

# Equine Pharmacology, Therapeutics and Toxicology [ Forensic/Equine]



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# **Canadian Environmental Methamphetamines Identifications Linked to a Horse Trailer**

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**Maxwell H. Gluck Equine Research Center  
University of Kentucky**

for the

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[\*\*www.hbpa.org/resources/MedicationPolicy.pdf\*\*](http://www.hbpa.org/resources/MedicationPolicy.pdf)

# **SUMMARY**

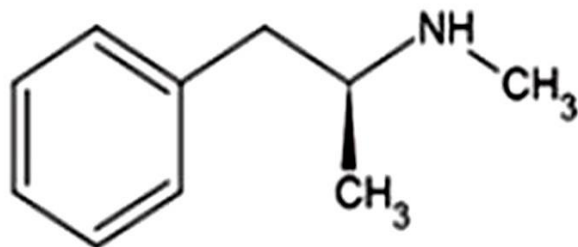
## **CANADIAN METHAMPHETAMINES**

- 1/ EIGHT LOW CONCENTRATION URINARY METHAMPHETAMINE IDENTIFICATIONS IN 2014, INVOLVING THREE TRAINERS.**
- 2/ > HALF OF THESE POSITIVES OCCURRED IN TWO “CLUSTERS”.**
- 3/ ONE CLUSTER OF THREE POSITIVES IN 48 HOURS LINKED TO A METHAMPHETAMINE IDENTIFIED IN A HORSE TRAILER.**
- 4/ METHAMPHETAMINE IS THEREFORE A POTENTIAL ENVIRONMENTAL CONTAMINANT FOR RACING HORSES.**
- 5/ ANALYTICAL “CUT-OFF” FOR METHAMPHETAMINE IN THE LOW NG/ML RANGE IS NEEDED.**

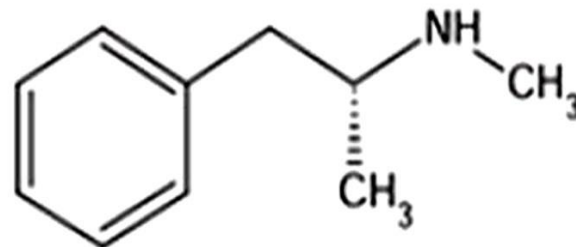
# METHAMPHETAMINE

- 1/ METHAMPHETAMINE IS A CNS STIMULANT AND A CONTROLLED SUBSTANCE IN CANADA AND THE US.
- 2/ EXISTS AS *d*- AND *l*-METHAMPHETAMINE, *d*- FORM MOST PHARMACOLOGICALLY ACTIVE, *l*- FORM IS AVAILABLE OVER THE COUNTER.
- 3/ MODERN INSTRUMENTAL TESTING FOR METHAMPHETAMINE IS >1,000 FOLD MORE SENSITIVE THAN ELISA TESTING .
- 4/ NOW POSSIBLE TO SCREEN AND CONFIRM AT 50 PICOGRAM/ML CONCENTRATIONS IN PLASMA AND URINE [??].
- 5/ SINCE METHAMPHETAMINE IS WIDELY USED BY HUMANS, INADEVERTENT ENVIRONMENTAL EXPOSURE OF HORSES TO METHAMPHETAMINE MAY OCCUR AND IS EASILY DETECTABLE.





*d*-methamphetamine  
dextro-methamphetamine  
S(-)-methamphetamine



*l*-methamphetamine  
levo-methamphetamine  
R(+)-methamphetamine

# METHAMPHETAMINE

Exists as two enantiomers, *d*-methamphetamine and *l*-methamphetamine. *d*-Methamphetamine, the more active pharmaceutical, is a US DEA Schedule II controlled substance, while *l*-methamphetamine is available in over-the-counter preparations such as Vicks® Vapoinhaler™.

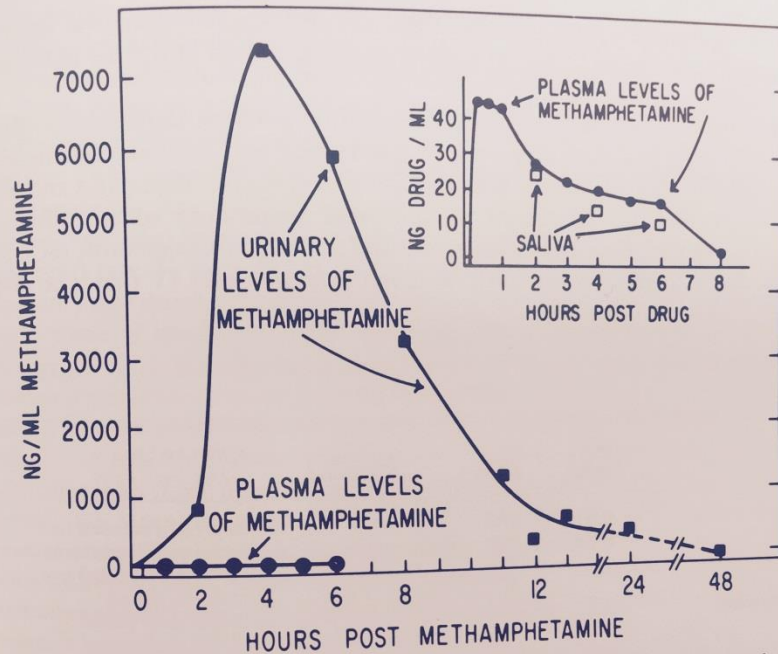


Figure 11-2. Plasma, saliva, and urinary levels after intramuscular administration of methamphetamine in the horse. Horses were dosed with 150 mg of methamphetamine IM at indicated zero time. The solid squares (■) show mean urinary levels of methamphetamine, which ranged up to 200 times the levels observed in plasma (solid circles, ●). The inset in the upper right-hand corner shows the relationship between plasma levels of methamphetamine (solid circles, ●) and salivary levels of methamphetamine (open squares, □) on an increased scale. All data points represent means of experiments on eight different horses and are replotted from the work of Ray et al. Reproduced with permission from Tobin et al., *J Equine Med Surg*, 3:64, 1979.

**After IM administration of 150 mg of methamphetamine to six horses, plasma concentrations peaked within minutes at 40 ng/ml and urinary concentrations at 4 hours at 7,000 ng/ml, 175 fold higher. [ Ray et al, AJVR, 1972].**

# THE HORSE TRAILER EVENTS

1/ LARGE HORSE TRAILER PURCHASED IN MICHIGAN DAYS BEFORE THESE EVENTS.

2/ THREE HORSES TRAIERED→TORONTO, AJAX DOWNS.

3/ HORSES RACED OCT 13<sup>TH</sup> AND 14<sup>TH</sup>, WON OR PLACED ALL TESTED URINARY METHAMPHETAMINE “POSITIVE” .

4/ CLASSIC LOW CONCENTRATION URINARY “POSITIVE” “CLUSTER” OF AN ENVIRONMENTAL SUBSTANCE.

5/ RACING COMMISSION TESTED THREE SAMPLES INCLUDING A TRAILER “SWAB”. TRAILER SWAB “POSITIVE” AT 22 ng/mg.





## THE METHAMPHETAMINE “POSITIVE “ HORSE TRAILER IN CUSTODY



# **LOW CONCENTRATION “POSITIVE” CLUSTER**

**1/ CONCENTRATIONS OF METHAMPHETAMINE IN THESE  
SAMPLES REMARKABLY LOW.**

|                                  |                        |                    |
|----------------------------------|------------------------|--------------------|
| <b>Positive October 13, 2014</b> | <b>Chasing Royalty</b> | <b>0.056 ng/ml</b> |
| <b>Positive October 13, 2014</b> | <b>Fames Winner</b>    | <b>0.20 ng/ml</b>  |
| <b>Positive October 14, 2014</b> | <b>JJ Maxwell</b>      | <b>0.34 ng/ml</b>  |

**2/ VERY GOOD EVIDENCE FOR AN ENVIRONMENTAL  
SOURCE FOR THESE POSITIVES.**

**3/ NOTE: A HORSE TRANSPORTED IN A SEPARATE  
TRAILER ALSO RAN, WON, TESTED NEGATIVE**

# EXTENT OF METHAMPHETAMINE EXPOSURE

1/ CALCULATED DOSE OF METHAMPHETAMINE TO YIELD 50 PICOGRAMS/ML “POSITIVE”:

2/ 7,000 NG/ML DIVIDE BY 150 = 1 MG → 47  
NG/ML , 1/10 MG → 4.7, 1/100MG → 470 PG/ML  
THEREFORE, 1 UG → 47 PICOGRAMS/ML  
5 UG → 235 PICOGRAMS/ML  
7 UG → 330 PICOGRAMS/ML

3/ EXPOSURE TO <1/100 OF A MG, 1/150,000 OF A CLINICAL DOSE TO YIELD THE LOWEST CONCENTRATION “POSITIVE’.

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# **PHARMACOLOGICAL EFFECT??**

- 1/ EXPOSURE TO 1/15,000 OF A CLINICAL DOSE OR LESS TO YIELD THESE URINARY CONCENTRATIONS.**
- 2/ NO REASONABLE POSSIBILITY WHATSOEVER OF A PHARMACOLOGICAL EFFECT.**



# OTHER CANADIAN METHAMPHETAMINE POSITIVES

**TORONTO, JULY/AUGUST, TWO POSITIVES.**

|                           |      |             |            |
|---------------------------|------|-------------|------------|
| July 11 <sup>th</sup> ,   | 2014 | Split quant | 0.21 ng/ml |
| August 29 <sup>th</sup> , | 2014 | Split quant | 1.75 ng/ml |

**SASKATOON, AUGUST/SEPTEMBER, THREE  
POSITIVES.**

|  |           |                  |
|--|-----------|------------------|
| Three positives, only one sample “split” | 1.2 ng/ml |                  |
| August 30 <sup>th</sup> ,                | 2014      | Nickers n Lace   |
| August 30 <sup>th</sup> ,                | 2014      | Sexy Eleanor     |
| September 12 <sup>th</sup> ,             | 2014      | Vee Voom Rhules. |

# SUMMARY

## CANADIAN METHAMPHETAMINES

1/ EIGHT LOW CONCENTRATION URINARY METHAMPHETAMINE “POSITIVES” IN 2014, THREE TRAINERS.

2/ THE LOWER THE CONCENTRATION, THE MORE LIKELY THE FINDING IS TO BE INADVERTENT ENVIRONMENTAL

3/ HALF OF THESE POSITIVES OCCURRED IN TWO LINKED “CLUSTERS”.

4/ ONE CLUSTER OF THREE POSITIVES IN 48 HOURS LINKED TO A METHAMPHETAMINE CONTAMINATED HORSE TRAILER.

5/ METHAMPHETAMINE IS THEREFORE AN ENVIRONMENTAL CONTAMINANT OF CONCERN TO HORSE RACING.

6/ A CUT-OFF FOR ENVIRONMENTAL METHAMPHETAMINE IN THE LOW NG/ML RANGE IN URINE IS NEEDED.

# **THIS RESEARCH WAS MADE POSSIBLE BY SUPPPORT FROM**

- 1/ The National Horsemen's Benevolent and Protective Association.**
- 2/ The Florida Horsemen's Benevolent and Protective Association.**
- 3/ The Ohio Horsemen's Benevolent and Protective Association.**
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- 5/ The Kentucky Horsemen's Benevolent and Protective Association.**
- 6/ The Iowa Horsemen's Benevolent and Protective Association.**
- 7/ The Horsemen's Benevolent and Protective Association of Ontario.**
- 8/ The Nebraska Horsemen's Benevolent and Protective Association.**



# **THANK YOU, OR, MUCHAS GRACIAS [AS WE SAY IN TIPPERARY!]**

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- 5/ ANALYTICAL “CUT-OFF” FOR URINARY IN THE LOW NG/ML RANGE IS NEEDED FOR METHAMPHETAMINE.**



# SUMMARY

- 1/ METHAMPHETAMINE, A HUMAN RECREATIONAL SUBSTANCE.
- 2/ SYNTHESIZED IN “ILLICIT” LABORATORIES; HORSE TRAILERS?
- 3/ IN MICHIGAN, A RECENTLY PURCHASED HORSE TRAILER WAS USED TO TRANSPORT HORSES TO TORONTO TO RACE AT AJAX DOWNS.
- 4/ HORSES SO TRANSPORTED WON AT AJAX DOWNS, TWO ON OCTOBER 13<sup>TH</sup>, ONE OCT. 14<sup>TH</sup>, TESTED URINE “POSITIVE” FOR METHAMPHETAMINE.
- 5/ UNUSUAL “CLUSTER” OF POSITIVES: THE ONTARIO COMMISSION TESTED THE TRAILER FOR METHAMPHETAMINE, IT CAME UP “POSITIVE”.
- 6/ THESE FINDINGS SHOW THAT HORSES WILL TEST “POSITIVE” FOR TRACES OF METHAMPHETAMINE AFTER INCIDENTAL ENVIRONMENTAL EXPOSURE, AS IS WELL KNOWN TO OCCUR IN HUMANS.