PRE-RACE EXAMINATIONS,INJURY RATES, THRESHOLDS FOR PHENYLBUTAZONE: A PRELIMINARY ANALYSIS AND OPINIONS

Thomas Tobin
and
[Rich Harden]

Professor, The Maxwell H. Gluck Equine Research Center
University of Kentucky, Lexington, KY

Equine Medical Director, Virginia Racing Commission,

New Kent, Virginia, 23124

NATIONAL HBPA SUMMER MEETING, MINNEAPOLIS, MINNESOTA

Friday, July 23rd, 2010 9AM

www.thomastobin.com

Dr. Tom V. David, April 2009, "Views on Medication"

"*Our allowable levels of therapeutic medications on race day make it extremely difficult to determine the health and soundness of the animal when a pre-race exam is conducted"* and he goes on to note that "*non-steroidal and corticosteroids should not be administered within a minimum of 48-72 hours prior to racing*".

Dr. Tom V. David, April 2009, "Views on Medication"

This proposed inability of regulatory veterinarians to perform effective prerace examinations is, in turn, thought to lead to an increased incidence of Fatal Musculoskeletal Injuries associated with the currently widely used 5 mcg/ml regulatory threshold for phenylbutazone.

Dr. Tom V. David, April 2009, "Views on Medication"

More importantly, as required by the rule change procedure, we respectfully note that there is no relevant quantitative statistical information whatsoever in Dr. David's viewpoint communication, and no suggestion that this information will be available anytime in the near future.

It should also be noted that Dr. David suggests the withdrawal time for phenylbutazone should be adjusted to 48 or 72 hours, and not the 24 hours proposed in the ARCI proposed rule change. Dr. David apparently has no scientific information whatsoever to base his opinions on and it is equally interesting that he is quite approximate ["48 or 72 hours"] in his opinions as to an appropriate withdrawal time for phenylbutazone.

Dr. David also expresses the opinion that "medication can be changed overnight", a comment which is inconsistent with the scientific, forensic and regulatory processes underlying scientifically and forensically correct therapeutic medication regulation.

SUMMARY

1/ LITERATURE: No demonstrated value for the pre-race inspection with regard to prophylactically excluding horses from competition [Cohen 1997].

2/ Lack of evidence for relationship between FMI rates and phenylbutazone thresholds [Colonial Downs].

3/ At this time, we lack evidence that 2 ug/ml is a scientifically valid 24 hour threshold.

4/ A well established rule in place. At this time, difficult to consider that we have a scientific basis for changing the threshold for phenylbutazone from 5 to 2 mcg/ml.

PRE-RACE INSPECTION AND EXCLUDING HORSES FROM RACING

LITERATURE, Cohen et al, 1997: No demonstrated value for the pre-race inspection with regard to prophylactically excluding horses from competition

KENTUCKY PRE-RACE EXAMINATION, COHEN, 1999

[January 1996 to October 1997]

As such, they considered that excluding all horses judged to be at increased risk of injury on the basis of the pre-race physical examination would be unreasonable, because the prerace inspection summary assessment score lacked the required specificity to form the basis for excluding a horse from racing.

COLONIAL DOWNS

2/ Lack of evidence for relationship between FMI rates and phenylbutazone thresholds, recent Colonial Downs data.

COLONIAL DOWNS PHENYLBUTAZONE

1997->2004, THRESHOLD 2 MCG/ML

2005->2008, THRESHOLD 5 MCG/ML

BELIEF THAT 5 MCG/ML INCREASED FMI RATE

2009->2010, RETURNED THRESHOLD TO 2 MCG/ML

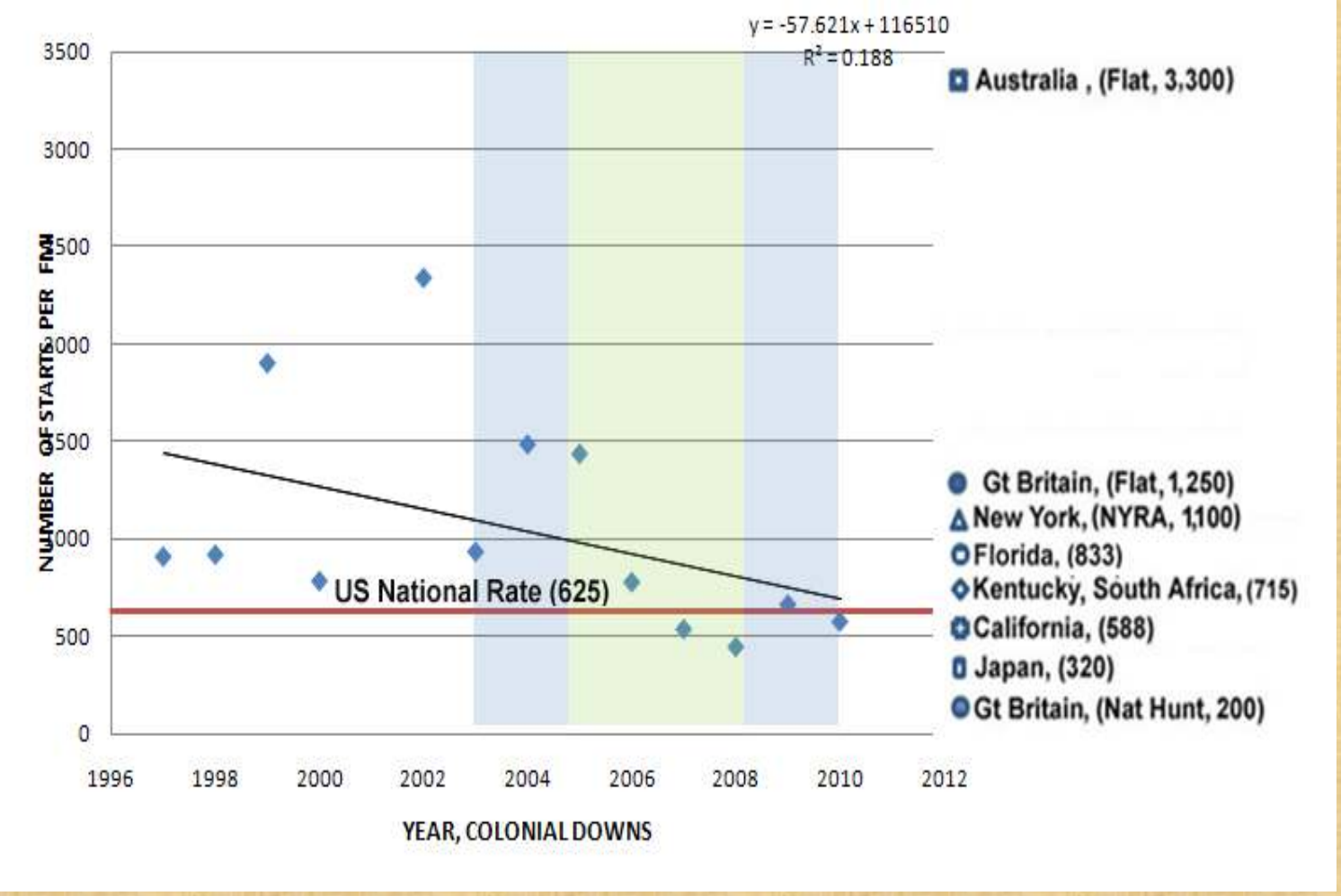


Fig 1: The diamonds show the number of starts per year at Colonial Downs per FMI. The black line shows the least squares regression fitted to these data points, the red line the reported US national FMI rate,[ERIRS 1992]. The right-hand symbols show reported FMI rates from, respectively, Great Britain, National Hunt, Japan, California, Kentucky , South Africa, New York, Great Britain, Flat Racing, and Australia, Flat racing. The green years, 2005 to 2008, inclusive, are when the phenylbutazone threshold was 5 mcg/ml, the blue represents the four baseline years, 2003, 2004 and 2009, 2010, selected for statistical comparison four baseline years, 2003 2004 and 2009, 2010, selected for statistical comparison, 2004 and 2009, 2010, selected for comparison

JULY 23rd, 2010, AM; E-MAIL CORRECTED COLONIAL DOWNS FIGURES

Thomas,

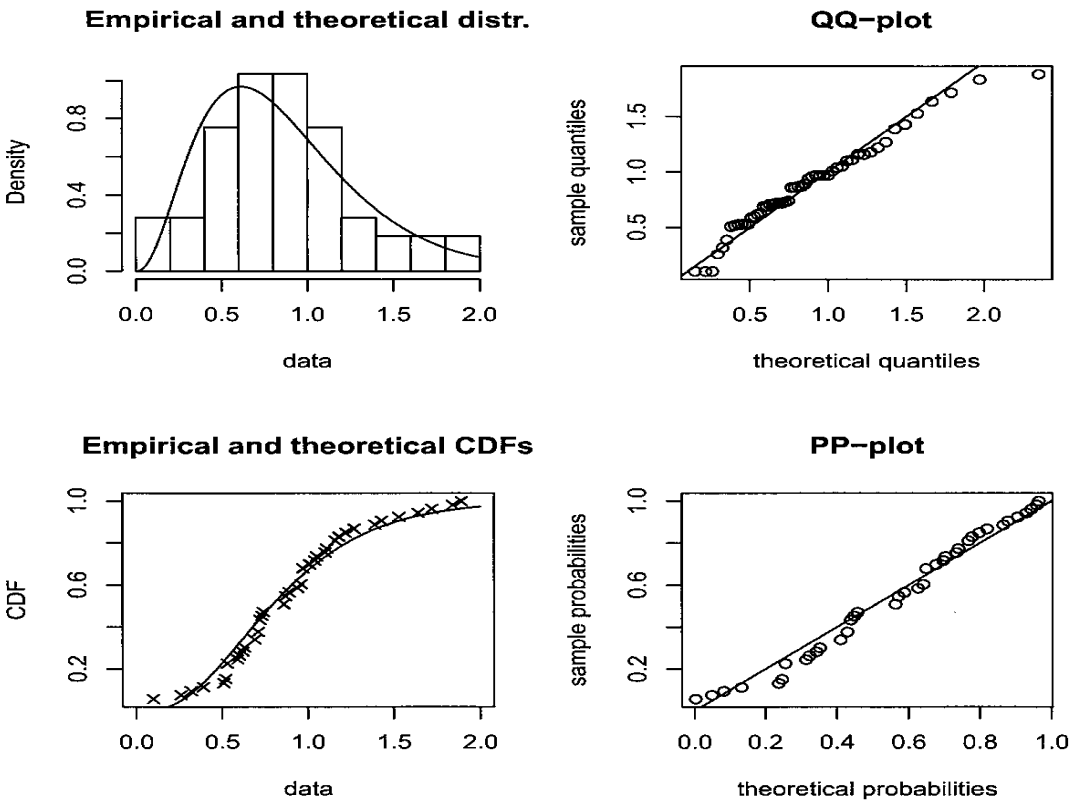
I re-ran the analysis with the new figure 4 for 2009. The **conclusions did not change**. There was however a small change in the numerical values of P-values which continue to be much larger than 0.3. Hence the change in P-values did not lead to any new conclusions.

COLONIAL DOWNS SUMMARY

1/ STATISTICAL ANALYSIS OF THE FMI RATES FOR 03, 04 AND 09,10] Vs THE 05-08 YEARS SHOWED NO STATISTICAL DIFFERENCE.

2/ DATA DO NOT SUPPORT SUGGESTIONS THAT FMI RATES DIFFER DEPENDING ON WHETHER THE PB THRESHOLD IS EITHER 2 OR 5 MCG/ML.

LACK OF EVIDENCE THAT 2 UG/ML IS A SCIENTIFICALLY VALID 24 HOUR THRESHOLD



Kohrs, Keith R
hursday, April 22, 2010 1:13 PM
in, Thomas
: RE: 1983 data

has taken longer to get back to you with this. The IL data will not
ge with a gamma distribution, so it does not appear to be from a gamma.
r, it does not get rejected when tested for normality. This prompted me to
he other data sets. Those also pass the normality check. However, they
eem to have more weight in the right tail, which is more a trait of the
distribution. Although taking the average would make more sense if they
nsidered normal.

mma fit yielded the following results:
pected maximum ~ 2.617 (1 000 horses), 3.114 (10 000 horses); expected
.0 ~ 8.43 (1 000), 84.3 (10 000)
pected maximum ~ 3.252 (1 000 horses), 3.957 (10 000 horses); expected
.0 ~ 26.1 (1 000), 261 (10 000)
xpected maximum ~ 2.619 (1 000 horses), 3.115 (10 000 horses); expected
.0 ~ 8.45 (1 000), 84.5 (10 000) where AVG indicates the average of all 3
ements.

n the same type of analysis using the normal distribution if you would like.

4/ A WELL ESTABLISHED RULE IN PLACE.

At this time, difficult to see a scientific basis for changing the threshold for phenylbutazone from 5 to 2 mcg/ml.

adopting RMTC's policies.

The rules do not differentiate between 2 year olds and older horses because there was no reason to do so. The levels of the NSAID's permitted on race day are arguably well below a clinically active dosages. In fact, in California where the 5 ug/ml in plasma level has been in place for nearly 20 years, the vast majority of horses test below the 2 ug/ml level. The 5 ug/ml level simply provides a safety margin to avoid inadvertent positives.

Furthermore, only one of three NSAID's is permitted which prevents the stacking effect of multiple NSAID's. Anecdotal information suggesting a synergistic analgesic effect of multiple NSAID's is only one issue. A recent study from University of Missouri (AJVR 67:398-402 2006) demonstrated multiple NSAID's to be associated with gastric lesions supporting the RMTC position. The same study found phenylbutazone alone cause did not cause gastric lesions in their study. We found the same in a much larger clinical study at Santa Anita and Hollywood Park (ProcAAEP 40:125-126 1994; EVJ Suppl:29:34-39 1999) , specifically phenylbutazone was not associated with gastric ulcers in our race horse population.

I urge you to adopt the RMTC uniform medication guidelines as written. The RMTC guidelines protect the health and welfare of the horse and protect the integrity of racing. As a neighboring state, a uniform policy between Oregon and California only makes sense.

Respectfully,

e
992].
en
ne
3

SUMMARY

1/ LITERATURE: No demonstrated value for the pre-race inspection with regard to prophylactically excluding horses from competition [Cohen 1997].

2/ Lack of evidence for relationship between FMI rates and phenylbutazone thresholds [Colonial Downs].

3/ At this time, we lack evidence that 2 ug/ml is a scientifically valid 24 hour threshold.

4/ A well established rule in place. At this time, difficult to see a scientific basis for changing the threshold for phenylbutazone from 5 to 2 mcg/ml.

ACKNOWLEDGEMENTS:

This work was made possible by research support from The National Horsemen's Benevolent and Protective Association and the Alabama; Arizona; Arkansas; Canada; Charles Town, WV; Florida; Iowa; Kentucky; Louisiana; Michigan; Minnesota, Nebraska, Ohio, Oklahoma, Ontario Canada, Oregon, Pennsylvania, Tampa Bay Downs, Florida; Texas; Washington State; and West Virginia Horsemen's Benevolent and Protective Associations. The assistance of Mr. Kent Stirling, Executive Director of the Florida HBPA, Mr. Frank Petramalo, Executive Director of the Virginia HBPA, and Mr. Remi Bellocq Chief Executive Officer and Mrs. Laura Plato Director of Operations of the National HBPA is gratefully acknowledged.

ACKNOWLEDGEMENTS:

From the Equine Pharmacology Therapeutics and Toxicology Program at the Maxwell H. Gluck Equine Research Center and Department of Veterinary Science, University of Kentucky. Published as Kentucky Agricultural Experiment Station Article # XXXXX with the approval of the Dean and Director, College of Agriculture and the Kentucky Agricultural Experimental Station. This work was made possible by research support from The National Horsemen's Benevolent and Protective Association and the Alabama; Arizona; Arkansas; Canada; Charles Town, WV; Florida; Iowa; Kentucky; Louisiana; Michigan; Minnesota, Nebraska, Ohio, Oklahoma, Ontario Canada, Oregon, Pennsylvania, Tampa Bay Downs, Florida; Texas; Washington State; and West Virginia Horsemen's Benevolent and Protective Associations. The assistance of Mr. Kent Stirling, Executive Director of the Florida HBPA, Mr. Frank Petramalo, Executive Director of the Virginia HBPA, and Mr. Remi Bellocq Chief Executive Officer and Mrs. Laura Plato Director of Operations of the National HBPA is gratefully acknowledged.

ACKNOWLEDGEMENTS:

From the Equine Pharmacology Therapeutics and Toxicology Program at the Maxwell H. Gluck Equine Research Center and Department of Veterinary Science, University of Kentucky. Published as Kentucky Agricultural Experiment Station Article # XXXXX with the approval of the Dean and Director, College of Agriculture and the Kentucky Agricultural Experimental Station. This work was made possible by research support from The National Horsemen's Benevolent and Protective Association and the Alabama; Arizona; Arkansas; Canada; Charles Town, WV; Florida; Iowa; Kentucky; Louisiana; Michigan; Minnesota, Nebraska, Ohio, Oklahoma, Ontario Canada, Oregon, Pennsylvania, Tampa Bay Downs, Florida; Texas; Washington State; and West Virginia Horsemen's Benevolent and Protective Associations. The assistance of Mr. Kent Stirling, Executive Director of the Florida HBPA, Mr. Frank Petramalo, Executive Director of the Virginia HBPA, and Mr. Remi Bellocq Chief Executive Officer and Mrs. Laura Plato Director of Operations of the National HBPA is gratefully acknowledged.

COHEN, 1999

[January 1996 to October 1997]

1/ Evaluation of the horse's general condition.

2/ Palpation of forelimbs, carpus to hoof.

3/ Previous race history.

4/ Results of previous prerace inspections.

5/ Standardized "summary assessment score" of risk of musculoskeletal injury.

6/ History of officially recorded veterinary events, for example lameness after a specific race.

KENTUCKY PRE-RACE EXAMINATION, COHEN, 1999

[Applied to 2,187 horses starting in 3,227 races, January 1996 to October 1997.

1/ Evaluation of the horse's general condition.

2/ Palpation of forelimbs, carpus to hoof.

3/ Previous race history.

4/ Results of previous prerace inspections.

5/ Standardized "summary assessment score" of risk of musculoskeletal injury.

6/ History of officially recorded veterinary events, for example lameness after a specific race.

KENTUCKY PRE-RACE EXAMINATION, COHEN, 1999

[January 1996 to October 1997]

Review of the actual FMI rates in horses judged at increased risk of suffering musculoskeletal injury based on the results of the prerace examination showed that **5 horses in the control group suffered an FMI, compared with 6 horses in the test group.** These data do not support suggestions that horses identified at increased risk of injury during prerace examinations are at an increased risk of fatal musculoskeletal injury.

TABLE #1A: FATAL MUSCULOSKELETAL INJURIES, DIRT AND TURF STARTS, 2003-2004, & 2009-2010 PHENYLBUTAZONE THRESHOLD 2 MCG/ML

Surface\Year	2003	2004	2009	2010	03-10	MI/1000
Dirt/ Starts	757	1,100	802	181	2,840	
Dirt FMIs	0	1	1	1	3	1.06
Turf Starts	2,048	1,774	2,530	1,624	7,976	
Turf FMIs	3	1	4	5	14	1.75
Total Starts	2,805	2,874	3,332	1,805	10,816	
Total FMIs	3	2	5	6	17	1.57

TABLE #1B: FATAL MUSCULOSKELETAL INJURIES, DIRT AND TURF STARTS, 2005-2008, PHENYLBUTAZONE THRESHOLD 5 MCG/ML

Surface\Year	2005	2006	2007	2008	05-08	MI/1000
Dirt/ Starts	808	615	486	500	2,409	
Dirt FMIs	1	0	2	2	5	2.07
Turf Starts	2,231	2,504	2,756	2,648	10,139	
Turf FMIs	1	4	5	5	15	1.48
Total Starts	3,039	3,119	3,242	3,148	12,715	
Total FMIs	2	4	7	7	20	1.60

TABLE# 1C: RESULTS FOR TESTING THE HYPOTHESIS "NO DIFFERENCE BETWEEN THE TWO PHENYLBUTAZONE PROTOCOLS"

STATISTICAL PROCEDURE	RESULT	P-VALUE
1) Classical ANOVA	No significant difference	0.9294
2) Non parametric Analyses		
Wilcoxon	No significant difference	0.8893
Kruskal-Wallis	No significant difference	0. 7728
Van der Waerden	No significant difference	0.6896
Savage	No significant difference	0.6812
3) Fisher's exact test FMI rate and the protocols	No association between	> 0.5285

Conclusion: None of the above procedures indicates any statistically significant difference between the two phenylbutazone protocols.

adopting RMTC's policies.

The rules do not differentiate between 2 year olds and older horses because there w so. The levels of the NSAID's permitted on race day are arguably well below a clinically a fact, in California where the 5 ug/ml in plasma level has been in place for nearly 20 years, horses test below the 2 ug/ml level. The 5 ug/ml level simply provides a safety margin to a positives.

Furthermore, only one of three NSAID's is permitted which prevents the stacking NSAID's. Anecdotal information suggesting a synergistic analgesic effect of multiple NS issue. A recent study from University of Missouri (AJVR 67:398-402 2006) demonstrated to be associated with gastric lesions supporting the RMTC position. The same study found alone cause did not cause gastric lesions in their study. We found the same in a much larg Santa Anita and Hollywood Park (ProcAAEP 40:125-126 1994; EVJ Suppl:29:34-39 199 phenylbutazone was not associated with gastric ulcers in our race horse population.

I urge you to adopt the RMTC uniform medication guidelines as written. The RM protect the health and welfare of the horse and protect the integrity of racing. As a neighb uniform policy between Oregon and California only makes sense.

Respectfully,

KENTUCKY PRE-RACE EXAMINATION, COHEN, 1999

[January 1996 to October 1997]

Use of the:

1/ Summary assessment score for increased risk

2/ Number of suspensory ligament problems detected during prerace physical inspection would not be sufficient as a sole criterion to exclude a horse from racing in an attempt to prevent injury.

3/ Only 1.6% [1 in 62] of identified high-risk starts went on to yield a racing injury.

adopting RMTC's policies.

The rules do not differentiate between 2 year olds and older horses because there w so. The levels of the NSAID's permitted on race day are arguably well below a clinically a fact, in California where the 5 ug/ml in plasma level has been in place for nearly 20 years, horses test below the 2 ug/ml level. The 5 ug/ml level simply provides a safety margin to a positives.

Furthermore, only one of three NSAID's is permitted which prevents the stacking NSAID's. Anecdotal information suggesting a synergistic analgesic effect of multiple NS issue. A recent study from University of Missouri (AJVR 67:398-402 2006) demonstrated to be associated with gastric lesions supporting the RMTC position. The same study found alone cause did not cause gastric lesions in their study. We found the same in a much larg Santa Anita and Hollywood Park (ProcAAEP 40:125-126 1994; EVJ Suppl:29:34-39 199 phenylbutazone was not associated with gastric ulcers in our race horse population.

I urge you to adopt the RMTC uniform medication guidelines as written. The RM protect the health and welfare of the horse and protect the integrity of racing. As a neighb uniform policy between Oregon and California only makes sense.

Respectfully,

lifornia where the 5 ug/ml in plasma level has been in place for nearly 20 years, the vast majority o
below the 2 ug/ml level. The 5 ug/ml level simply provides a safety margin to avoid inadvertent

urthermore, only one of three NSAID's is permitted which prevents the stacking effect of multiple
Anecdotal information suggesting a synergistic analgesic effect of multiple NSAID's is only one
ecent study from University of Missouri (AJVR 67:398-402 2006) demonstrated multiple NSAID's
ciated with gastric lesions supporting the RMTC position. The same study found phenylbutazone
se did not cause gastric lesions in their study. We found the same in a much larger clinical study at
ta and Hollywood Park (ProcAAEP 40:125-126 1994; EVJ Suppl:29:34-39 1999) , specifically
azone was not associated with gastric ulcers in our race horse population.

rge you to adopt the RMTC uniform medication guidelines as written. The RMTC guidelines
e health and welfare of the horse and protect the integrity of racing. As a neighboring state, a
olicy between Oregon and California only makes sense.

lly,

Arthur, DVM

Medical Director

KENTUCKY PRE-RACE EXAMINATION, COHEN, 1999

[January 1996 to October 1997]

As such, Cohen et al considered that excluding all horses judged to be at increased risk of injury on the basis of the pre-race physical examination would be

Unreasonable, because the pre-race inspection summary assessment score lacked the required specificity to form the basis for excluding a horse from racing.

Dr. George Mundy, 1997

FACTORS **ASSOCIATED** WITH VARYING FMI RATES

1/ Age, 2/ Sex, 3/ Class/Caliber of Race, 4/ Jockey, 5/ Racing Surface, 6/ Surface Condition, 7/ Exercise Intensity, 8/ Pre-Existing Conditions, 9/ Horseshoe Characteristics, 10/ Summary Risk Assessment, 11/ Barrier Position, 12/ Age at First Race, 13/ Racing Frequency,14/ Duration of Racing Career, 15/ Number of Starts per Year, 16/ Intensity of Racing and Training Schedules, 17/ Weather, 18/ Season, 19/ Pre-existing Osseous Lesions, 20/ Experience of the Trainer, 21/ Class of Race, 22/ Stumbling/Physical Interactions among Horses during Race, 23/ Racetracks, 24/ Results of Pre-Race Physical Inspections, 25/ “Ship-in” Status.