

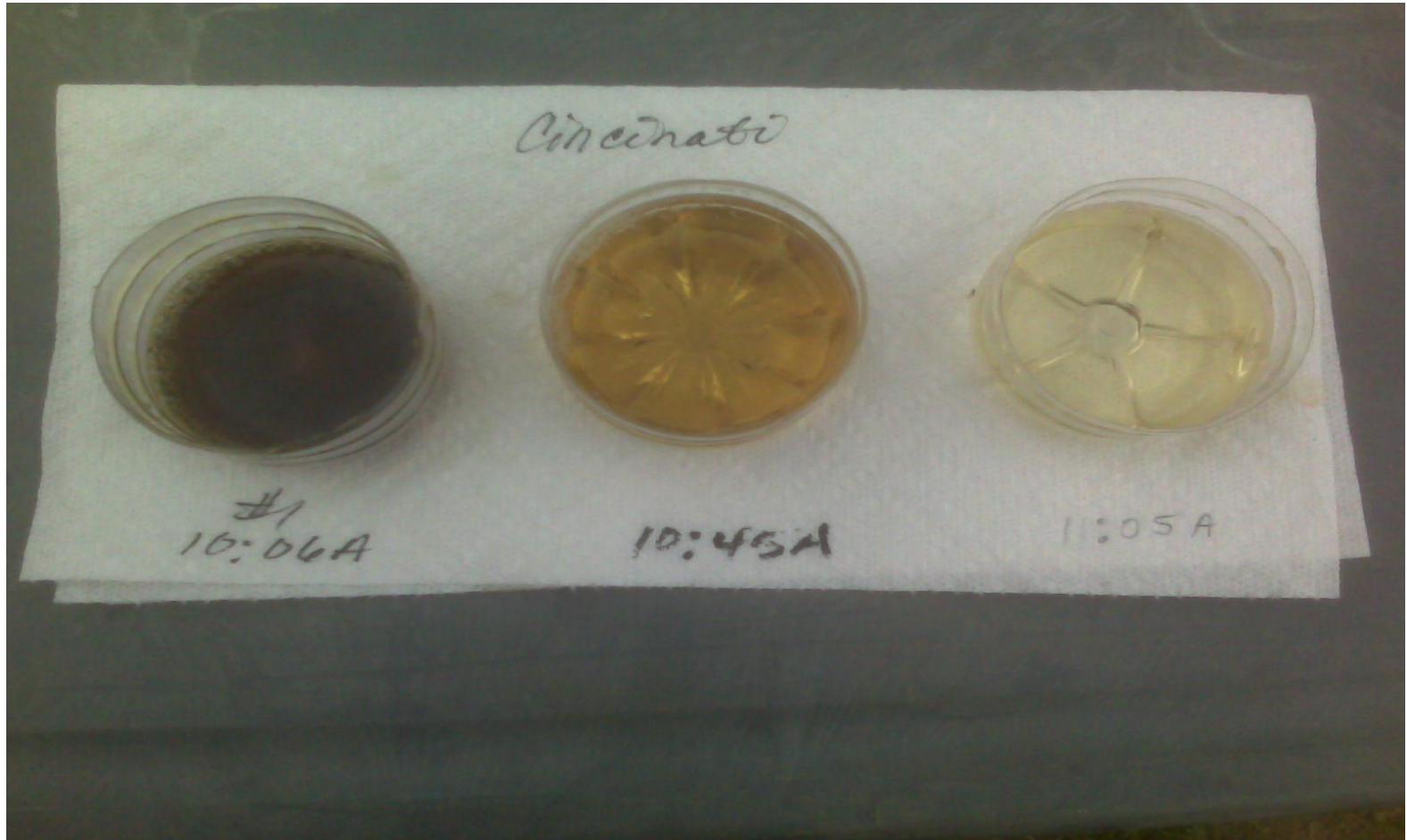
Exertional Rhabdomyolysis and urine color in endurance horses

I have been collecting samples of urine from endurance horses over the past two years and trying to look for some type of color/value/test that might serve as a means of predicting myositis events or other problems that might occur as a result of endurance competition. The variation found in urine color has been tremendous. Elevated bilirubin and ketones consistently showed on field urinalysis done with Multistix 10 SG and, while most horses that had problems (colic, muscle spasms, rhabomyolysis, ect.) had coffee colored to dark brown to red urine there were numerous notable exceptions where relatively normally colored urine came from horses in trouble and **very** abnormally colored urine was produced by horses that finished rides and, in some cases, finished in the top ten. Any thoughts, observations and ideas on this material would be greatly appreciated along with any references or further reading that might be helpful. Feel free to use these slides if they may be of value and if you would like any without inserted printing please let me know.

Respectfully,

K.L.Marcella DVM

This is a horse that suffered a mild myositis episode at Biltmore 08- Initial urine, post 10 liters of fluids IV, post 15 liters. This is the typical presentation and progression of most endurance myositis cases. Note that the last urine sample is diluted and only a yellow-red tint





National Championship Sept. 08- This horse pulled at 37 miles. Initial urine, post 20 liters, post 30 liters. Still tight, enlarged gluteal muscles bilaterally but stable, eating and drinking and did well and resolved over the next 36 hours. Even the diluted urine in this case shows more reddish color. Is this possibly more hemoglobin from exercise induced bladder trauma that may be a “normal” consequence of endurance events?

Biltmore 08- More heavily muscled horse at initial tie up. Treated with 30 liters of fluids and did fine.

Breaker



Is there any correlation between degree of muscle mass and intensity of myositis event or amount of myoglobin and intensity of darkness of urine?

H: 10 A

YellowHammer 08- High CRI, pulled at 24 miles, sole bruise and RH med. Quad strain no treatment needed

Mild Myoglobinuria? Do you feel that these urinalysis sticks have any validity in horse urine? I have gotten consistantly higher bilirubin, ketones and +/- proteins in tie-ups but surprisingly almost no blood even in very reddish (not brown) urine.





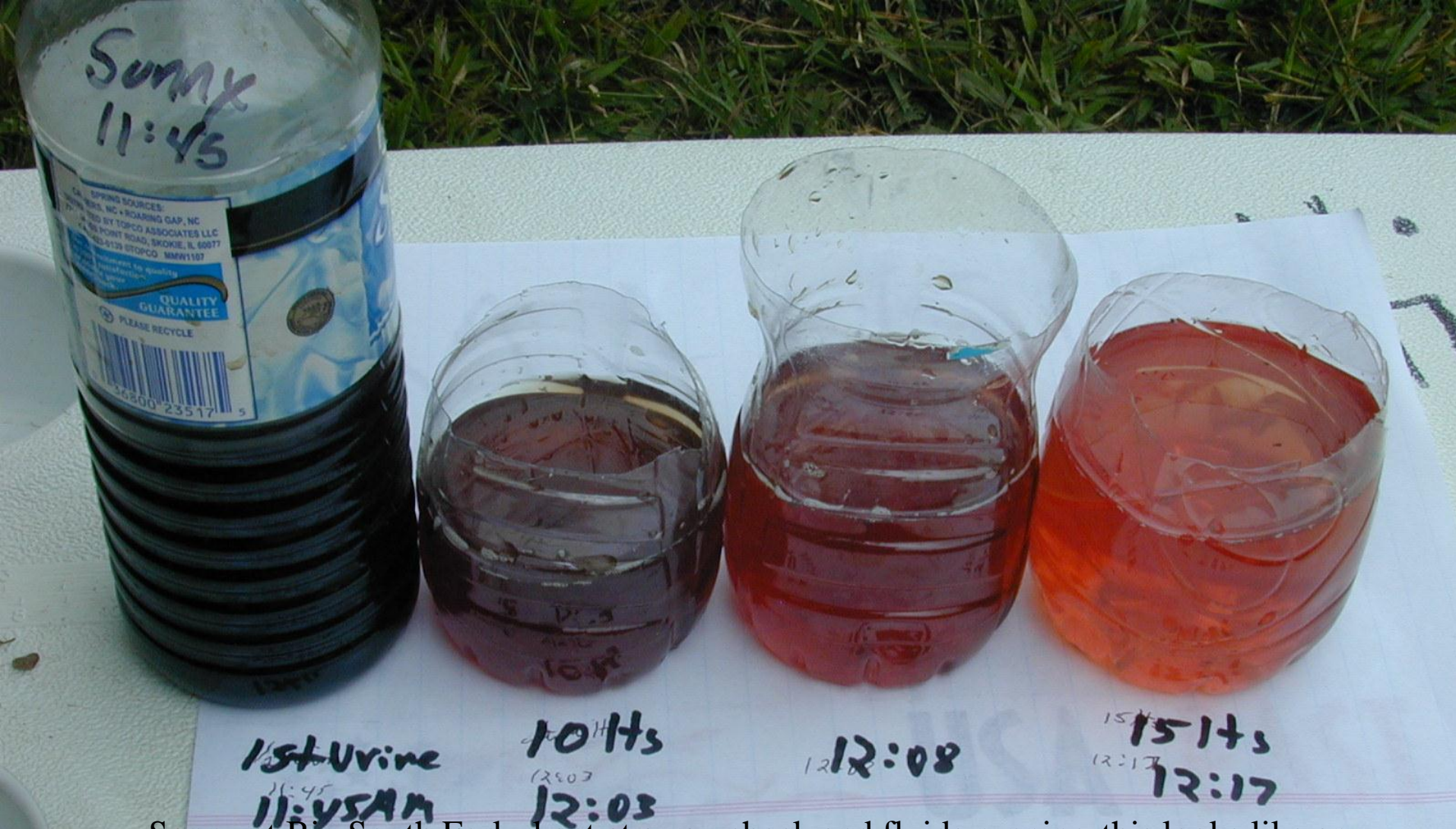
YellowHammer 08- loop 1 (19 miles)- Urine from 3 different horses. All did fine but I wonder about the white color on the first urine, the second seems very dilute for a horse that is not yet drinking, and the last is more concentrated- more normal for horses at this stage of a ride- Comments?



National Championship- tied-up on loop 3 (52 miles)- cramping and muscle spasm-abdominal muscles and intercostal muscles on the Rt side- initial urine, post 20 liters, post 30 liters.
Myoglobinuria to hemoglobinuria?

Sonny at Big South Fork —tied up and started on fluids at the
away vet check- 19 miles





Sonny at Big South Fork- kept at away check and fluids running-this looks like an example of myoglobin flushing to hemosiderin. This horse took much longer to resolve and was still stiff a few days later but no residual problems. I am trying to get a handle on the variation in these cases- are there perhaps multiple types of myositis cases that look similar? Is the combination of myoglobin and hemosiderin harder for the body to handle?



Sonny at Big South Fork- continued progression away from brown and toward more rose colored urine. It was unusual for a tied-up competition horse to urinate this frequently- even on rapid IV fluids.



Sonny at Big South Fork- clearing urine – This horse cleared quickly with less fluids but was more affected muscularly than other horses that took more fluids to clear and longer time but that resolved their muscle issues quicker- again are we seeing variations on a theme? All these horses had elevated CPK and ALT but not much difference from horses that successfully completed the same rides.



1st Urine
11:45 AM

10 Hts
12:03

12:08

15 Hts
12:17

Sonny at Big South Fork- this series really shows the progression (I think) from myoglobin to hemosiderin and, if horses parallel other athletes, nearly 90% of equine athletes have either clinical or sub-clinical blood in the urine post exercise. Comments?



National Championships 08- This is urine from a horse at 37 miles. This horse did fine, finished in the middle of the field and required no treatment. How does this degree of myoglobinuria not translate to a tie-up incident especially when compared to the next three slides?

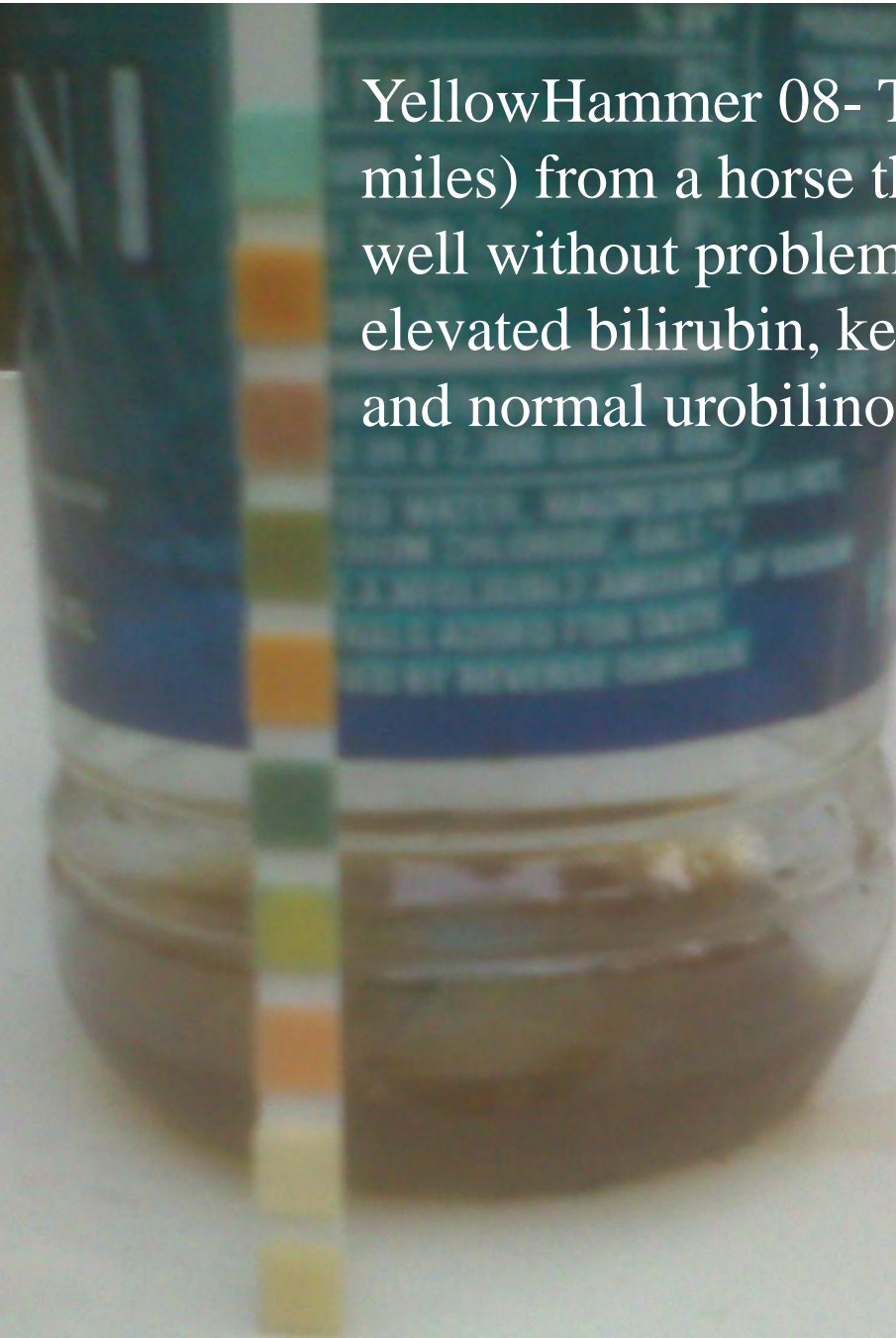


National Championship 08- this horse had low gut sounds at 37 miles and was pulled and eventually required fluids but recovered well after approx. 25 liters.



National Championships 08- Urine from another horse at the second check (37 miles). This horse also finished in the middle of the field, had no problems and required no treatment. How should vets advise riders when dark urine like this is observed in a horse that is otherwise doing well? What predictive value does urine color (content) have? Do we make too much of it? Is there something that we are missing that differentiates problem cases from those horses that handle muscle damage well?

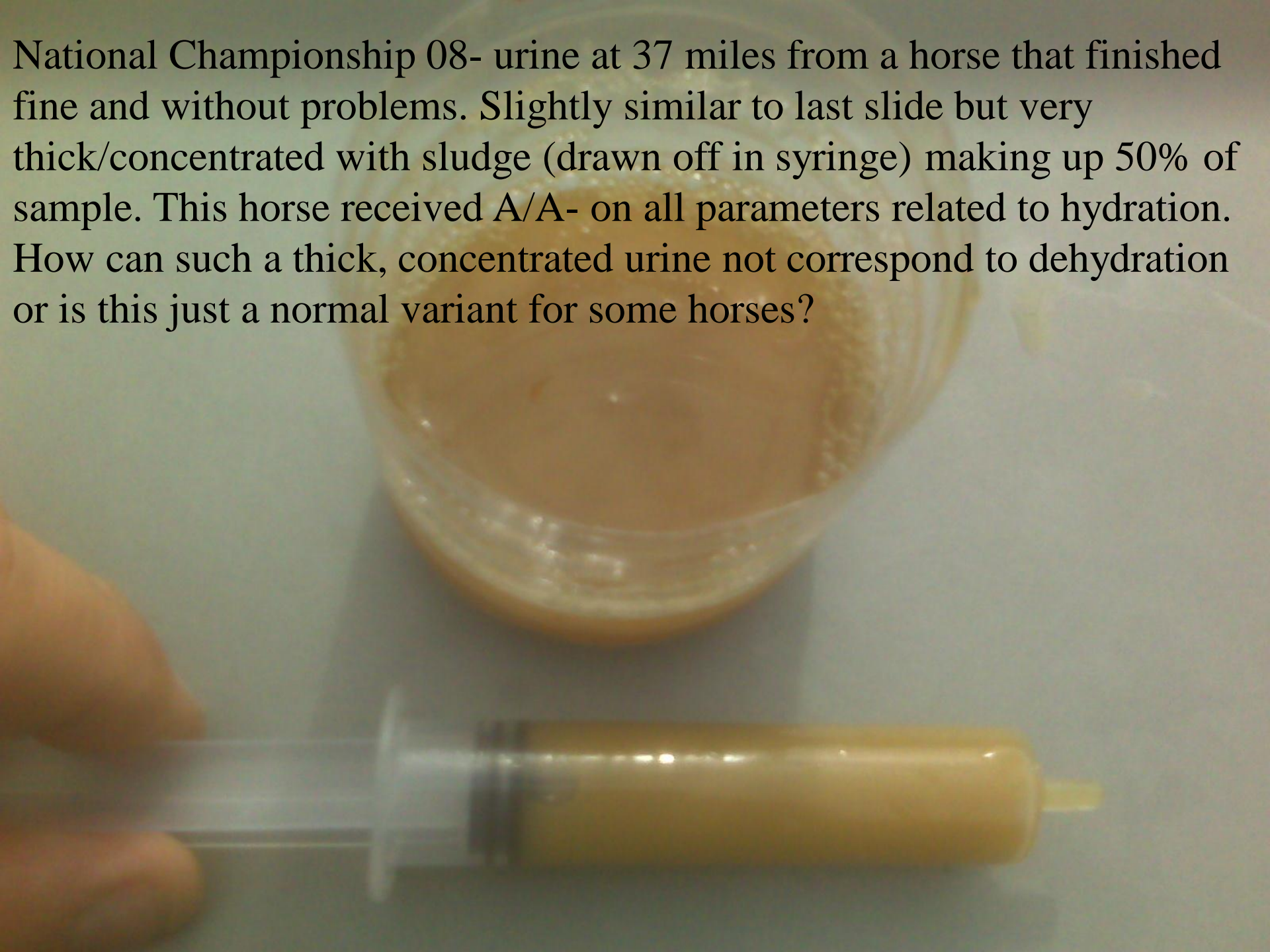
YellowHammer 08- This urine (at 19 miles) from a horse that finished and did well without problems or treatment. Again elevated bilirubin, ketones but no blood and normal urobilinogen. Why?



National Championship 08- Urine at 52 miles from a horse that did well and finished fine. Unusual orange/yellow color and thick. Any thoughts on urine like this?



National Championship 08- urine at 37 miles from a horse that finished fine and without problems. Slightly similar to last slide but very thick/concentrated with sludge (drawn off in syringe) making up 50% of sample. This horse received A/A- on all parameters related to hydration. How can such a thick, concentrated urine not correspond to dehydration or is this just a normal variant for some horses?



YellowHammer 08- urine from first
vet check (19 miles). Horse doing fine
and finished without problem. Any
thoughts on milky white urine?
(Protein - one plus)

