucose, bilirubin and the presence of pigments. Normal horse urine is alkaline and should not contain protein, glucose or bilirubin, so the presence of these would indicate further investigation (e.g. blood testing) was required.

Specific gravity

Specific gravity (SG) is determined by the presence of solutes and essentially it is a measure of concentration. A refractometer (**Fig. 6**) is used to measure the SG of the urine. Highly concentrated urine, which may appear dark yellow, has a high SG and is often caused by decreased water in-take or dehydration. At the other end

of the spectrum, very dilute, almost water-like urine has a low SG and may be associated with excess water intake, which can indicate certain diseases, such as diabetes (rare in horses) or kidney disease. Foal urine is normally very dilute compared to adults.

Microscopic examination

Next, the urine is centrifuged (spun at high speed) so that all the cellular material is driven to the bottom of the tube. A drop of urine sediment examined under the microscope reveals useful information about the cell types present in the sample and is important in identifying evidence of inflammation and infection.

So, as you can see, something that your horse does regularly and to which you may have never given a thought, can in fact tell you a lot about their overall health and be an early indicator of a health problem. It pays to keep an eye on the less glamorous end of your horse!