Exercise History Report (Full)
Horse #4

UCDAVIS
VETERINARY MEDICINE
J. D. Wheat Veterinary Orthopedic Research Laboratory

Oct-03-2013

Exercise History Report (Full)

J.D. Wheat Veterinary Orthopedic Research Laboratory

This report summarizes the high speed exercise history for Case Horse. There are four parts to this report:

Part 1 is a graph that depicts the races and officially recorded high speed workouts for Case Horse over the horse's career. The graph is useful for visually assessing features of a horse's career like: career length, periods of layup, and exercise consistency. If Case Horse had zero recorded high-speed exercise events, this graph is not produced. Event histories for three breed, sex, age, and event-matched control horses are also plotted.

Part 2 includes graphs which illustrate Case Horse's exercise history alongside that of Control Horses. These graphs are useful for visually comparing periods of layup and specific rates of exercise in the horses' exercise histories.

Part 3 is a chronological listing of races and officially timed works beginning with the most recent event (race or work).

Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed in the context of a normal range for 95% of a sample of similar racehorses that did not die during the same time as Case Horse.

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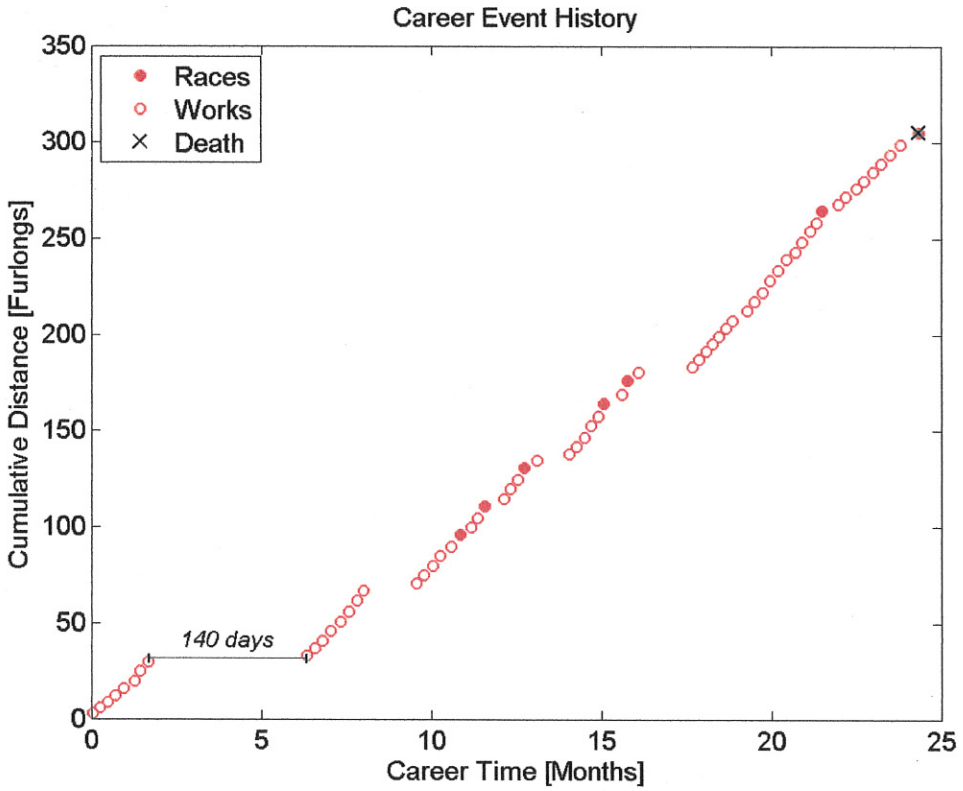
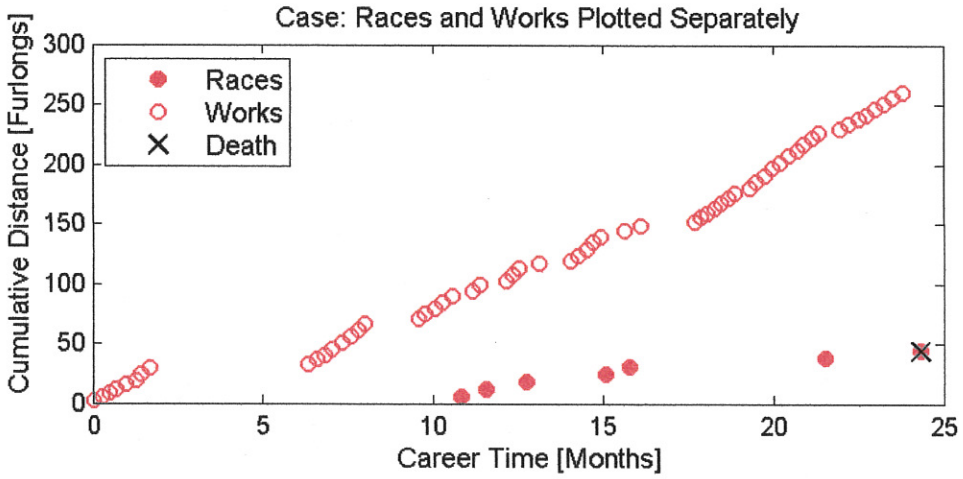
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

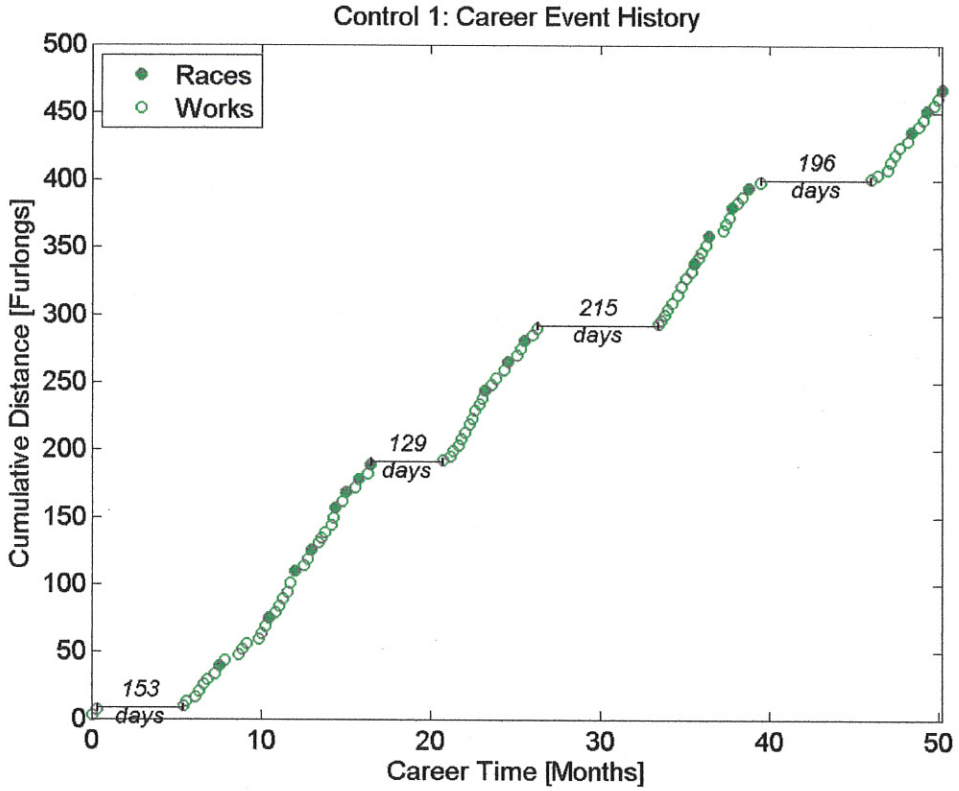
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs the horse exercised in that event is added to the number of furlongs exercised in all previous events.

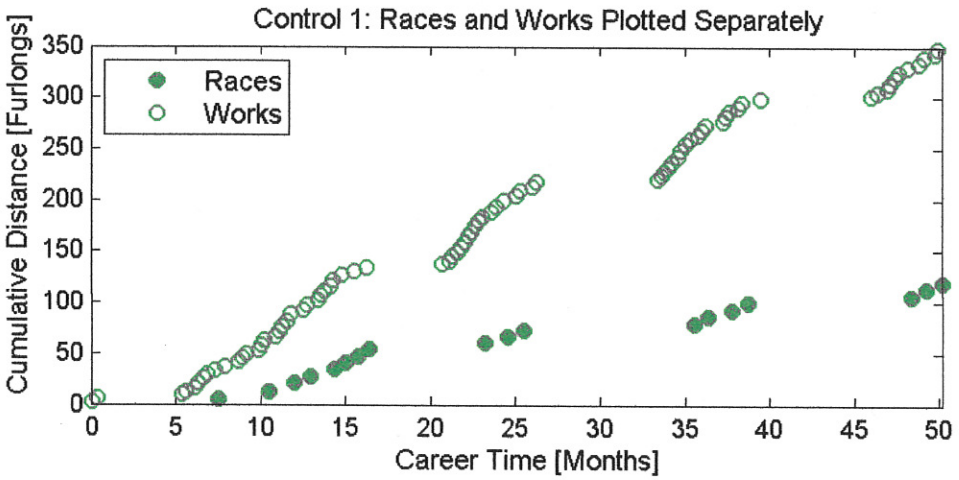
Case Horse High Speed Exercise History



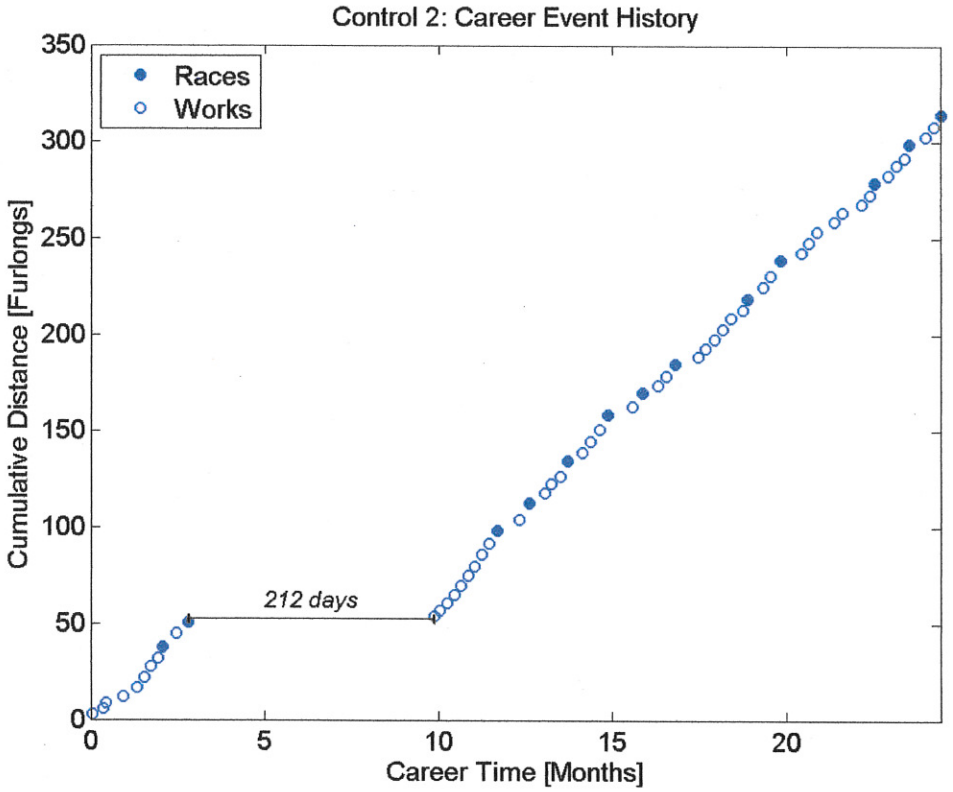


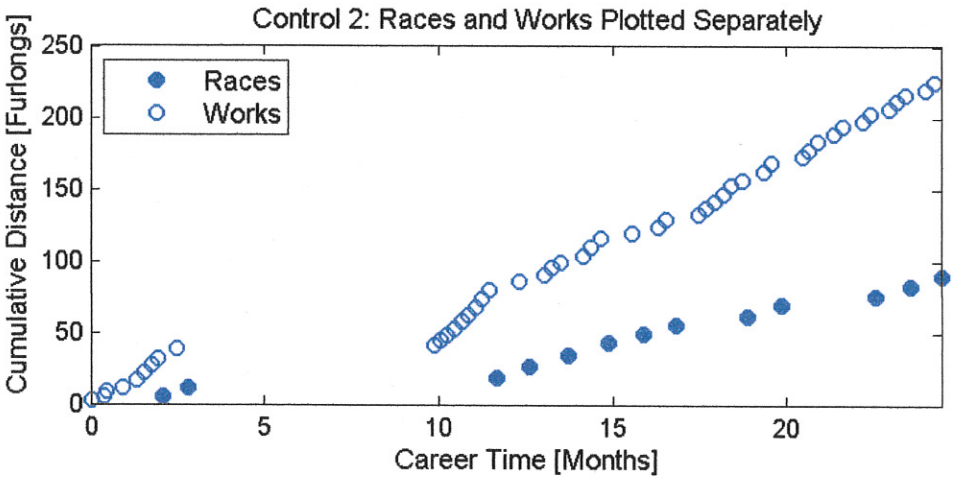
Control 1 High Speed Exercise History



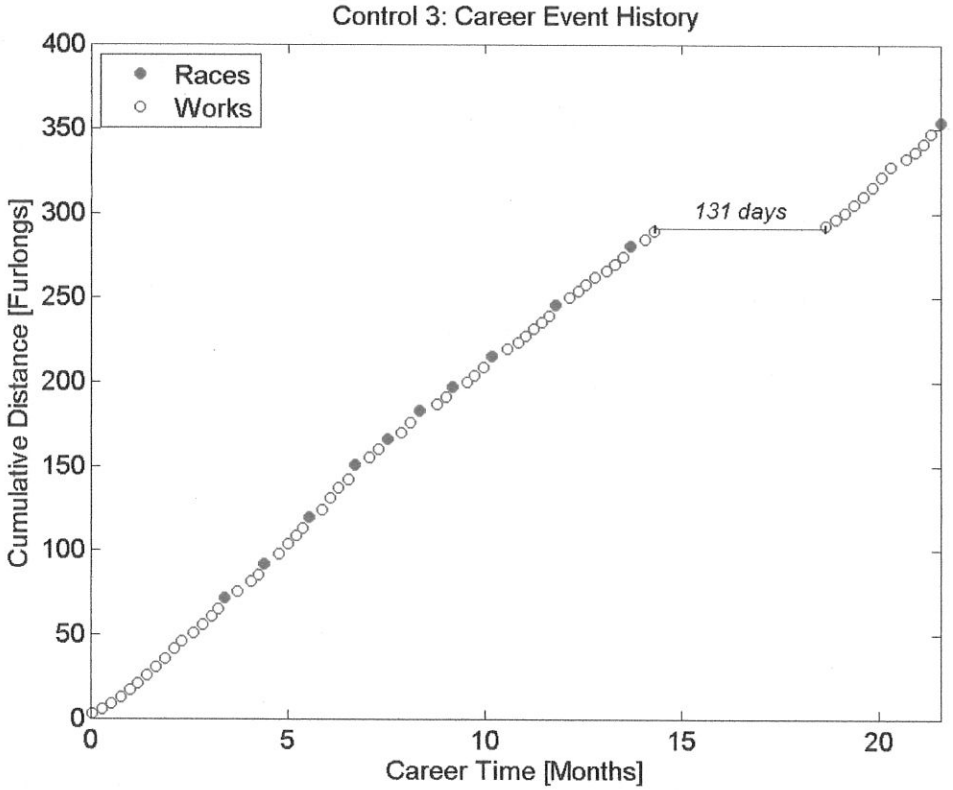


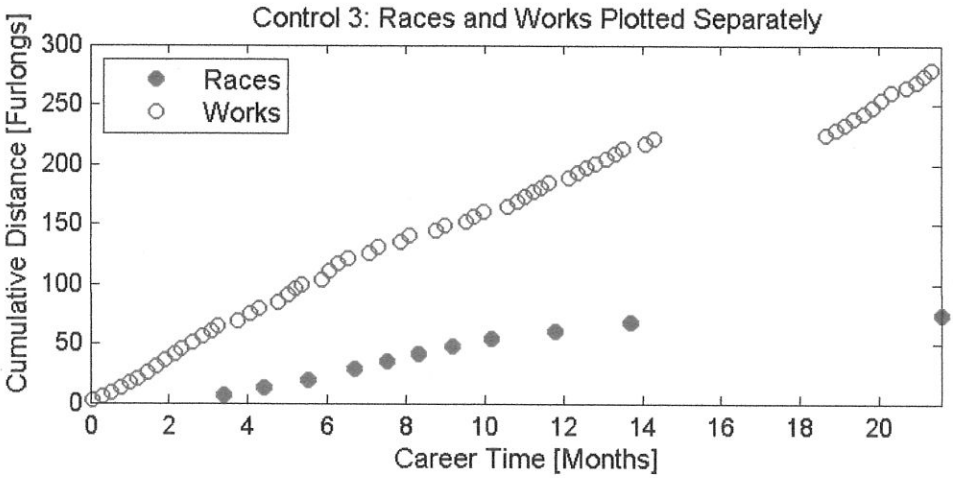
Control 2 High Speed Exercise History



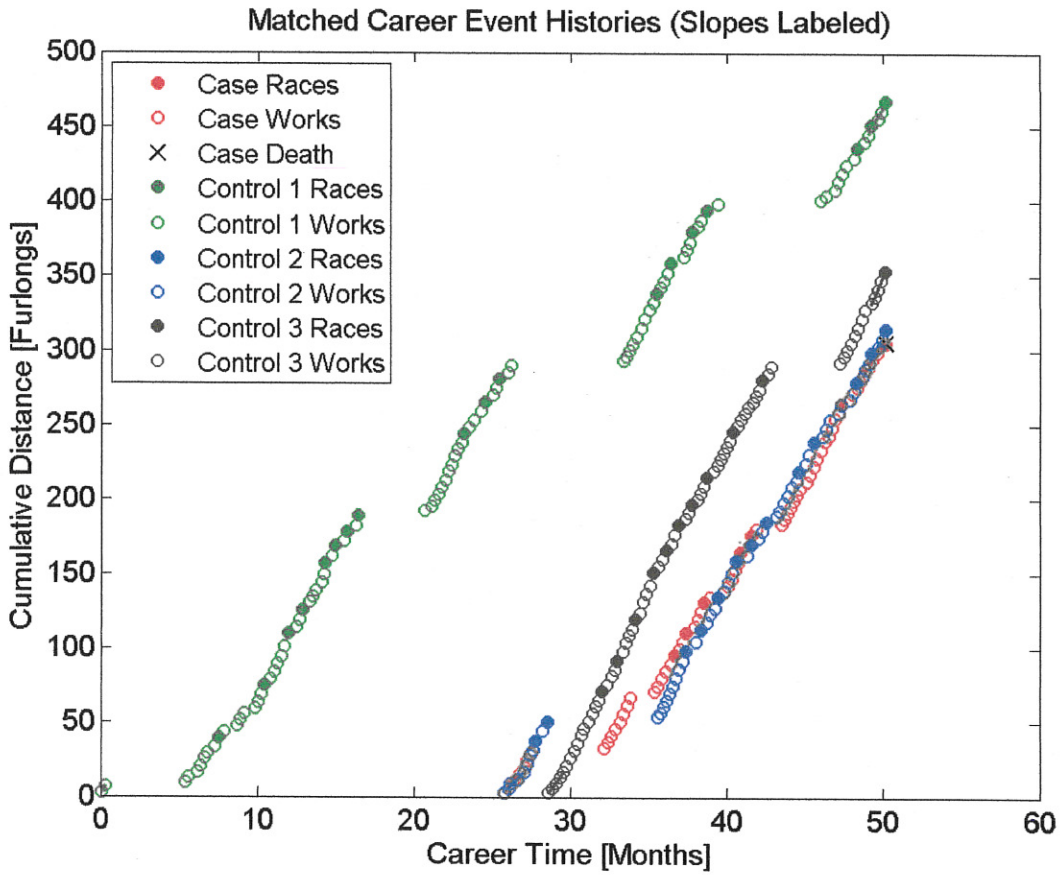


Control 3 High Speed Exercise History

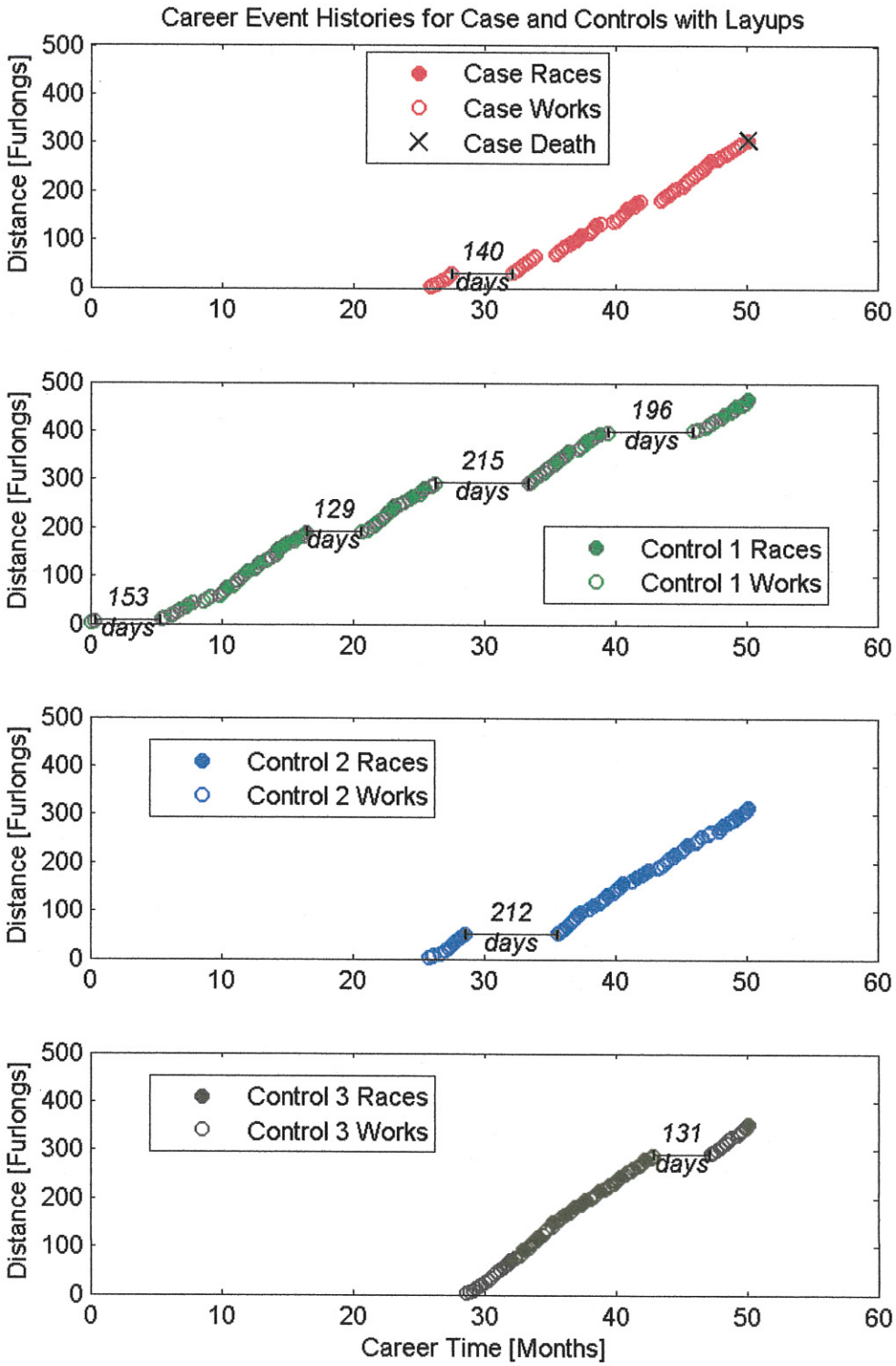


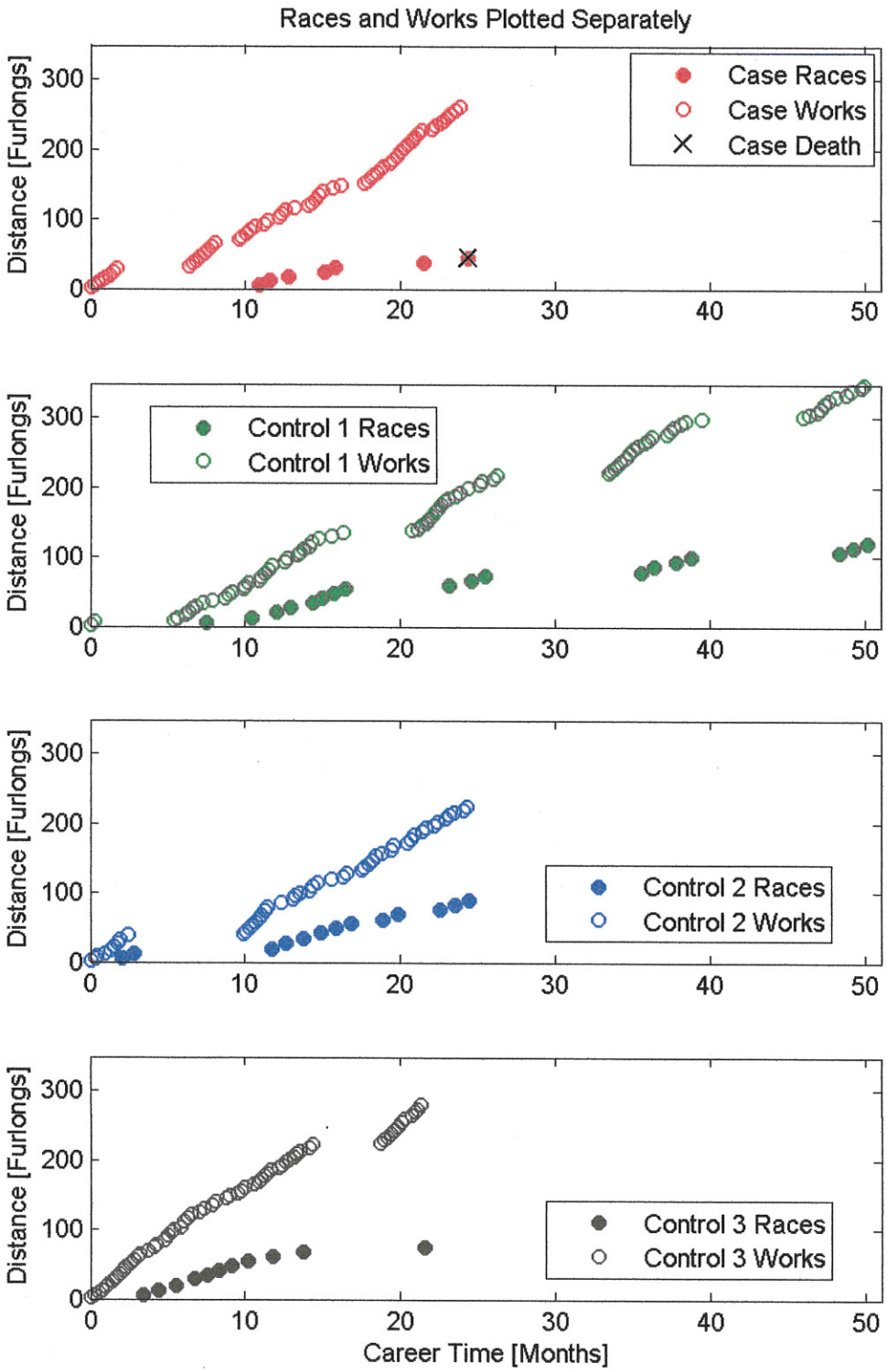


Part 2: Case and Control Horses Plotted Together



Case and Control Horses' exercise event histories are plotted on the same axes. The plots are aligned by the match date (equal to the date of death of Case Horse). Lines segments indicate specific rates of exercise at the start of career, end of career (for Case Horse), and match date (for Control Horses). Event rates are calculated as the slopes of the plots over 2 to 5 events not spanning a layup period, in units of furlongs per month.


Career Event Histories for Case and Controls with Layups
Distance [Furlongs]
Case Races
Case Works
Case Death
140
days
Control 1 Races
Control 1 Works
153
days
129
days
215
days
196
days
Control 2 Races
Control 2 Works
212
days
Control 3 Races
Control 3 Works
131
days
Career Time [Months]


Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

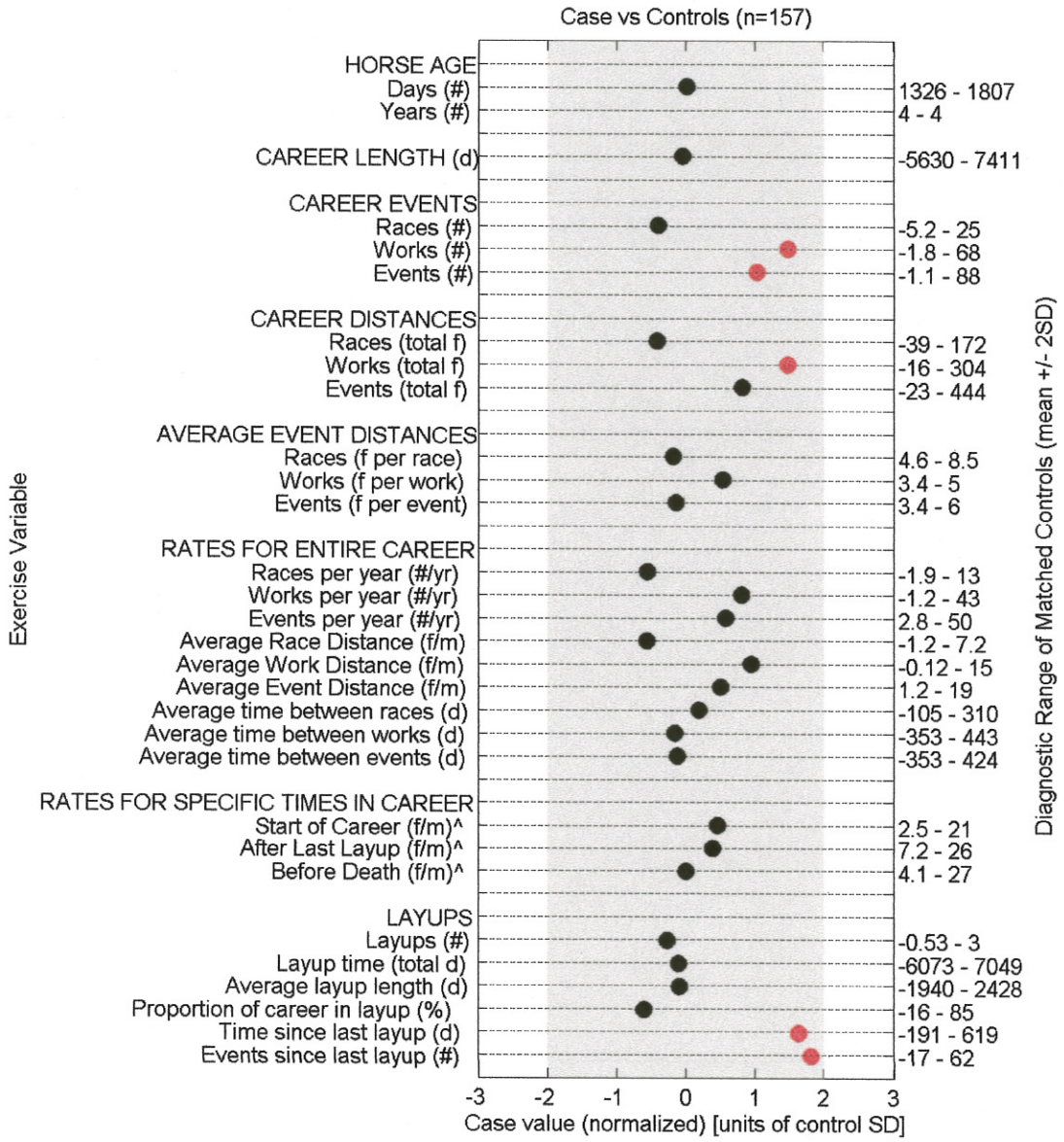
Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
6/15/2012	R	6.5	BHP	AllWthr	Fast		3U	Aoc62500nw2$/ x-N	350	6
5/30/2012	W	5.0	BHP	AllWthr	Fast	:59.80				
5/21/2012	W	5.0	BHP	AllWthr	Fast	01:00.2				
5/13/2012	W	4.0	BHP	AllWthr	Fast	:47.00				
5/6/2012	W	5.0	BHP	AllWthr	Fast	01:01.6				
4/28/2012	W	4.0	BHP	AllWthr	Fast	:47.20				
4/21/2012	W	4.0	HOL	AllWthr	Fast	:49.40				
4/12/2012	W	4.0	HOL	AllWthr	Fast	:47.20				
4/5/2012	W	3.0	HOL	AllWthr	Fast	:37.80				
3/22/2012	R	6.5	SA	Dirt	Fast		4U	Alw60000nw2$/ x	1200	5
3/17/2012	W	4.0	HOL	AllWthr	Fast	:48.80				
3/11/2012	W	6.0	HOL	AllWthr	Fast	01:12.4				
3/4/2012	W	5.0	HOL	AllWthr	Fast	:59.40				
2/27/2012	W	4.0	HOL	AllWthr	Fast	:48.20				
2/19/2012	W	6.0	HOL	AllWthr	Fast	01:13.6				
2/12/2012	W	5.0	HOL	AllWthr	Fast	:59.60				
2/5/2012	W	6.0	HOL	AllWthr	Fast	01:11.2				
1/29/2012	W	5.0	HOL	AllWthr	Fast	:59.20				
1/22/2012	W	5.0	HOL	AllWthr	Fast	01:00.0				
1/16/2012	W	5.0	HOL	AllWthr	Fast	01:00.0				
1/3/2012	W	4.0	SA	Dirt	Fast	:48.20				
12/28/2011	W	4.0	SA	Dirt	Fast	:49.40				
12/22/2011	W	4.0	SA	Dirt	Fast	:49.40				
12/16/2011	W	4.0	SA	Dirt	Fast	:49.40				
12/10/2011	W	4.0	SA	Dirt	Fast	:49.20				
12/4/2011	W	4.0	SA	Dirt	Fast	:50.40				
11/28/2011	W	3.0	SA	Dirt	Fast	:36.40				
10/12/2011	W	4.0	SA	Dirt	Fast	:47.40				
10/2/2011	R	7.0	SA	Dirt	Fast		3U	Aoc62500nw2$/ x-N	1020	5

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
9/27/2011	W	5.0	SA	Dirt	Fast	:59.80				
9/11/2011	R	6.5	FPX	Dirt	Fast		3	JKostoff -50k	9500	2
9/6/2011	W	5.0	SA	Dirt	Fast	:59.20				
8/31/2011	W	6.0	SA	Dirt	Fast	01:12.8				
8/25/2011	W	5.0	SA	Dirt	Fast	01:00.0				
8/18/2011	W	4.0	SA	Dirt	Fast	:48.40				
8/11/2011	W	3.0	SA	Dirt	Fast	:36.60				
7/14/2011	W	4.0	BEL	Dirt	Fast	:49.18				
7/3/2011	R	6.0	MTH	Dirt	Muddy		3	JerShrG3 -150k	30000	2
6/27/2011	W	5.0	BEL	Dirt	Fast	01:00.2				
6/21/2011	W	5.0	BEL	Dirt	Fast	01:00.1				
6/15/2011	W	4.0	BEL	Dirt	Fast	:49.23				
5/29/2011	R	6.0	CD	Dirt	Fast		3	Aoc75000nw1/ x-N	30600	1
5/23/2011	W	5.0	CD	Dirt	Muddy	01:00.0				
5/17/2011	W	4.0	CD	Dirt	Fast	:48.80				
5/7/2011	R	6.0	CD	Dirt	Fast		3U	Msw	29400	1
4/29/2011	W	5.0	CD	Dirt	Fast	01:00.8				
4/20/2011	W	5.0	SA	Dirt	Fast	01:00.0				
4/13/2011	W	5.0	SA	Dirt	Fast	:59.00				
4/5/2011	W	4.0	SA	Dirt	Fast	:47.40				
3/30/2011	W	4.0	SA	Dirt	Fast	:47.20				
2/11/2011	W	5.0	HOL	AllWthr	Fast	:59.00				
2/5/2011	W	6.0	HOL	AllWthr	Fast	01:10.8				
1/29/2011	W	5.0	HOL	AllWthr	Fast	:59.00				
1/22/2011	W	5.0	HOL	AllWthr	Fast	:59.20				
1/13/2011	W	5.0	HOL	AllWthr	Fast	:59.80				
1/6/2011	W	4.0	HOL	AllWthr	Fast	:48.00				
12/30/2010	W	4.0	HOL	AllWthr	Fast	:48.60				
12/23/2010	W	3.0	HOL	AllWthr	Fast	:36.60				
8/5/2010	W	5.0	DMR	AllWthr	Fast	01:00.0				
7/29/2010	W	5.0	DMR	AllWthr	Fast	01:00.6				
7/24/2010	W	4.0	DMR	AllWthr	Fast	:48.40				

Date	Race/ Work	Fur- longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn- ings	Finish
7/15/2010	W	4.0	SA	AllWthr	Fast	:47.80				
7/7/2010	W	3.0	SA	AllWthr	Fast	:36.40				
7/1/2010	W	3.0	SA	AllWthr	Fast	:36.40				
6/24/2010	W	3.0	HOL	AllWthr	Fast	:36.20				
6/17/2010	W	3.0	HOL	AllWthr	Fast	:37.00				

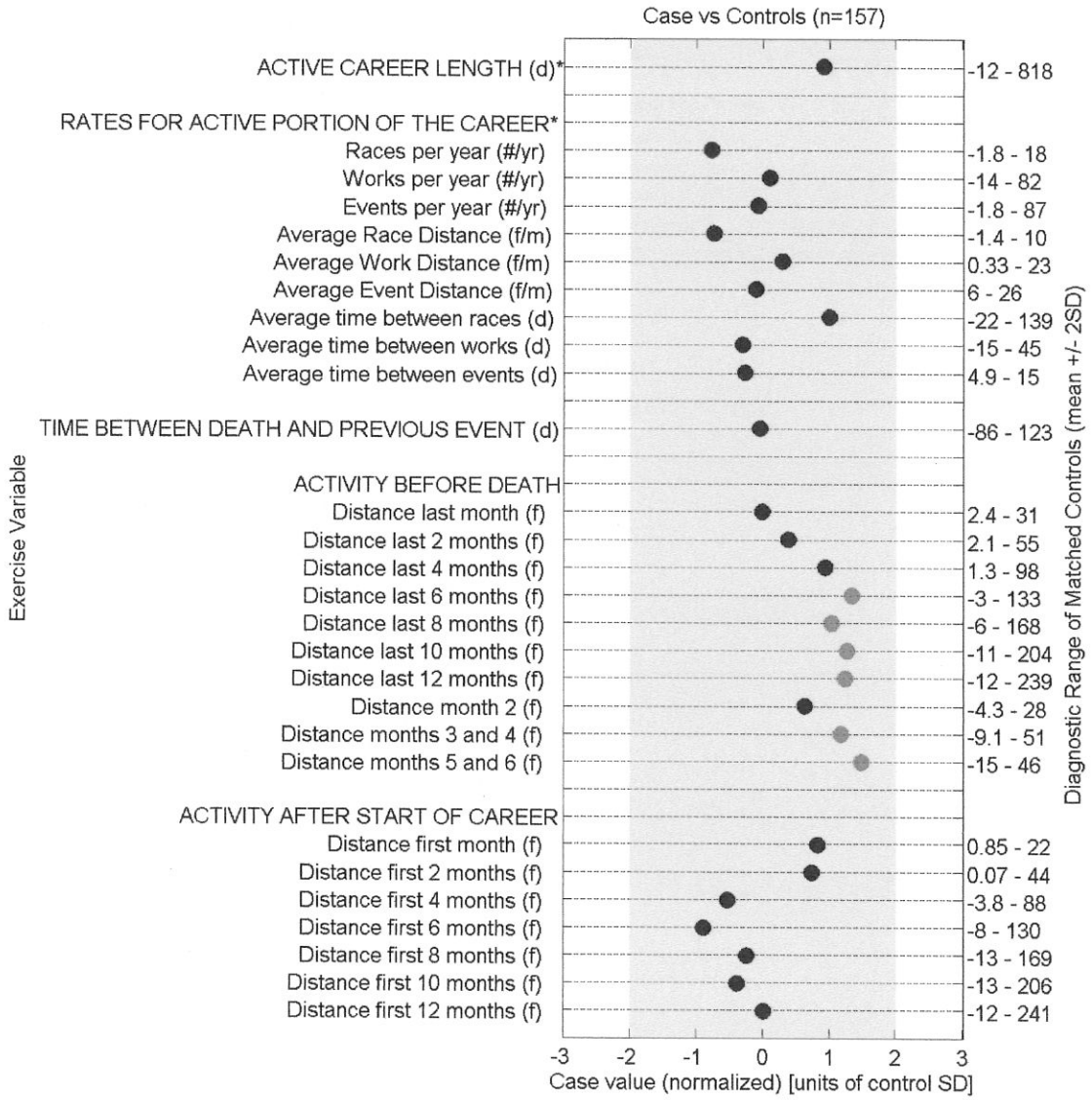
Part 4: Comparison of Exercise Variables between Case Horse and 157 Control Horses (4 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, male, Thoroughbreds (n=157) (gray region) (black and red indicate within 1 and 2 SD, respectively, of mean value of controls), X's indicate values outside of the normal range. Two and 3 year old case horses are also matched to control horses by the quarter in which the case horse died (Jan-Mar, Apr-Jun, Jul-Sep,Oct-Dec). Variables that are not calculable are not plotted (e.g. time between races for a horse with zero events). f=furlongs; yr=year; m=month; d=days.

^Rates are calculated over 2 to 5 events.

*Active Career Length is the career length excluding the time during layups.



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, male, Thoroughbreds (n=157) (gray region) (black and red indicate within 1 and 2 SD, respectively, of mean value of controls), X's indicate values outside of the normal range. Two and 3 year old case horses are also matched to control horses by the quarter in which the case horse died (Jan-Mar, Apr-Jun, Jul-Sep,Oct-Dec). Variables that are not calculable are not plotted (e.g. time between races for a horse with zero events). f=furlongs; yr=year; m=month; d=days.

^Rates are calculated over 2 to 5 events.

*Active Career Length is the career length excluding the time during layups.

California Animal Health & Food Safety Laboratory System
105 W. Central Avenue
San Bernardino, CA 92408-2113
(909) 383-4287

Final
Version 1
This report supersedes all previous reports for this case

CAHFS Case #:Horse #4
Referral #: [redacted]
Date Collected: 06/15/2012
Date Received: 06/16/2012
Case Coordinator: Santiago Diab, DVM
Electronically Signed and Authorized By: Diab, Santiago S on 7/12/2012 3:52:44PM

Email To:
ARTHUR, RICK M
RMARTHUR@UCDAVIS.EDU

Incident Track:
HOLLYWOOD PARK RACETRACK
1050 S PRAIRIE AVE
Inglewood, CA 90301

Comments: CHRB

Case Contacts

Bill To	CALIFORNIA HORSE RACING BOARD	916-263-6000	1010 HURLEY WAY SUITE 300ATTENTION: ACCOUNTS PAYABLE SACRAMENTO, CA 95825
Owner	[redacted]	[redacted]	[redacted]
Report To	UZAL, FRANCISCO	909-383-4287	CAHFSL105 WEST CENTRAL SAN BERNARDINO, CA 92408
Report To	ARTHUR, RICK M	626-665-8130	311 E GRAND VIEW AVE SIERRA MADRE, CA 91024
Attending Vet	STEAD, DANA	970-310-4449	1050 S PRAIRIEHOLLYWOOD PARK Inglewood, CA 90301
Submitter	BAILEY, JILL	310-419-1680	1050 S. PRAIRIE AVE INGLEWOOD, CA 90301
Trainer	BAFFERT, BOB	714-969-2377	6122 EAGLECREST DRIVE Huntington Beach, CA 92648

CHRB - Related Information

Horse's Name:	[redacted]	Human Injury?	N
Tattoo:		Death Related to:	Race
Age:	4.00 Years	Track Surface:	Synthetic
Gender:	Male	Location on Track:	Past Wire
Taxonomy:	Thoroughbred Horse	Insured?	N

Medications: Butazolidin (Phenylbutazone); Lasix (Furosemide);

Laboratory Findings/Diagnosis

Thoroughbred colt submitted with a history of post-race collapse.

1. Cardiovascular collapse (heart failure), etiology undetermined to this date, with:
- Myocardial degeneration, peracute, multifocal and locally extensive, moderate, left and right atrium, right ventricular free wall.
- Myocardial necrosis, focally moderate, subacute, left ventricle (pulmonary artery/semilunar valve region).
- Valvular endocarditis, mild, subacute/chronic, lymphocytic and neutrophilic, multifocal, left atrioventricular valve.
- Pulmonary edema, moderate with, diffuse, marked congestion and mild to moderate, multifocal, intraalveolar acute hemorrhage.
- Petechial and ecchymotic hemorrhages, moderate to marked, serosas of the thoracic cavity.
- Hepatic congestion, marked, panlobular, diffuse, with separation of the hepatic cords.
- Jejunal congestion, locally extensive, moderate to marked, with multifocal, mild to moderate, mucosal, acute hemorrhages.
- Renal congestion, glomerular and interstitial, cortical and medullary, diffuse, marked.

2. CAHFS Davis toxicology results
- Liquid chromatography - mass spectroscopic organic chemical screening did not identify any compounds of toxicological significance; liver.
- Gas chromatography - mass spectrometry organic chemical screening did not identify any compounds of toxicological

significance; liver.
- Alkaloid screen - No alkaloids detected; colon content.
- Ionophore screen - No ionophores detected; colon content.
- Oleander testing - No Oleander glycosides detected; stomach and colon contents.

3. EACL laboratory - UC Davis toxicology results
- Urine: Nandrolone, Methocarbamol, Diclofenac, Flunixin, Phenylbutazone, and Furosemide detected.
- Synovial fluid: Diclofenac and Phenylbutazone detected.
- Liver: Phenylbutazone (trace) and Clenbuterol (trace) detected.

4. Other miscellaneous incidental pathology findings:
- Encephalitis, perivascular, lymphocytic, focal and very mild.
- Gastric ulcers, neutrophilic, multifocal, moderate, chronic, non-glandular mucosa.

Case Summary

6/18/2012: Although the gross findings are non-diagnostic and also non-specific, along with the clinical history, they suggest a cardiovascular collapse. However, I will rely on the histological examination of the tissues and toxicology to try to determine the cause of death in this horse. Stomach and intestinal contents (small intestine, colon, cecum), liver, kidney, brain, joint fluid, hair and urine (150 cc) have been collected. Liver has been submitted for toxicology (heavy metal screen and GC/MS screen) and urine will be sent to the Equine Analytical Laboratory (Dr. Stanley). The rest of the samples will be stored in San Bernardino for further use if requested. More laboratory results to follow.

6/22/2012: I apologize but due to technical problems with our computer software the comments made on the second preliminary report were not included in your copy. Therefore, in this third preliminary report, I only add the following general comments about the findings previously reported in preliminary report #2.

Based on the history and histopathology findings a diagnosis of cardiovascular collapse is made. Very acute and moderately extensive myocardial degeneration was observed in the right and left atrium, and right ventricle free wall. Although the etiology is unknown, cardiotoxins or hypoxia/ischemia are the main differential diagnoses. In addition, there was a focal, more chronically affected area in the left ventricle (semilunar valve region) with loss of cardiomyocytes, neovascularization and early fibroplasia. As with the more acute heart lesion, the etiology of this focally chronic heart lesion is undetermined, but two possibilities are sublethal toxic or hypoxic damage. There was a mild pleocellular valvular endocarditis of the left atrioventricular valve. Since we have implemented the cardiac protocol in cases of equine sudden death, which includes examination of the valves, we have detected this type of mild valvular endocarditis in a few cases. However, the clinical significance of this finding is not clear and it may possibly be an incidental, non-specific lesion. In addition, pulmonary congestion, hemorrhage and edema, marked hepatic passive congestion, marked small intestine and renal congestion, and acute hemorrhages in the thoracic serosas support the diagnosis of cardiovascular collapse. Histology of the brain showed very mild, focal, perivascular non-suppurative encephalitis which is most likely an incidental finding. In addition to urine samples, synovial fluid and liver were submitted to the Equine Analytical laboratory (Dr. Stanley) at UC Davis. Liquid chromatograph/mass spectroscopic screening was unremarkable. More toxicology to follow.

07/2/2012: All toxicological tests performed at CAHFS have been negative. Toxicological results from the Equine Analytical Laboratory (EAL) at UC Davis are still pending and I will re-open the case to report these results when available to us. The samples submitted to the EAL include urine, synovial fluid and liver. This concludes all testing in this case.

07/12/2012: Toxicology results from the EACL at UC Davis are included in this report. This now completes all toxicological testing unless otherwise requested by submitter.

Clinical History

Collapsed postrace - died.
4th horse to collapse/die for this trainer in less than one year.
Been training BHP - drilling
No meds post race.

Gross Observations

Necropsy of a [redacted] Thoroughbred horse [redacted]

[redacted] began at 11:00 a.m. on June 16th, 2012. The carcass was well fleshed, had adequate fat deposits and the tissues were in a good state of postmortem preservation.

Along the adventitia of the thoracic segment of the aorta and adjacent parietal pleura, the mediastinum at the thoracic inlet, and pericardium at the base of the heart and along the coronary grooves there were moderate to marked petechiae and ecchymoses. Within the trachea and major airways, there was moderate amount of pink, stable foam (edema). The non-glandular mucosa of the stomach had several, multifocal, variably shaped, small to mid-size (up to 2 cm diameter), chronic mucosal ulcers with raised margins. The spleen and liver appeared slightly small.

Histology

Sections of the heart (11), lungs, liver, spleen, kidneys, pancreas, gastrointestinal tract, skeletal muscle, adrenal gland, frenic nerve, aorta and surrounding soft tissues and brain were examined and findings are summarized.

Coded histological slides/cassettes: 1. Right ventricular free wall; 2. Pulmonary artery semilunar valve; 3. Right atrial appendage; 4. Sinoatrial node region; 5. Left atrial appendage; 6. Left atrioventricular valve; 7. Left ventricular papillary muscle; 8. Section of second papillary muscle; 9. Atrioventricular node region; 10. IV septum; 11. Aortic semilunar valve.

- Myocardial degeneration, peracute, multifocal and locally extensive, moderate, left and right atrium, right ventricular free wall (# 1, 3, and 5).
- Myocardial necrosis, focally moderate, subacute, left ventricle (# 2).
- Valvular endocarditis, mild, subacute/chronic, lymphocytic and neutrophilic, multifocal, left atrioventricular valve (# 6).
- Pulmonary congestion, diffuse, marked, with mild to moderate, multifocal, intraalveolar acute hemorrhage and edema.
- Hepatic congestion, marked, panlobular, diffuse, with separation of the hepatic cords.
- Encephalitis, perivascular, lymphocytic, focal and very mild.
- Jejunal congestion, locally extensive, moderate to marked, with multifocal, mild to moderate, mucosal, acute hemorrhages.
- Aorta, adventitial and periarterial hemorrhages, acute, moderate.
- Gastric ulcers, neutrophilic, multifocal, moderate, chronic, non-glandular mucosa.
- Renal congestion, glomerular and interstitial, cortical and medullary, diffuse, marked.

Stained Slides - Billed

Animal/Source	Specimen	Specimen Type	Results
[redacted]	block #5	Tissue Block	4.00

Toxicology

Reporting Limit (Rep. Limit): The lowest routinely quantified concentration of an analyte in a sample. The analyte may be detected, but not quantified, at concentrations below the reporting limit. Sample volumes less than requested might result in reporting limits that are higher than those listed.

The detected liver mineral results are within acceptable or non-diagnostic ranges for this species.
None of the alkaloids included in our screen were detected in the colon contents, at or above the indicated reporting limit.
Oleandrin was not detected in the submitted specimen, at or above the indicated reporting limit.
None of the ionophores included in our screen were detected in the submitted sample, at or above the indicated reporting limit.
No toxic compounds were detected on the submitted specimen by our gas chromatography - mass spectrometry (GC/MS) and liquid chromatography - mass spectroscopy (LC/MS) organic chemical screen. These screens are designed to potentially detect a large number of organic compounds belonging to diverse chemical classes (pesticides, environmental contaminants, drugs and natural products). Control matrices were obtained to compare analytical results with those obtained from the submitted specimen. No unexpected chemicals were identified. Within the limits of the samples tested and the analytical procedures performed, chemical contamination of the submitted specimens appears unlikely.

ALKALOID SCREEN

Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Colon Contents

Analyte	Result	Units	Rep. Limit	Units

Anabasine	Not Detected	ppm	1.0	ppm
Atropine	Not Detected	ppm	1.0	ppm
Coniine	Not Detected	ppm	1.0	ppm
Deltaline	Not Detected	ppm	1.0	ppm
Nicotine	Not Detected	ppm	1.0	ppm
Scopolamine	Not Detected	ppm	1.0	ppm
Sparteine	Not Detected	ppm	1.0	ppm
Taxus	Not Detected	% plant	1.0	% plant

GCMS Screen

Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Liver Tissue

Analyte	Result	Units	Rep. Limit	Units
Negative	See comment under Toxicology	NA	NA	NA

HEAVY METAL SCREEN

Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Liver Tissue

Analyte	Result	Units	Rep. Limit	Units	Ref. Range
Lead	Not Detected	PPM	1.000	PPM	<3.0
Manganese	1.3	PPM	0.040	PPM	1-6
Iron	390	PPM	0.200	PPM	100-300
Mercury	Not Detected	PPM	1.000	PPM	<1.0
Arsenic	Not Detected	PPM	1.000	PPM	<1.0
Molybdenum	0.69	PPM	0.400	PPM	<2.0
Zinc	44	PPM	0.100	PPM	40-125
Copper	5.8	PPM	0.100	PPM	4-7.5
Cadmium	0.80	ppm	0.300	ppm	<20

IONOPHORE SCREEN

Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Colon Contents

Analyte	Result	Units	Rep. Limit	Units
Lasalocid	Not Detected	ppm	0.10	ppm

Monensin	Not Detected	ppm	0.10	ppm
Narasin	Not Detected	ppm	0.10	ppm
Salinomycin	Not Detected	ppm	0.10	ppm

LCMS Screen

Animal/Source	Specimen	Specimen Type
[redacted]	[redacted]	Liver Tissue

Analyte	Result	Units	Rep. Limit	Units
Negative	See comment under Toxicology	NA	NA	NA

OLEANDER GLYCOSIDES

Animal/Source	Specimen	Specimen Type	Results	Units	Rep. Limit
[redacted]	[redacted]	Stomach Contents	Not Detected	ppm	0.05
[redacted]	[redacted]	Colon Contents	Not Detected	ppm	0.05

SELENIUM - TISSUE/OTHER

Animal/Source	Specimen	Specimen Type	Results	Units	Rep. Limit	Ref. Range
[redacted]	[redacted]	Liver Tissue	0.61	ppm	0.020ppm	0.3-1.0

Appendix - Report Related Images

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July 12, 2012

Santiago Diab, DVM
CAHFS-San Bernardino
105 W. Central Ave.
San Bernardino, CA 92408

INVESTIGATION: Post-Mortem Testing (EQ0505 - S1205122)

Received:	June 20, 2012
Laboratory No.:	EACL-120620-2
Sample No.:	120620-198744
No. of Samples:	7

The urine, liver sample and synovial fluids were delivered on June 20, 2012 via Golden State Overnight.

The samples were all subjected to analysis for the presence of exogenous drug substances by Liquid Chromatography – Mass Spectrometry and Gas Chromatography – Mass Spectrometry.

The following were detected:

Urine:	Nandrolone, Methocarbamol, Diclofenac, Flunixin, Phenylbutazone, Furosemide
Synovial Fluid:	Diclofenac, Phenylbutazone
Liver:	trace Phenylbutazone, trace Clenbuterol

No further testing has been assigned. If you have any questions or require additional information, please don't hesitate to contact me.

The remainder of the original sample will be stored at the Maddy Lab and disposed of after 60 days.

Sincerely,

Scott D. Stanley, PhD
Professor
University of California – Davis