

Exercise History Report (Full)

Horse #7



UC DAVIS

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.

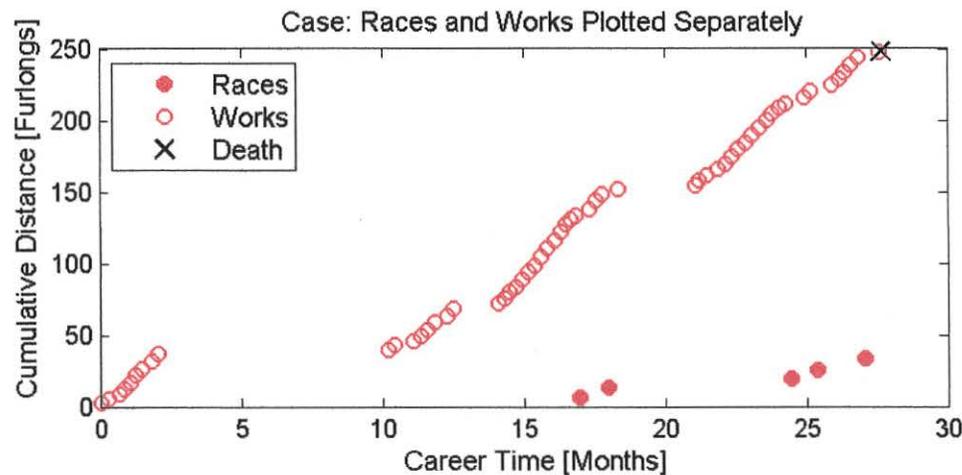
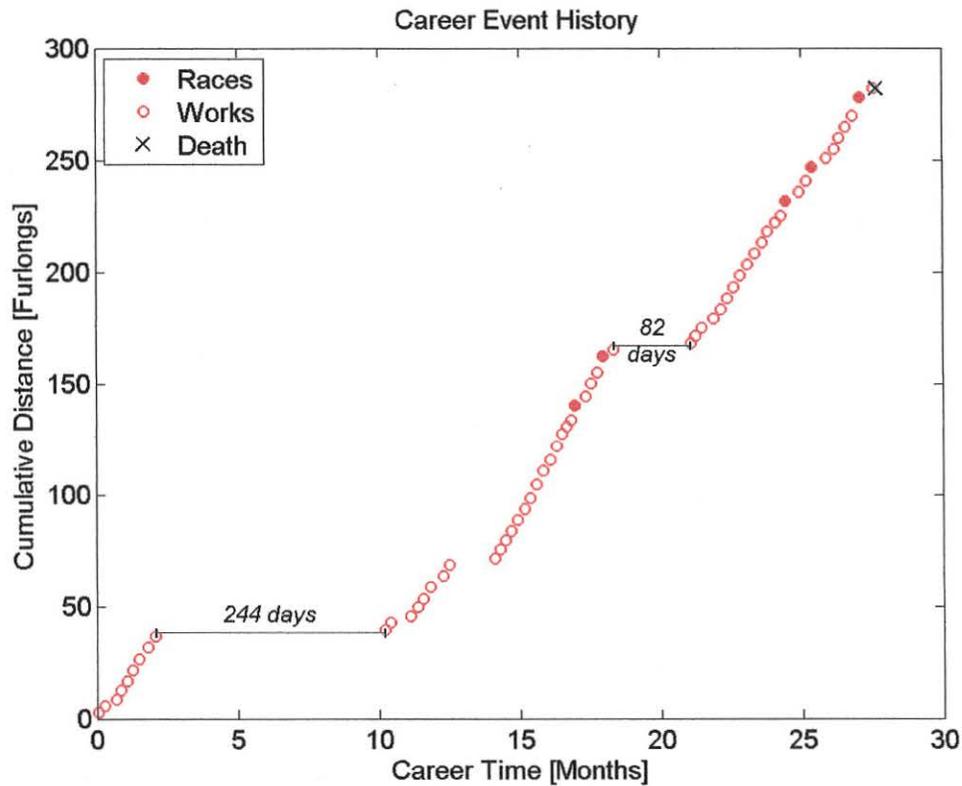
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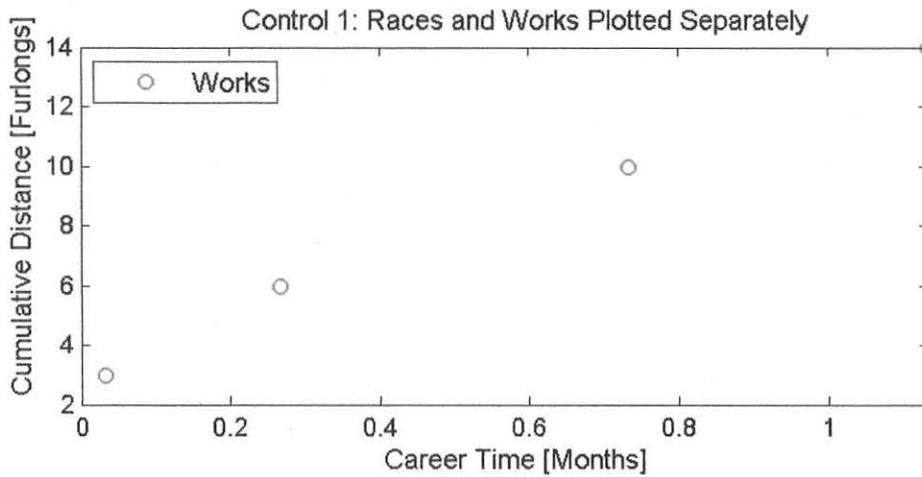
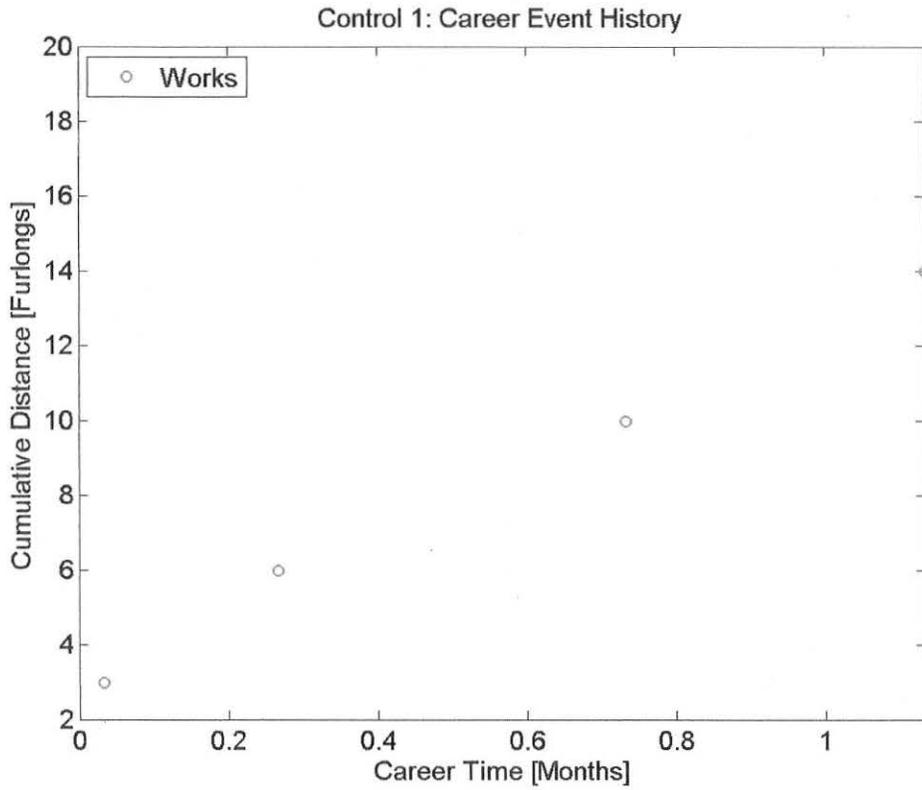
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

Races (filled circles), officially timed high-speed works (open circles), layoffs (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.

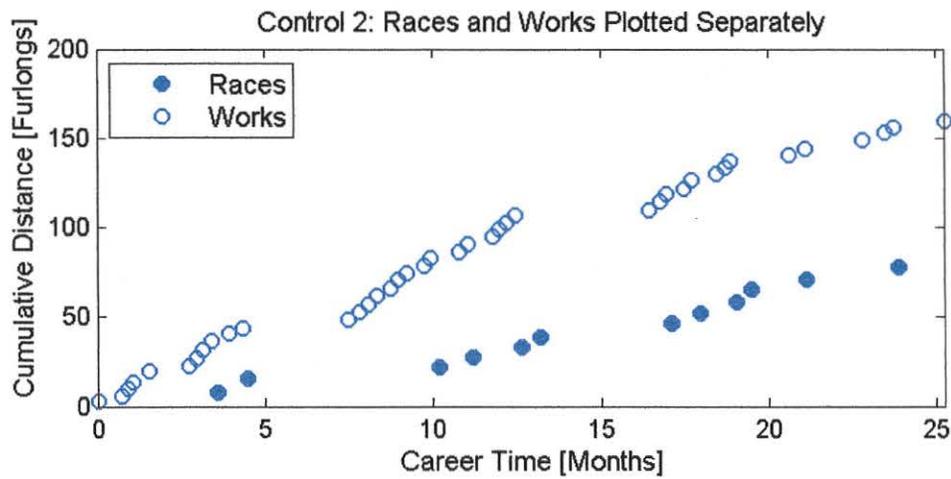
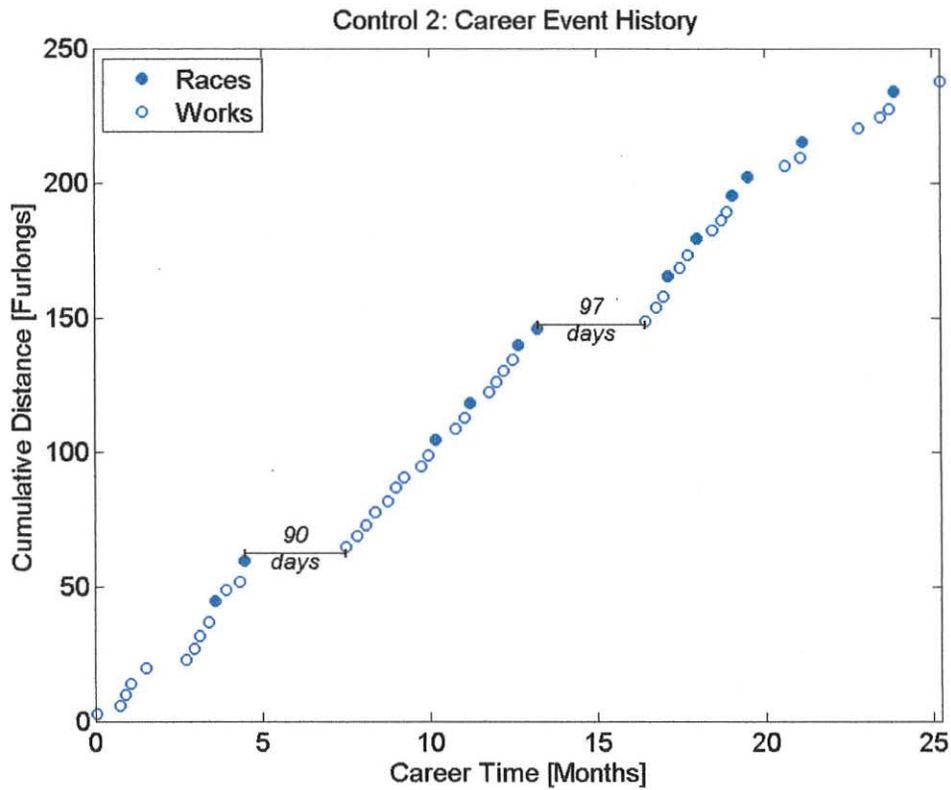
Case Horse High Speed Exercise History



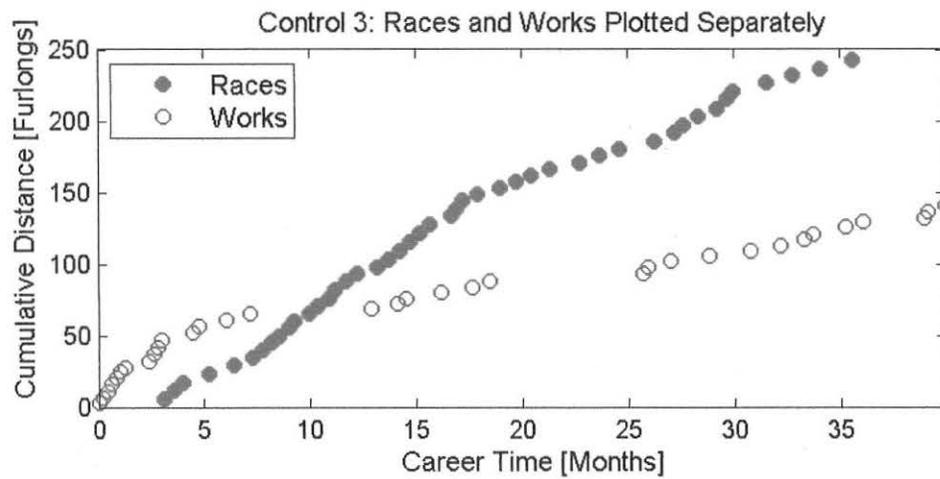
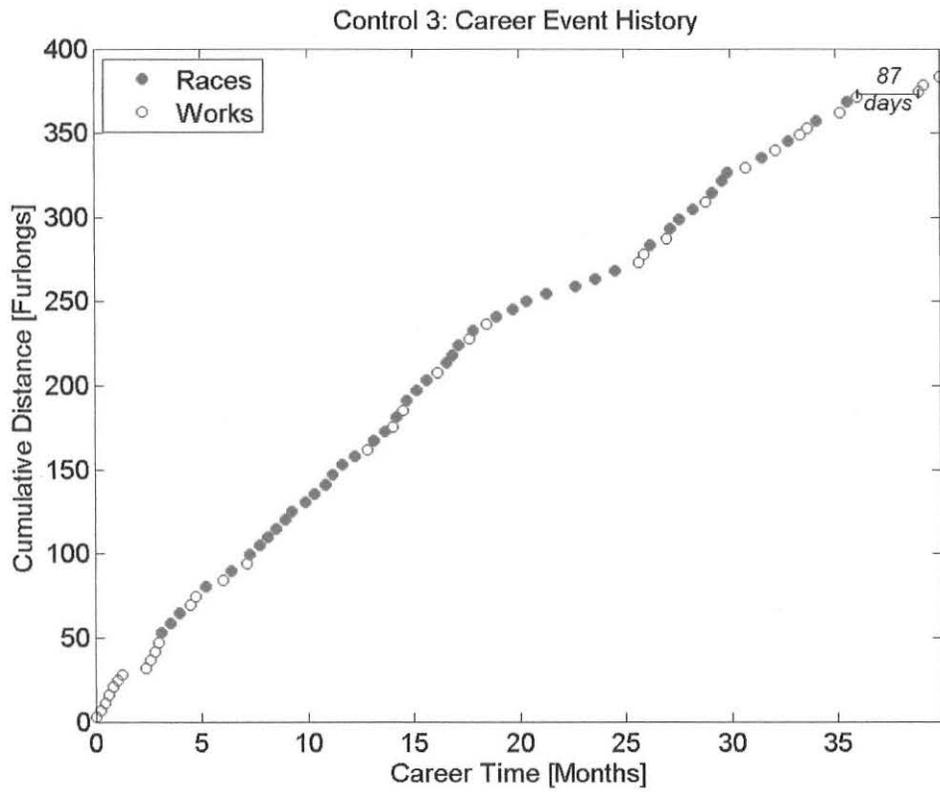
Control 1 High Speed Exercise History



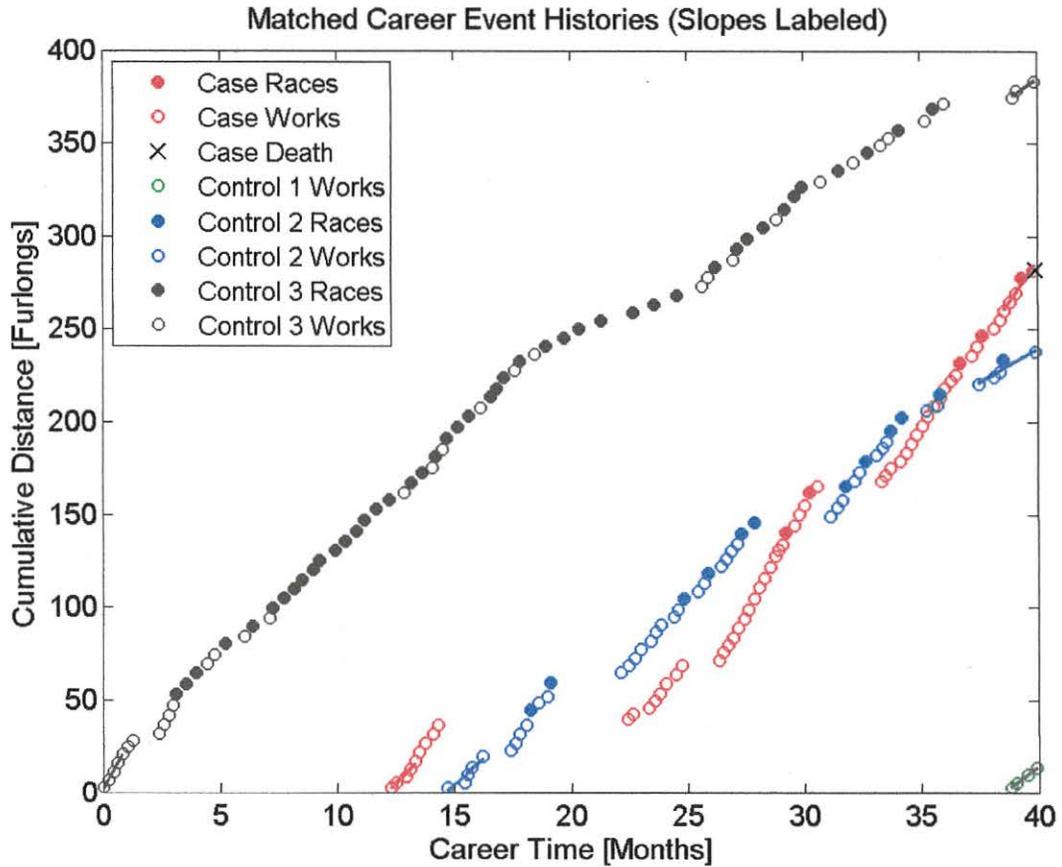
Control 2 High Speed Exercise History



Control 3 High Speed Exercise History

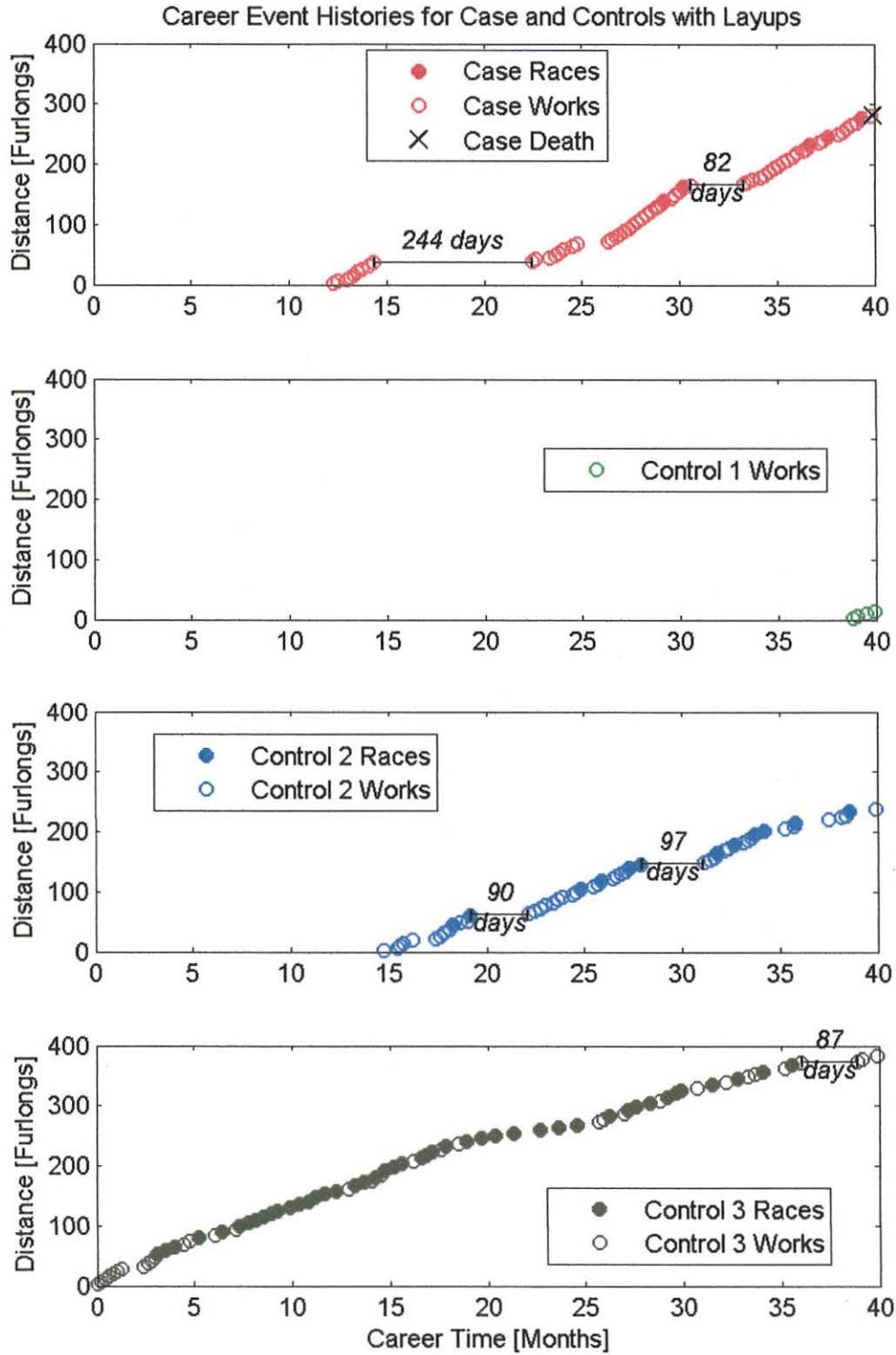


Part 2: Case and Control Horses Plotted Together

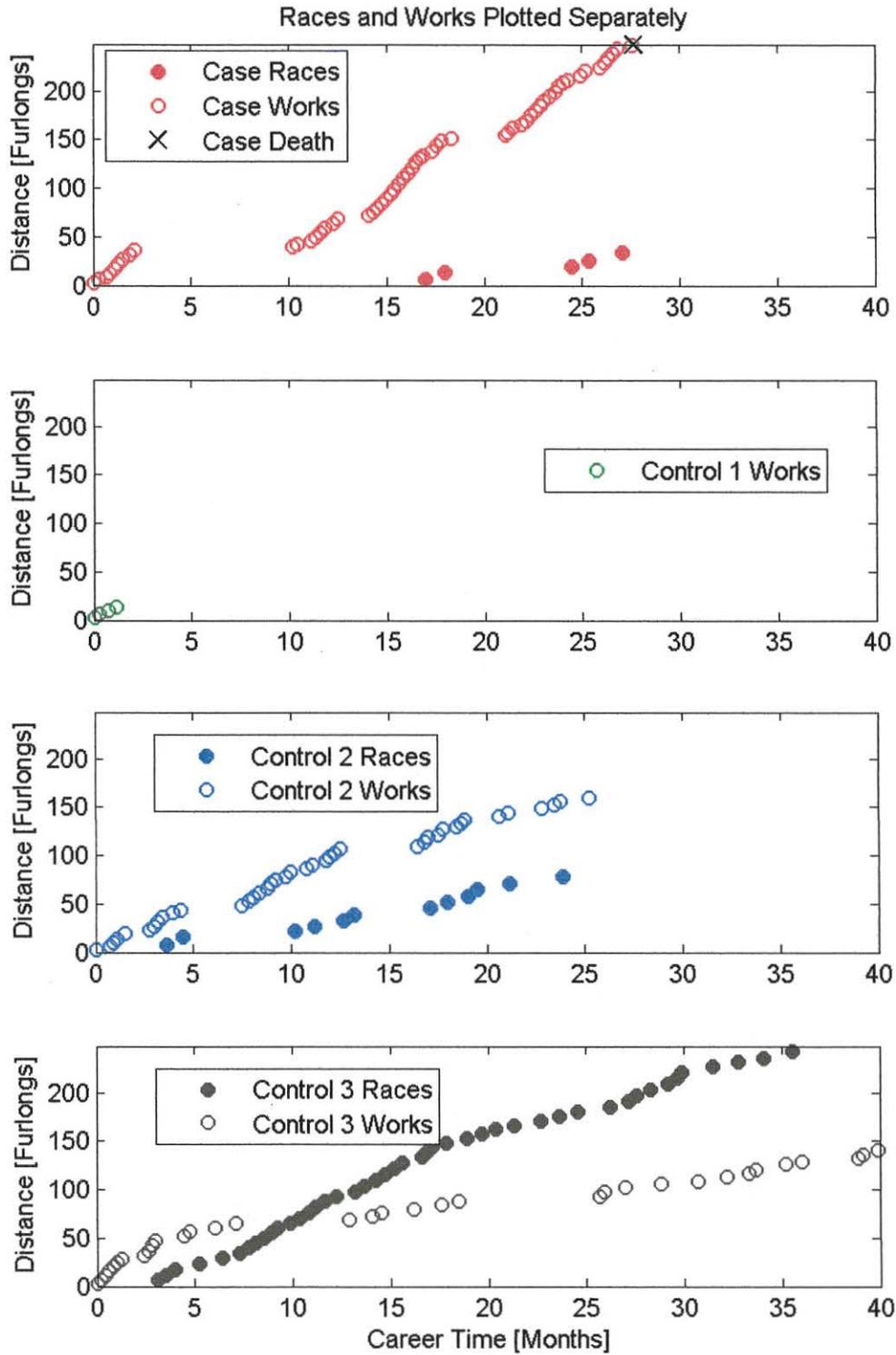


Case and Control Horses' exercise event histories are plotted on the same axes. The plots are aligned by the match date (equal to the date of death of Case Horse). Lines segments indicate specific rates of exercise at the start of career, end of career (for Case Horse), and match date (for Control Horses). 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.

Part 2: Case and Control Horses Plotted Together



Part 2: Case and Control Horses Plotted Together



Part 3: Case Horse's Event History

Date	Race/Work	Furlongs	Track	Surface	Track Cond.	Time	Age/Sex	Race Class	Earnings	Finish
3/11/2013	W	4.0	BHP	AllWthr	Fast	:49.60				
2/24/2013	R	8.0	SA	Dirt	Fast		4U/ FM	Aoc40000nw1\$/ x-N	11600	2
2/17/2013	W	5.0	BHP	AllWthr	Fast	01:00.0				
2/9/2013	W	5.0	BHP	AllWthr	Fast	01:00.0				
2/2/2013	W	5.0	BHP	AllWthr	Fast	01:00.2				
1/28/2013	W	4.0	BHP	AllWthr	Fast	:49.60				
1/20/2013	W	4.0	BHP	AllWthr	Fast	:48.60				
1/4/2013	R	6.0	SA	Dirt	Fast		4U/ FM	Msw	33600	1
12/29/2012	W	5.0	BHP	AllWthr	Fast	01:00.6				
12/22/2012	W	4.0	BHP	AllWthr	Fast	:48.60				
12/7/2012	R	6.5	BHP	AllWthr	Fast		3U/ FM	Msw	9000	2
12/2/2012	W	3.0	BHP	AllWthr	Fast	:37.80				
11/26/2012	W	4.0	BHP	AllWthr	Fast	:48.60				
11/18/2012	W	5.0	BHP	AllWthr	Fast	01:00.8				
11/12/2012	W	5.0	BHP	AllWthr	Fast	01:00.2				
11/4/2012	W	5.0	BHP	AllWthr	Fast	01:00.8				
10/27/2012	W	5.0	BHP	AllWthr	Fast	01:01.0				
10/20/2012	W	5.0	BHP	AllWthr	Fast	01:00.6				
10/13/2012	W	5.0	BHP	AllWthr	Fast	01:00.4				
10/6/2012	W	5.0	BHP	AllWthr	Fast	01:01.0				
9/29/2012	W	4.0	BHP	AllWthr	Fast	:48.20				
9/22/2012	W	4.0	BHP	AllWthr	Fast	:50.40				
9/9/2012	W	4.0	BHP	AllWthr	Fast	:49.20				
9/2/2012	W	3.0	BHP	AllWthr	Fast	:36.20				
8/28/2012	W	3.0	BHP	AllWthr	Fast	:38.00				
6/7/2012	W	3.0	BHP	AllWthr	Fast	:38.80				
5/27/2012	R	7.0	BHP	AllWthr	Fast		3U/ FM	Msw	6240	3
5/21/2012	W	5.0	BHP	AllWthr	Fast	01:00.2				

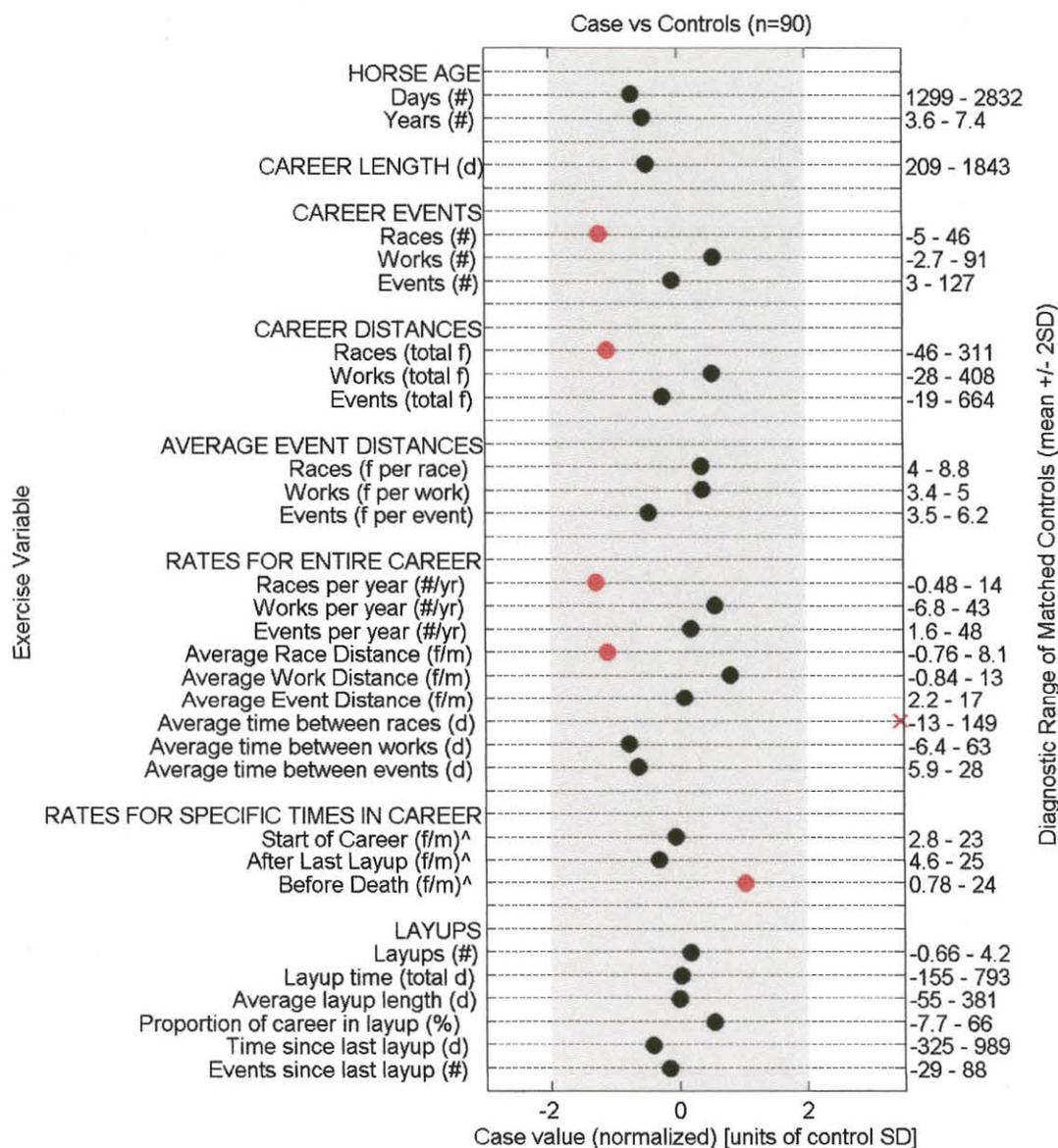
Part 3: Case Horse's Event History

Date	Race/ Work	Fur- longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn- ings	Finish
5/14/2012	W	6.0	BHP	AllWthr	Fast	01:12.6				
5/8/2012	W	4.0	BHP	AllWthr	Fast	:49.80				
4/27/2012	R	6.5	BHP	AllWthr	Fast		3U/ FM	Msw	3120	4
4/23/2012	W	3.0	BHP	AllWthr	Fast	:35.80				
4/18/2012	W	3.0	HOL	AllWthr	Fast	:36.80				
4/13/2012	W	6.0	HOL	AllWthr	Fast	01:15.0				
4/7/2012	W	6.0	HOL	AllWthr	Fast	01:13.6				
3/31/2012	W	5.0	HOL	AllWthr	Fast	01:00.4				
3/24/2012	W	6.0	HOL	AllWthr	Fast	01:12.8				
3/17/2012	W	6.0	HOL	AllWthr	Fast	01:13.2				
3/10/2012	W	5.0	HOL	AllWthr	Fast	:59.80				
3/4/2012	W	5.0	HOL	AllWthr	Fast	01:00.8				
2/26/2012	W	5.0	HOL	AllWthr	Fast	01:00.4				
2/19/2012	W	4.0	HOL	AllWthr	Fast	:47.60				
2/13/2012	W	4.0	HOL	AllWthr	Fast	:48.60				
2/7/2012	W	4.0	HOL	AllWthr	Fast	:48.60				
2/1/2012	W	3.0	HOL	AllWthr	Fast	:37.40				
12/15/2011	W	5.0	HOL	AllWthr	Fast	01:02.8				
12/8/2011	W	5.0	HOL	AllWthr	Fast	01:02.6				
11/25/2011	W	5.0	HOL	AllWthr	Fast	01:02.8				
11/17/2011	W	4.0	HOL	AllWthr	Fast	:50.40				
11/11/2011	W	4.0	HOL	AllWthr	Fast	:51.00				
11/3/2011	W	3.0	HOL	AllWthr	Fast	:37.60				
10/13/2011	W	3.0	HOL	AllWthr	Fast	:38.60				
10/7/2011	W	3.0	HOL	AllWthr	Fast	:38.40				
2/5/2011	W	5.0	HOL	AllWthr	Fast	:59.40				
1/29/2011	W	5.0	HOL	AllWthr	Fast	01:00.0				
1/19/2011	W	5.0	HOL	AllWthr	Fast	01:01.2				
1/12/2011	W	5.0	HOL	AllWthr	Fast	01:01.2				
1/6/2011	W	4.0	HOL	AllWthr	Fast	:50.40				
12/31/2010	W	4.0	HOL	AllWthr	Fast	:48.00				
12/26/2010	W	3.0	HOL	AllWthr	Fast	:37.40				

Part 3: Case Horse's Event History

Date	Race/ Work	Fur- longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn- ings	Finish
12/13/2010	W	3.0	HOL	AllWthr	Fast	:38.00				
12/6/2010	W	3.0	HOL	AllWthr	Fast	:38.60				

Part 4: Comparison of Exercise Variables between Case Horse and 90 Control Horses (5+ year old, female, Thoroughbred)

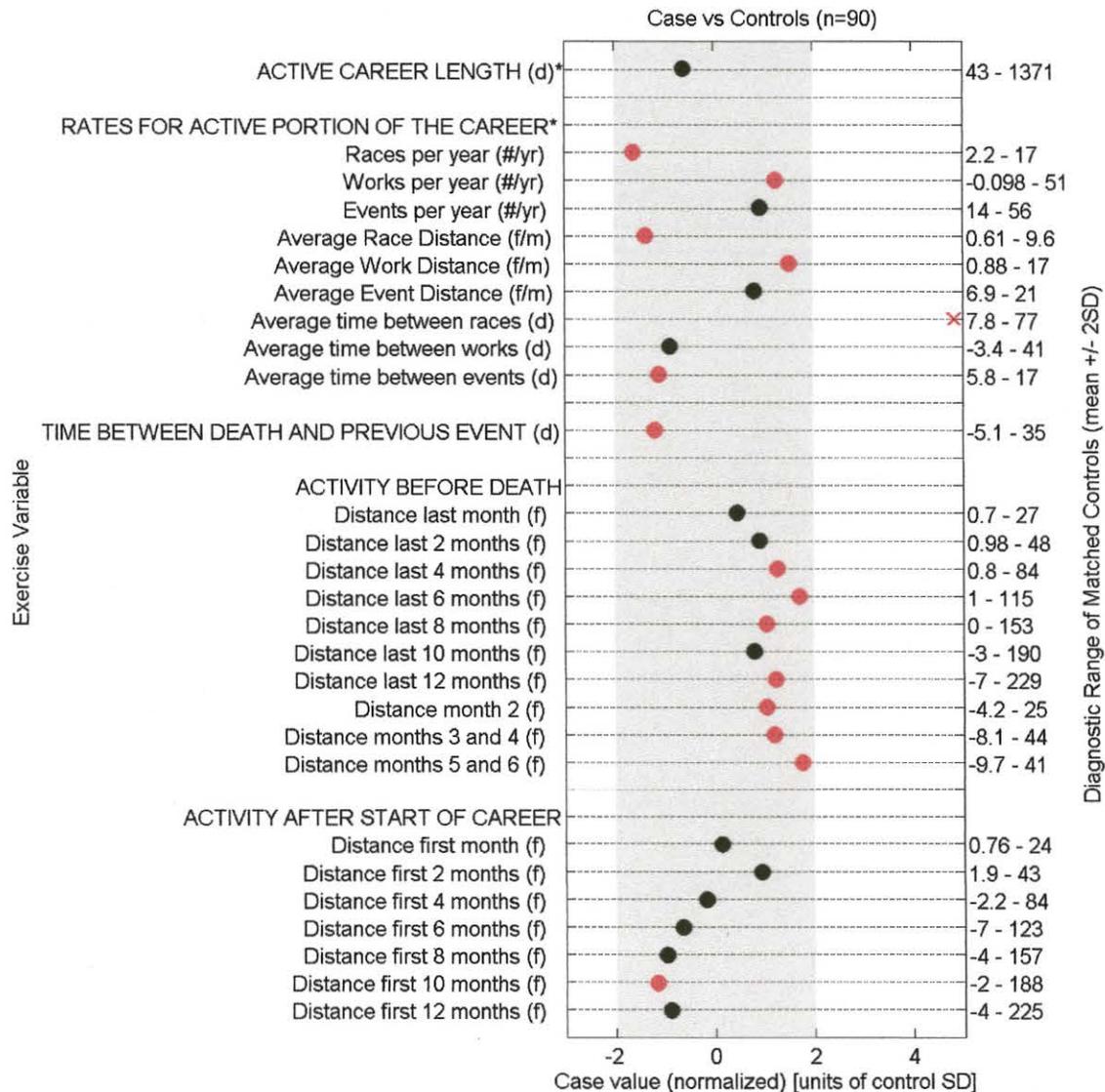


Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, female, Thoroughbreds (n=90) (gray region) (black and red indicate within 1 and 2 SD, respectively, of mean value of controls), X's indicate values outside of the normal range. Two 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.

Part 4: Comparison of Exercise Variables between Case Horse and 90 Control Horses (5+ year old, female, Thoroughbred)



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**California Animal Health & Food Safety
Laboratory System**

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San Bernardino, CA 92408-2113
(909) 383-4287

**Addendum
Version 1**

*This report supersedes all
previous reports for this case*

CAHFS Case #:Horse #7

Referral #: [REDACTED]

Date Collected: 03/14/2013

Date Received: 03/14/2013

Case Coordinator: Panayiotis
Loukopoulos, DVM, PGDipVST, PhD

Electronically Signed and Authorized

By: Loukopoulos, Panayiotis on 9/26/2013
11:17:27PM

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

Incident Track:
HOLLYWOOD PARK
RACETRACK
1050 S PRAIRIE AVE
INGLEWOOD CA 90301
County: LOS ANGELES

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	LATSON, KEITH	818-515-6789	10542 WALKER ST CYPRESS, CA 90630
Submitter	GRANDE, TIM	626-574-6355	285 W. HUNTINGTON DR Arcadia, CA 91007
Trainer	BAFFERT, BOB	818-929-1953	4244 Woodleigh Lane La Canada Flintridge, CA 91011

CHRB - Related Information

Horse's Name:	[REDACTED]	Human Injury?	N
Tattoo:	[REDACTED]	Death Related to:	Training
Age:	5.00 Years	Track Surface:	Synthetic
Gender:	Female	Location on Track:	1/8 th pole
Taxonomy:	Thoroughbred Horse	Insured?	N

Medications: "none" As Written By The Veterinarian;

Laboratory Findings/Diagnosis

Thoroughbred mare with a history of sudden death during training.

Cause of death: likely acute respiratory failure due to severe pulmonary hemorrhage and edema.

Pulmonary hemorrhage, severe, multifocal with:

1. Pulmonary edema, severe, diffuse.
2. Presence of large amounts of blood-tinged wet froth in the nasal cavities, trachea and bronchi.
3. Submandibular area, ventral neck and nostrils heavily soiled by blood-tinged dried froth.
4. Hemothorax, mild.
5. Hemorrhage, mild, focal, chronic; aortic adventitia.
6. Skeletal muscle hemorrhage, acute, moderate, multifocal, including the perineal and hind limb musculature; likely peri-mortem associated with the fall.
7. Liver, kidneys, spleen, adrenal gland: congestion, likely terminal.
8. Myocardium: mild focal congestion; incidental or terminal.
9. Pancreatic hemorrhage, acute, moderate, intralobular and interlobular, multifocal.

10. Gastric ulceration and erosion, chronic (pars esophagea) and acute (glandular), moderate, multifocal.
11. Multiple raised, round cutaneous masses (~0.5 cm in diameter), caudoventral neck area; unknown clinical significance.

Other laboratory findings:

1. No anticoagulants detected; liver.
2. No parasites detected; feces.
3. Detected liver metal levels within acceptable range for horses.
4. Detected selenium and vitamin E liver levels within acceptable range for horses.
5. *Actinobacillus equuli* ssp *haemolyticus* (moderate numbers) and *Streptococcus equi* ssp *zoepidemicus* (moderate numbers) isolated; lungs.
6. *Actinobacillus equuli* ssp *haemolyticus* isolated (small numbers); liver; likely incidental finding.
7. Mixed flora isolated (small numbers); kidney; incidental finding.
8. Mixed flora isolated (large numbers); small intestine; incidental finding.
9. No exogenous drug substances detected in the urine by LC-MS/GC-MS.

Case Summary

3/16/2013. The main necropsy findings were the severe diffuse pulmonary edema and the multifocal pulmonary hemorrhage, which are indicative of acute severe respiratory distress, the cause of which remains undetermined at this stage. No gross changes were observed in the myocardium, however histologic examination is pending. The distribution of the pulmonary hemorrhage was multifocal, but was subpleurally more marked on the mid and caudodorsal aspects of the lungs, as may be expected with exercise induced pulmonary hemorrhage. Furthermore, the presence of hemorrhage multifocally in extrapulmonary sites may be indicative of a coagulopathy. However, other conditions cannot be ruled out at this stage. A full diagnostic work up, including toxicology, bacteriology and histopathology, is currently under way and may help establish the cause of death. Please do not hesitate to contact me if you have any questions about this report.

4/19/2013. No anticoagulants were detected in the liver. The detected liver metal, selenium and vitamin E levels were within an acceptable range for horses. Histopathology (including special stains) and analytical chemistry are pending. More results to follow.

4/19/2013. Histology confirmed the presence of severe, acute hemorrhage in the lungs of this horse, which was markedly more pronounced in the dorsal segments of the lungs (see histology section). Acute respiratory failure due to severe pulmonary hemorrhage is likely the cause of death of this animal. The etiology remains unknown, following the completion of an array of tests. It should be noted that no significant cardiac lesions were observed. The pattern of the hemorrhage in the lungs (more pronounced dorsally) is consistent with the pattern often observed in exercise-induced pulmonary hemorrhage (EIPH). However, in the latter, findings indicative of previous episodes of pulmonary hemorrhage are also often present, and on that basis, a diagnosis of EIPH, although likely, cannot be firmly established in the present case.

Actinobacillus equuli ssp *haemolyticus* and *Streptococcus equi* ssp *zoepidemicus* were isolated from the lungs. Both hemolytic and non-hemolytic *A. equuli* strains are part of the normal flora of the oral cavity, the upper respiratory tract, and the gastrointestinal tract of horses and are considered opportunistic pathogens, having been associated with pneumonia, pleuropneumonia, arthritis, mastitis, metritis, peritonitis, endocarditis, meningitis, and stillbirth. *A. equuli* subsp. *haemolyticus* has, to our knowledge, been directly associated with pulmonary hemorrhage in a single case in which the hemorrhage was attributed to the endothelial damage caused by the RTX-toxin produced by the bacterium [Fatal Pulmonary Hemorrhage Associated with RTX Toxin-Producing *Actinobacillus Equuli* Subspecies *Haemolyticus* Infection in an Adult Horse. Pusterla et al J Vet Diagn Invest 2008 20: 118]. However, unlike in the present case, severe suppurative pneumonia was also present. Due to the absence of inflammation or bacteria in significant numbers in the lungs in the present case, the isolation of these bacteria from the lungs is likely an incidental finding.

The mild focal chronic lesions observed at the base of the aorta were likely the result of previous mild focal tearing of the tunica adventitia and were likely not clinically significant, given their mild focal nature and the fact that no changes were observed in the pericardium.

Analytical chemistry results are pending. The case will now be closed and re-opened when these results become available.

9/26/2013. No exogenous drug substances were detected in the urine sample submitted by LC-MS/GC-MS (report attached). Testing for this submission is complete.

Clinical History

Sudden death while galloping.

Gross Observations

Necropsy of a [REDACTED] Thoroughbred [REDACTED] began at 2.00 pm on March 14th, 2013.

The carcass was in good nutritional condition, well fleshed and with adequate amounts of fat reserves and was in mild state of post-mortem decomposition.

Large amounts of blood-tinged wet froth oozed out of the nostrils and filled the nasal cavities, trachea and bronchi. The submandibular and ventral neck areas, and, to a smaller degree, other areas of the face and neck, were multifocally heavily soiled by similar blood-tinged froth. Several very mild, round, raised cutaneous nodules (~0.5 cm in diameter) were noted in the caudoventral neck area.

The thoracic cavity and mediastinal space contained moderate amounts of free blood (~0.5 l). The lungs were markedly and diffusely enlarged, red and edematous, and bore numerous variably sized, often coalescing hemorrhagic foci that were more markedly noted (larger and more numerous) subpleurally on the dorsal mid and caudal aspect of the lungs. The aortic adventitia bore few mild ecchymoses at the level of the base of the aorta.

Very mild focal hemorrhage was noted in the cranial segment of the mesentery. A moderate, ~ 4 cm hemorrhagic focus was noted adjacent to the left adrenal gland.

The stomach contained moderate amounts of wet ingesta. The gastric glandular mucosa was diffusely moderately red and bore two elongated ~5 to 8 cm long x 1 cm wide hemorrhagic erosion foci. The esophageal region mucosa bore several round ~1 cm in diameter x 0.4 cm deep, or elongated, ~3 cm x 1 cm x 0.5 cm deep, chronic ulcers adjacent and parallel to the margo plicatus, as well as multiple linear, ~0.5 cm in width, erosion foci elsewhere in the esophageal region, oriented perpendicular to the margo plicatus; the latter coalesced focally to form a large ~5 x 7 cm erosion focus. A small hemorrhagic focus was noted in the duodenal mucosa, close to the pylorus. The small intestinal mucosa was otherwise multifocally mildly red. The small colon and rectum contained well-formed feces.

Several skeletal muscles, including the perineal and hind limb musculature, were congested and appeared multifocally moderately hemorrhagic.

No abnormalities were observed in the rest of the carcass, including the jugular veins, major arteries, esophagus, and cranium, including the ethmoid conchae and brain.

Bacteriology

BACTERIAL AEROBIC CULTURE

Animal/Source	Specimen	Specimen Type	Results
[REDACTED]	[REDACTED] 01.0002	Liver Tissue	Mixed flora Sm# Actinobacillus equuli ssp. haemolyticus Sm#
[REDACTED]	[REDACTED] 01.0003	Kidney Tissue	Mixed flora Sm#
[REDACTED]	[REDACTED] 01.0004	Lung Tissue	Mixed flora Mod# Actinobacillus equuli ssp. haemolyticus Mod# Streptococcus equi ssp. zooepidemicus Mod#
[REDACTED]	[REDACTED] 01.0005	Small Intestinal Tissue	Mixed flora Lg#

Histology

HE stained sections of the heart (11 sections), aorta, lungs (12 sections; right/left, cranial/middle/caudal and dorsal/ventral segments), brain (8 sections), liver, pancreas, spleen, kidneys, adrenal gland, skeletal muscle (various sites), stomach, small intestine, colon, mesenteric lymph node and skin were examined. Selected lung sections were stained with Perl's blue (iron), Gram, Trichrome, Toluidine blue and PAS stains. Aorta sections were stained with Perl's blue (iron) stain.

Lungs: within sections examined, there was hemorrhage in the interlobular, interstitial, and alveolar space. The severity and extent of the hemorrhage ranged from mild multifocal (right ventral cranial, right ventral caudal, left dorsal cranial, left ventral caudal sections) to severe diffuse (right dorsal caudal). The severity of the hemorrhage was graded on a scale of 0 to 5(0=absent, 1=mild, 2= mild to moderate, 3=moderate, 4=moderate to severe, 5=severe) Hemorrhage was markedly more pronounced in the dorsal compared to the ventral segments of the lungs (hemorrhage severity grade 2.83 ± 1.16 vs 1.83 ± 0.98), while there was no difference between right and left lung sections (2.33 ± 1.21 for both). Interstitial, interlobular septal, perivascular and sub-pleural fibrosis was absent or minimal. Mild or moderate edema was noted multifocally.

A small number of multifocal aggregates of coccobacilli, not associated with inflammatory response, and occasional macrophages containing intracytoplasmic phagocytized bacteria were present. Few Perl's blue positive hemosiderin laden macrophages were present, primarily in the right dorsal caudal section. Large numbers of PAS and Toluidine blue positive mast cells were observed multifocally in the right dorsal cranial and right ventral middle, and few in the right ventral caudal sections examined (3 of 12 lung sections).

Heart: the myocardium was mildly congested focally, in 1 of 11 sections examined (right atrial appendage).

Aorta: a moderate number of Perl's blue positive hemosiderin-laden macrophages, mild collagen deposition and a small number of new vessels were noted in one small focus in the tunica media at the level of the base of the aorta that grossly showed few mild ecchymoses.

Liver: mildly congested, primarily periportal. Mild, lymphoplasmacytic infiltrates were also present multifocally in periportal areas.

Kidneys: mildly congested medulla.

Pancreas: multifocally there was moderate intralobular and interlobular hemorrhage. The parenchyma was mildly autolyzed, primarily at the periphery.

Spleen: severely, diffusely congested.

Adrenal gland: mildly congested.

Stomach: moderate, acute erosion of the gastric glandular mucosa and moderate, chronic ulceration of the esophageal region mucosa were observed multifocally.

Skeletal muscle (various sites): in 2/6 sections examined there was severe intramuscular hemorrhage. Hemorrhagic foci were linear in shape and often oriented longitudinally, parallel to the myofibers. There was associated mild to moderate acute myofiber fragmentation. A small number of Sarcocystis cysts was multifocally embedded in the myofibers, in the absence of inflammatory reaction.

Parasitology

FECAL EXAM - FLOTATION

Animal/Source	Specimen	Specimen Type	Results
[REDACTED]	[REDACTED] 01.0007	Feces	No parasites seen

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 metal concentrations are within an acceptable range for horses.

Adequate liver vitamin E concentrations for horses have been reported in the literature as follows:

Newborn (1-9 days)	> 4.5 ppm
Infant (10-29 days)	> 3.0 ppm
Juvenile (30-300 days)	> 3.0 ppm
Yearling (301-700 days)	> 3.0 ppm
Adult (>700 days)	> 4.5 ppm

Thus, the detected concentration is within an acceptable range.

The submitted specimen contained none of the listed anticoagulant rodenticides in a concentration greater than the stated reporting limits.

ANTICOAGULANT SCREEN

Animal/Source	Specimen	Specimen Type
---------------	----------	---------------

[REDACTED] 01.0006 Liver Tissue

Analyte	Result	Units	Rep. Limit	Units
Brodifacoum	Not Detected	ppm	0.01	ppm
Bromadiolone	Not Detected	ppm	0.05	ppm
Chlorophacinone	Not Detected	ppm	0.25	ppm
Coumachlor	Not Detected	ppm	0.05	ppm
Difethialone	Not Detected	ppm	0.25	ppm
Diphacinone	Not Detected	ppm	0.25	ppm
Warfarin	Not Detected	ppm	0.05	ppm

HEAVY METAL SCREEN

Animal/Source Specimen Specimen Type
 [REDACTED] 01.0006 Liver Tissue

Analyte	Result	Units	Rep. Limit	Units	Ref. Range
Lead	Not Detected	PPM	1	PPM	<3.0
Manganese	1.7	PPM	0.040	PPM	1-6
Iron	250	PPM	0.200	PPM	100-300
Mercury	Not Detected	PPM	1.000	PPM	<1.0
Arsenic	Not Detected	PPM	1	PPM	<1.0
Molybdenum	1.1	PPM	0.400	PPM	<2.0
Zinc	47	PPM	0.100	PPM	40-125
Copper	5.3	PPM	0.100	PPM	4-7.5
Cadmium	3.1	ppm	0.300	ppm	<20

SELENIUM - TISSUE/OTHER

Animal/Source	Specimen	Specimen Type	Results	Units	Rep. Limit	Ref. Range
[REDACTED]	01.0006	Liver Tissue	0.51	ppm	0.020ppm	0.3-1.0

VITAMIN E

Animal/Source	Specimen	Specimen Type	Results	Units	Rep. Limit
[REDACTED]	01.0006	Liver Tissue	25	ppm	2.000

Appendix - Report Related Images

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CALIFORNIA ANIMAL HEALTH & FOOD SAFETY
LABORATORY SYSTEM
P.O. BOX 1770
DAVIS, CALIFORNIA 95617

PHONE: (530) 752-8700
FAX: (530) 752-6253

April 8, 2013

Franciso Uzal, DVM
CAHFS-San Bernardino
105 W. Central Ave.
San Bernardino, CA 92408

INVESTIGATION: Post-Mortem Testing (S1302055)

Received: March 26, 2013
Laboratory No.: EACL-130326-19
No. of Samples: 1

The urine sample was delivered on March 26, 2013 via Golden State Overnight.

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

The sample was found to contain no foreign substance.

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 samples will be stored at the Maddy Lab and disposed of after 60 days.

Sincerely,

A handwritten signature in cursive script that reads "Scott D. Stanley".

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