HORSERACING INTEGRITY AND SAFETY AUTHORITY

HISA's Review of Equine Fatalities During the 2023 Saratoga Race Course Meet

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I. INTRODUCTION

The Horseracing Integrity and Safety Act was passed by Congress to protect the health and safety of horses and riders, and the integrity of horse racing. Since July 2022 when the Horseracing Integrity and Safety Authority's ("HISA") Racetrack Safety Program was first launched, HISA has been working relentlessly to develop policies and regulations to protect horses and riders and to nurture a culture that prioritizes horse welfare above all else. In furtherance of those objectives, HISA launched its Anti-Doping and Medication Control Program ("ADMC Program") on May 22, 2023. Since that time, approximately 60,000 horses have been tested in accordance with the strict regulatory regime of the ADMC Program. Creating this ecosystem of care around horses continues to be HISA's primary objective in its inaugural years.

Consequently, because of an unusually high number of equine racing fatalities during the 2023 Saratoga Race Course Meet (the "2023 Meet"), HISA initiated an independent review of those occurrences to ascertain whether there were any patterns or statistically significant findings to help explain those 14 training and racing fatalities. (The report does not include consideration of equine fatalities caused by medical conditions not associated with racing.)

This report therefore examines the potential risk factors present during the 2023 Meet that might be associated with the equine injuries at issue. First, HISA representatives reviewed the implicated racetrack surfaces, including the condition of the dirt and turf tracks, track maintenance and equipment utilized. Second, the potential impact of weather on injury risk was considered given the unprecedented amount of rain during the 2023 Meet. Third, veterinary history and associated necropsies were examined for insight into potential veterinary commonalities between the horses. Fourth, the exercise history of each horse was considered in comparison to an equal cohort of control horses. Fifth and finally, there was review of any potential HISA rule violations that may have contributed to the injuries.

The learnings from this review are contained herein and have been shared with the New York State Gaming Commission ("NYSGC") and the New York Racing Association ("NYRA").

II. SCOPE OF REVIEW

The following documents were examined in connection with HISA's review:

A. All racetrack surface data collected by the Racing Surfaces Testing Laboratory ("RSTL") for the 2023 Meet along with historical data;
B. Information regarding the locations of the injuries on the Saratoga turf and dirt racing surfaces;
C. The October 16, 2023 Saratoga Racetrack Evaluation prepared by HISA's Track Surface Advisory Group ("TSAG");
D. All available veterinary histories of each deceased horse;
E. Observations of the HISA Director of Equine Safety & Welfare from her meetings with Saratoga Race Course's Regulatory Veterinarians;
F. Observations of the HISA Director of Equine Safety & Welfare from the mortality reviews conducted on the deceased horses;
G. Historical racing fatality data for Saratoga Race Course, as found in the Equine Injury Database;
H. Publicly available race- and training-related information for each deceased horse;
I. The necropsy summaries of each deceased horse;
J. The expert opinion and report of Dr. Alina Vale, an equine veterinarian with expertise in necropsies retained by HISA to review the necropsy reports;
K. Analysis of all relevant data in the HISA portal, the platform where racing participants under HISA's purview register and report a variety of information, including equine treatment records; and
L. The expert analysis of the affected horses' high-speed exercise histories by Dr. Susan Stover, Chair of HISA's Racetrack Safety Committee and Professor of Veterinary Surgical & Radiological Sciences at the University of California, Davis.

III. CHRONOLOGY

The following section contains a chronology of events relevant to HISA's review. All horses that collapsed or sustained injuries as set forth in the chronology below were subsequently euthanized.

- July 13, 2023: The 2023 Meet begins.
- July 15, 2023: *Frigid Lady* sustains biaxial proximal sesamoid bone fractures during a workout.
- July 20, 2023: *Winter Son* sustains an open lateral condylar fracture and biaxial proximal sesamoid bone fractures during a workout.
- July 23, 2023: *Blame It On Mary* sustains biaxial proximal sesamoid bone fractures during the third race.
- August 2, 2023: *Lawful* sustains biaxial sesamoid bone fractures during a workout.
- August 3, 2023: *Sopran Basilea (IRE)* sustains an open, comminuted P1 fracture, and distal sesamoidean and suspensory ligament ruptures galloping out after the ninth race.
- August 4, 2023: Saratoga Race Course cancels the final four races of the card due to severe thunderstorms and torrential rain.
- August 5, 2023: *Maple Leaf Mel* sustains an open fetlock luxation with lateral condylar fracture and suspensory apparatus failure at the level of the sesamoid bones during the eighth race.
- August 6, 2023: *Closed Caption* sustains biaxial sesamoid bone fractures galloping out after a workout.
- August 6, 2023: *Ever Summer* sustains an open fetlock luxation with lateral condylar fracture and suspensory apparatus failure at the level of the sesamoid bones during the fourth race.
- August 16, 2023: *Wisecracken* sustains an open lateral condylar fracture during the fifth race.
- August 23, 2023: *Burning Bright* collapses during the seventh race.
- August 25, 2023: *La Aguililla* sustains a suspensory ligament injury during the second race.
- August 26, 2023: *Nobel (IRE)* sustains a complex fetlock injury galloping out after the fifth race.
- August 26, 2023: *New York Thunder* sustains a mid-cannon bone fracture during the ninth race.
- August 27, 2023 – September 3, 2023: HISA's Director of Equine Safety and Welfare is on-site and meets with various stakeholders and NYRA officials.[1]

[1] NYRA is the franchise holder and operator of Saratoga Race Course.

- August 29, 2023: *Shutters* dies in the barn stall.
- August 29, 2023: HISA TSAG members Jim Pendergest and Jake Leitzel arrive on-site to conduct inspection of the dirt and turf racing surfaces.
- August 30, 2023 – September 3, 2023: HISA's Compliance Veterinarian assists with the post-entry screening for the races run on these days.

IV. HISA'S REVIEW

A. Racetrack Surface

On August 29, 2023, HISA TSAG members Jim Pendergest and Jake Leitzel arrived at Saratoga Race Course to conduct an onsite inspection of the racing surfaces.[2] Their evaluation consisted of a review of historical track surface and rainfall data, assessment and inspection of the track maintenance equipment and procedures, testing of the main track, and inspection of the inner and outer turf course. Their findings are set out in full in the October 16, 2023 Saratoga Racetrack Evaluation[3] and summarized below.

Their evaluation began with an inspection of all pertinent maintenance equipment, including harrows, floats, rollers, tractors and graders. The equipment was found to be properly adjusted and the track's maintenance routines were observed to be consistent with industry standard operating procedures. The drainage system on both the main and turf tracks were assessed and no areas of concern were identified.

Testing was then performed on the main track surface and included measurements of the cushion depth, total depth of material over the base, surface slopes at each 1/8 of a mile and moisture measurements at each 1/16 of a mile at 3, 7 and 15 feet using the standard time-domain reflectometry measurement. Compared to prior years, the surface was found to be slightly firmer than 2022, but slightly softer than 2021. The standard deviation improved from 1.6 in 2022 to 1.0 in 2023, meaning that the track was very consistent in 2023 from pole to pole. No areas of concern were presented from the testing results.

The inner and outer turf courses were inspected for moisture at each 1/16 pole at 3, 7, and 15 feet and slopes at each 1/8 mile marker pole. No weeds or invasive grasses were observed on either course. No sign of fungus or disease of any kind was present on either turf course. The stand of grass was dense and healthy on both courses.

In conjunction with their track surface testing, the TSAG compared rainfall amounts for the 2023 Meet with historical rainfall data for the periods encompassing the 2021 and 2022 summer meets. Their findings confirmed 8.69 inches of rainfall during the 2021 meet, 7.76 inches during the 2022 meet and 11.03 inches during the 2023 Meet. While the increase in rainfall from 2021 to 2023 is only 2.34 inches over approximately 6 weeks, the occurrence of small amounts of rain on multiple days forced 65 races to be taken off the turf. The TSAG, however, found no clear association of weather to the series of

[2] HISA's TSAG is comprised of seven seasoned track superintendents whose expertise spans dirt, turf and synthetic surfaces. These individuals are available to conduct on-site racetrack inspections on an emergency basis. *See* HISA Announces New Track Surface Advisory Group - Horseracing Integrity and Safety Authority (hisaus.org).

[3] A copy of the October 16, 2023 Saratoga Racetrack Evaluation is attached as Appendix I.

catastrophic breakdowns, nor did they find any correlation between the track condition ratings and the on-course incidents.[4]

Location of equine fatalities on the Racetrack

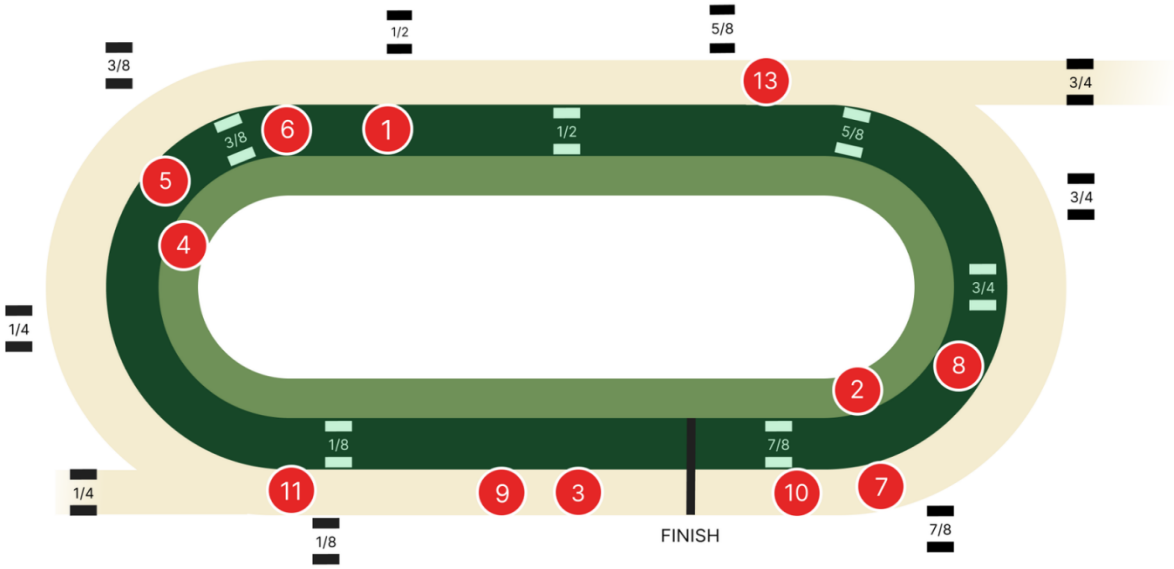
The locations of 12 of the 13 training- and racing-related fatalities on the turf and main track racing surfaces are plotted on the diagram on the next page. (Note that one fatality is not included here because it is not relevant to this analysis as the injury was diagnosed after the workout and it cannot be determined with reasonable certainty where the injury occurred.) Six of the fatal musculoskeletal injuries were reported to occur on the dirt track (La Aguililla (No. 7) sustained a soft-tissue injury), with four injuries occurring between the 1/8 mile and 7/8 mile pole, immediately before and after the finish line.

Three of the fatal musculoskeletal injuries were reported to occur on the outer turf course and two fatal musculoskeletal injuries reportedly occurred on the inner turf course. Of the three on the outer course, one was at the 7/16 pole, one at the 5/16 pole and one on the gallop out after the race. Of the two on the inner course, one was at the 1/4 pole, and one was on the gallop out. Based on this information, there does not appear to be any correlation between the injuries and the location on the tracks.

[4] However, data available to HISA indicate that the rainfall could have played a role in the increased likelihood of a horse being fatally injured during the 2023 Meet, though additional track surface data is needed to quantify the extent of any increase in risk. *See* 2023 Saratoga Race Course Meet Rainfall Graphs, attached as Appendix II.

Equine Fatalities at Saratoga Race Course

7/15/2023 - 8/26/2023



1. **Blame It On Mary (7/23/2023)** Outer turf course, 7/16ths pole
2. **Sopran Basilea (8/3/2023)** Inner turf course, during gallop out mid-first turn
3. **Maple Leaf Mel (8/5/2023)** Dirt course, “final 70 yards”
4. **Ever Summer (8/6/2023)** Inner turf course, mid-turn between 3/8ths and 1/4th poles
5. **Wisecracken (8/16/2023)** Outer turf course, 5/16ths pole
6. **Burning Bright (8/23/2023)** Outer turf course, exercise-associated sudden death approaching 3/8ths pole
7. **La Aguililla (8/25/2023)** Dirt course, during gallop out, DOD 9/13
8. **Nobel (IRE) (8/26/2023)** Outer turf course, during gallop out, mid-first turn
9. **New York Thunder (8/26/2023)** Dirt course, outside the 1/16th pole
10. **Frigid Lady (7/15/2023)** Dirt course, during gallop out, before entering turn
11. **Winter Son (7/20/2023)** Dirt course, 1/8th pole
12. **Lawful (8/2/2023)** Breezed on main dirt course, walked home, injury dx at barn
13. **Closed Caption (8/6/2023)** Dirt course, 5/8ths pole

*Pole and injury locations are approximate.

B. Veterinary Review

1. *Injury Presentation*

There were 14 equine fatalities during the 2023 Meet.[5] The causes of the fatalities can be summarized as follows:

- 1 exercise-associated sudden death
- 1 sudden death in the barn area
- 4 fractures sustained in training on the dirt track
- 5 fractures sustained in racing on the turf track
- 2 fractures sustained in racing on the dirt track
- 1 significant soft-tissue injury sustained in racing on the dirt track

Of the 12 horses with musculoskeletal fatalities, only two of the horses' most recent races were in Saratoga. The majority of horses (8) had at least one breeze in Saratoga, though not necessarily over the racing surface where the fatal injury ultimately occurred.

Of the 11 horses with fractures, ten involved the metacarpal- or metatarsal-phalangeal joint ("ankles," or "fetlocks"). Two had an associated proximal phalanx ("pastern") fracture, and one involved the third metacarpal bone.

Three of the 11 horses with fatal fractures were reported to have received intra-articular injections of corticosteroids in the affected joint within 30 days of injury.

One of the horses sustaining a fracture was on the veterinarians' list as unsound at the time of the injury.[6] Two others had previously spent time on the veterinarians' list as unsound. Appearance on the veterinarians' list is strongly associated with future fatal injury.[7]

The five musculoskeletal fatalities on the turf courses at Saratoga represented an appreciable deviation from the musculoskeletal racing fatality rate on the turf as compared to previous years. In 2018, one racing fatality occurred on the turf; in 2019,

[5] As set out above, this review does not include the three horses that were euthanized as a result of medical conditions during the 2023 Meet.

[6] A horse on the veterinarians' list is prohibited from competing in a race, though the horse may continue training activities during rehabilitation.

[7] Georgopoulos, S. P., & Parkin, T. D. (2016). Risk factors associated with fatal injuries in Thoroughbred racehorses competing in flat racing in the United States and Canada. Journal of the American Veterinary Medical Association, 249(8), 931-939.

there were no racing fatalities on the turf; in 2020, there was one; in 2021, there were two; and in 2022, there were none.[8]

While the increased rainfall in 2023 is suggestive of heightened risk, the first seven musculoskeletal fatalities occurred on courses rated as fast or firm which means that the tracks were both in their "least moisture" condition. It should also be noted that no musculoskeletal fatalities occurred during the entire season the Oklahoma turf and dirt tracks were open for training at Saratoga Race Course.[9]

2. *Necropsy Summary*

Dr. Alina Vale[10] reviewed the necropsy reports along with other pertinent medical information for each fatality at Saratoga during the 2023 Meet.[11] Although unable to identify a singular cause for the fatalities, Dr. Vale made the following observations and underscored what she considered to be significant elements of the necropsy reports:

a. In the necropsy reports of the fracture cases, typical pre-existing lesions associated with a fracture were not described (it is possible that the absence of identified lesions is attributable to necropsy variability in racehorse-specific training and technical skill to detect lesions); and

b. In 90% of the fracture cases, the fracture occurred at the fetlock joint, whereas in other populations of racehorses approximately 50% of fatal musculoskeletal injuries occur at the fetlock joint.

3. *High-Speed Exercise Analysis*

Dr. Susan Stover[12] analyzed the lifetime high-speed exercise history (official timed works and races) of the 12 horses that died or were euthanized at Saratoga Race Course because of a musculoskeletal injury.[13] Their lifetime high-speed histories were compared with 3 control horses per injured horses matched by participation in the last event (official timed work or race) of the injured horse (exercise histories for control horses are truncated to the date of death of the injured horse). Thus, the deceased horses are similar in age, sex and quality to the control horses.

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[8] The Jockey Club Equine Injury Database. Equine Fatality Summary for Saratoga, accessed November 28, 2023. *See* https://jockeyclub.com/pdfs/eid/Saratoga.pdf

[9] Ehalt, Bob. "No Fatal Breakdowns During Seven months on Oklahoma." BloodHorse, Nov. 20, 2023. *See* https://www.bloodhorse.com/horse-racing/articles/273507/no-fatal-breakdowns-during-seven-months-on-oklahoma

[10] *See* Appendix III for Dr. Alina Vale's Curriculum Vitae.

[11] *See* Appendix IV for a summary of Dr. Vale's report.

[12] *See* Appendix V for Dr. Susan Stover's Curriculum Vitae.

[13] This excludes the two fatalities attributable to sudden death.

The exercise histories were reduced to 65 variables. Univariate conditional logistic regression was used to find variables that may be different between injured and control horses. Two variables became apparent that are likely different between injured and control horses (p=0.04-0.08). Injured (case) horses had more races per year during actively racing periods (i.e., periods without a layup >60 days) and on average more furlongs in races per month when actively racing than control horses. Adjusted for the difference in mean values between injured and control horses, based on number of races averaged over one year for periods of active racing, the injured horses were 2.5 times more likely to be injured than control horses. Details can be found in Dr. Stover's full analysis (including graphs), attached to this report as Appendix VI.

This analysis suggests there are horse level risk factors that likely contributed to risk for injury. The factors observed are consistent with our knowledge of repetitive, overuse (fatigue) injuries in racehorses. Frequent high intensity exercise (as observed in injured horses) that does not allow for recovery of exercise-induced microdamage contributes to the development of stress fractures and subchondral stress remodeling which predispose horses to catastrophic injuries.[14]

[14] Cresswell EN, Ruspi BD, Wollman CW, Peal BT, Deng S, Toler AB, McDonough SP, Palmer SE, Reesink HL. *Determination of correlation of proximal sesamoid bone osteoarthritis with high-speed furlong exercise and catastrophic sesamoid bone fracture in Thoroughbred racehorses.* Am J Vet Res. 2021 Jun;82(6):467-477. doi: 10.2460/ajvr.82.6.467. PMID: 34032482.

V. RULE VIOLATIONS / PROCEDURAL DEFICIENCIES

HISA's review did not reveal any violations of HISA's rules by any Covered Persons that contributed directly to the injuries covered in this report. However, this review revealed violations by Covered Persons of HISA's veterinary and horse reporting rules. While the number of reporting violations has continued to decrease since implementation of HISA's Racetrack Safety Program, the timeliness and thoroughness of reporting, as required by HISA's rules, must continue to improve going forward to optimize HISA's ability to protect equine welfare.

1. *Veterinary Reporting*

   Rule 2251(b) requires veterinarians to submit treatment records to HISA within 24 hours of treatment or examination. Review of the subject horses' veterinary treatment history revealed some gaps in reporting. The purpose of this reporting is to discover high-risk practices so that injuries and illnesses can be prevented in the future. Knowledge of medication, treatments, examinations and surgical procedures is necessary to correlate certain practices with risk for injury and illness, so that high-risk practices can be discovered, and injuries and illnesses can be prevented in the future. Collection and correlation of the information with data on injuries and illnesses will enhance equine welfare by allowing the development of strategies for injury and illness prevention. HISA has begun enforcement of such requirements nationally, and compliance rates have improved significantly in the second year of the Racetrack Safety Program.

2. *Horse Registration and Information Accuracy*

   Covered Persons are required to register their Covered Horses and keep the information in each horse's record current pursuant to HISA Registration Rule 9000(i). Of the 14 horses covered in this review, three reflected an incorrect physical location of the horse in the portal at the time the fatality occurred. Having accurate information about the locations of all horses under HISA's jurisdiction is a fundamental underpinning of HISA's ADMC Program which, in turn, helps to assure the integrity of racing.

VI. CONCLUSION AND FOLLOW-UP

This report concludes that there are a multitude of risk factors that likely contributed to the fatalities during the 2023 Meet. These findings will drive HISA's data collection, recommended racetrack practices and regulatory scheme going forward.

The TSAG did not find any clear association between known risk factors and the spike in equine injuries based on their testing and inspection of the racing surfaces during the 2023 Meet. However, the significantly increased rainfall during the 2023 Meet compared to previous years cannot be overlooked (11.03 inches in 2023, compared to 8.69 in 2021 and 7.76 in 2022) and available data suggests that the rainfall could have played a role in the increased risk of fatal injury during the 2023 Meet. HISA is working cooperatively with the Racing Surfaces Testing Laboratory to collect and analyze additional track surface data to better understand the effects of weather on racetrack maintenance.

The veterinary findings were concentrated on the fetlock joint where 90% of these injuries occurred (11 of 12 horses). Significantly, 3 out of 11 horses received corticosteroid injections in the affected joint within 30 days of racing. This finding lends further support to HISA's proposed rule change currently under review by the Federal Trade Commission which would prohibit corticosteroid injections to the fetlock joint within 30 days of a race.

Finally, an analysis of the exercise histories of the deceased horses showed that horses having participated in more frequent high intensity exercise and furlongs were 2.5 times more likely than the control group to be injured.

Following the learnings from this report, alongside other HISA reviews conducted over the past year, HISA has developed, in partnership with Palantir Technologies, a data analytics tool that will flag horses at potential risk for injury to assist stakeholders in identifying horses that warrant further evaluation. We are hopeful that this powerful tool will contribute to a reduction in equine injuries once it is implemented.

Appendix I:

October 16, 2023 Report of HISA's Track Surface Advisory Group

Racing Surfaces Testing Laboratory

907 National Ave
Lexington, KY 40502
(207) 570 – 9869

Saratoga Racetrack Evaluation

TO: Ann McGovern

FROM: Track Surfaces Advisory Group

CC: Glen Kozak, VP, Operations & Capital Projects

DATE: October 16, 2023

SUBJECT: Saratoga Racetrack Evaluation Summary

On August 29, Track Surfaces Advisory Group members Jim Pendergest and Jake Leitzel arrived at Saratoga Race Track to conduct an onsite inspection of the racing surfaces.

Prior to arriving on site, Racing Surfaces Testing Laboratory (RSTL) test results from 2021 through 2023 were received and reviewed. Upon arrival Tuesday morning, all pertinent maintenance equipment, including harrows, floats, rollers, tractors and graders were inspected and drainage as well as water management systems were evaluated. Equipment operation was observed during the second morning renovation break at 8:30 am. Standard procedures were followed by the track maintenance staff.

Inspection of the equipment found that the harrows were properly adjusted to account for tooth wear and the track maintenance crew was capable of properly adjusting the equipment when switching between harrows and floats. The observed maintenance routines were consistent with the standard operation procedures documented in the most recent version of the RSTL Maintenance Guide. The surfaces showed good consistency and there was no evidence of separation or loss of materials due to rainfall over the summer season.

After training the main track was harrowed and left open to dry out from the previous night's rain. Testing, review and measurements throughout the remainder of the day by Pendergest and Leitzel included, cushion depth measurements, total depth of material over the base, surface slopes at each one-eighth of a mile and moisture measurements at each one-sixteenth of a mile at 3, 7 and 15 feet using the standard time-domain reflectometry measurement.

A review of RSTL's testing of the main track for 2021, 2022 and 2023 showed that during the pre-meet inspection, the surface was slightly firmer in 2023 when compared with 2022, but slightly softer than 2021. The standard deviation improved, from 1.6 in 2022 to 1.0 in 2023, meaning that the track was very consistent this year from pole to pole. No areas of concern were presented from the testing results.

The drainage system on both the main and turf tracks were assessed. Drainage was open and free flowing to the interior on the turf. The drainage of the main track, like all dirt tracks, is across the surface of the sealed track. Proper grading is necessary to keep the water from pooling and a clear path to an inside

drainage channel is needed. The collection channel on the inside rail was clear and free of obstructions. There was no evidence of crowfooting on the surface where water would have either scoured the surface or pooled.

During the afternoon, both the inner turf course and the outer turf course were inspected for moisture at each one-sixteenth pole at 3, 7 and 15 feet and slopes at each one-eighth marker pole. The turf crew staff was witnessed repairing divots with a sand-seed mixture and then rolling the outer turf course with a small, steel, double drum roller to smooth the surface. All divots were adequately repaired and some were already showing seedlings sprouting from repairs earlier in the meet. The turf roots on both tracks were inspected using a Turf Tech Profile Sampler and a dense root structure with a 5-inch root depth on the outer turf and 6-inch root depth on the inner turf. No weeds or invasive grasses were observed on either course. No sign of fungus or disease of any kind was present on either turf course. The stand of grass was dense and healthy on both courses.

A review of weather data shows 8.69 inches of rainfall during the 2021 meet, 7.76 inches during 2022 and 11.03 inches during 2023. While the increase in rainfall from 2021 to 2023 is only 2.34 inches over approximately 6 weeks, the occurrence of small amounts of rain on multiple days forced 65 races to be taken off of the turf. While the numerous days of rain affected the number of races run on the turf, we found no clear association of weather to the series of catastrophic breakdowns. A review of the track condition rating for the races where the incidents occurred show that of the two on dirt, one was on a fast track and the other was on a sealed/muddy track. Of the 5 that occurred on the turf course (the cardiac event is not included in this analysis), three were on turf courses rated as good and two were on turf courses rated as firm. Consequently, there does not appear to be a correlation between the course ratings that were associated with weather events and the on-course incidents.

Further analysis of the incidents shows that three occurred on the outer turf course and two on the inner turf course. Of the three on the outer course, one was at the 7/16 pole, one at the 5/16 pole and one on the gallop out after the race. Of the two on the inner course, one was at the quarter pole and one was on the gallop out. Therefore, we could find no correlation between the injuries and the location on the tracks.

One other interesting observation was that one of the five turf incidents was a sprint race, the other four were races greater than 1 1/8 miles. Historically, more incidents have occurred in shorter races[15].

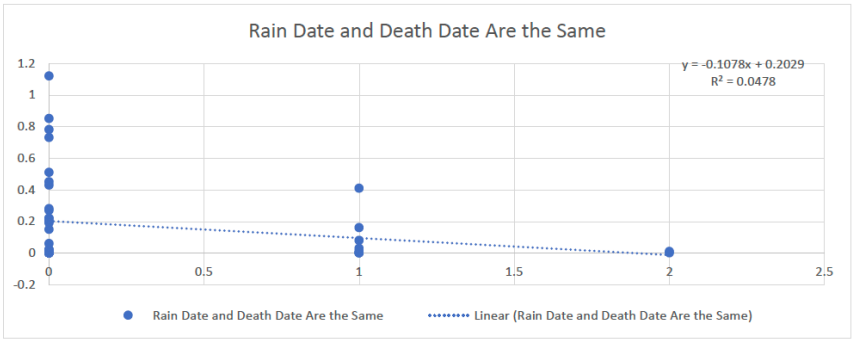
In conclusion, the review of the RSTL data and the inspection of the racing surfaces did not find any clear association between known risk factors and the spike in equine injuries at Saratoga Racetrack this season. While the track surface data available for Saratoga for the summer of 2023 exceeds all of the requirements of HISA regulations, more information regarding the condition of the track at the time of the incidents would be beneficial. Future efforts should focus on increasing the details of the track condition and real time data.

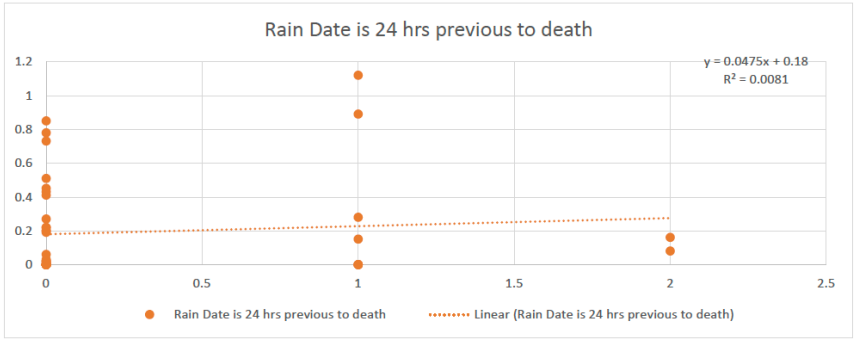
[15] Georgopoulos, S. P., & Parkin, T. D. (2016). Risk factors associated with fatal injuries in Thoroughbred racehorses competing in flat racing in the United States and Canada. Journal of the American Veterinary Medical Association, 249(8), 931-939.

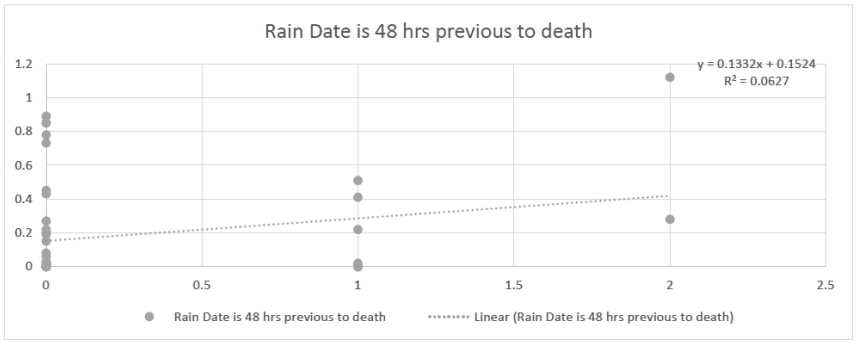
Appendix II:

2023 Saratoga Race Course Meet Rainfall Graphs

			RainShift	
Row Labels	Horse Death	Rain	1 day	2 day
7/12/2023	0	0		
7/13/2023	0	0		
7/14/2023	0	0.89		
7/15/2023	1	0.03	0.89	0
7/16/2023	0	0.73	0.03	0.89
7/17/2023	0	0.22	0.73	0.03
7/18/2023	0	0.51	0.22	0.73
7/19/2023	0	0	0.51	0.22
7/20/2023	1	0	0	0.51
7/21/2023	0	0.22	0	0
7/22/2023	0	0	0.22	0
7/23/2023	1	0	0	0.22
7/24/2023	0	0.27	0	0
7/25/2023	0	0.06	0.27	0
7/26/2023	0	0	0.06	0.27
7/27/2023	0	0	0	0.06
7/28/2023	0	0	0	0
7/29/2023	0	0.45	0	0
7/30/2023	0	0.2	0.45	0
7/31/2023	0	0	0.2	0.45
8/1/2023	0	0	0	0.2
8/2/2023	1	0	0	0
8/3/2023	1	0.41	0	0
8/4/2023	0	1.12	0.41	0
8/5/2023	1	0.08	1.12	0.41
8/6/2023	2	0	0.08	1.12
8/7/2023	0	0.78	0	0.08
8/8/2023	0	0.2	0.78	0
8/9/2023	0	0	0.2	0.78
8/10/2023	0	0.19	0	0.2
8/11/2023	0	0.43	0.19	0
8/12/2023	0	0.02	0.43	0.19
8/13/2023	0	0.02	0.02	0.43
8/14/2023	0	0.02	0.02	0.02
8/15/2023	0	0.15	0.02	0.02
8/16/2023	1	0.01	0.15	0.02
8/17/2023	0	0.01	0.01	0.15
8/18/2023	0	0.85	0.01	0.01
8/19/2023	0	0	0.85	0.01
8/20/2023	0	0	0	0.85
8/21/2023	0	0	0	0
8/22/2023	0	0	0	0
8/23/2023	0	0	0	0
8/24/2023	0	0.28	0	0
8/25/2023	1	0.16	0.28	0
8/26/2023	2	0.01	0.16	0.28







Appendix III:

Dr. Alina Vale's Curriculum Vitae

CV of the Author

Alina Vale, DVM, MS, cVMA

Veterinary Experience

Official Veterinarian, California Horse Racing Board. 2019-current. Equine fatality investigations. Chair, Postmortem Review Panel. Pre-race entry screening. Trainer education.

Consultant, Horseracing Integrity & Safety Authority. 2022- current. Support Racetrack Safety Committee develop best practices for tracks to demonstrate compliance with safety regulations; Veterinary records project.

Consultant, British Horse Racing Authority. 2021. Equine Postmortem Study project. 2023 Postmortem Program presentation at the summer Veterinary Officer meeting and staff training to develop a postmortem review program.

Equine Welfare Assessment. 2021-2022. Perform equine welfare assessments at equestrian facilities which include evaluating historical data, tailoring a questionnaire, and conducting a site visit which included observing training. Evaluate horses and the environment to identify potential concerns, educate, and collaborate with owners, trainers, riders, and other stakeholders to provide solutions to improve equine welfare and public perception. Recent projects: AQ Stable, Dubai, UAE. Hipodromo Camarero, Puerto Rico.

Expert Witness, Court of Arbitration for Sport. 2021. Alleged doping and equine abuse case.

Monitoring Veterinarian, Del Mar Thoroughbred Club. 2019. Observe morning training to identify horses not traveling well and provide emergency services. Participate in media interviews to educate the concerned public and meet with government officials to discuss racehorse welfare and safety.

Consultant, FluxErgy. 2018-2021. Provide insight to improve the biotech company's product portfolio, marketing content, and brand awareness for equine veterinary health.

Drug Testing Veterinarian, United States Polo Association. 2018- 2021. Developed a quality, standardized drug testing program to ensure equity, fairness and the appropriate use of therapeutic medications.

Third Party Lasix Administration, Breeder's Cup, Santa Anita Park & Del Mar Thoroughbred Club. 2014- 2019.

Drug Testing Veterinarian, Del Mar Thoroughbred Club, CA, 2010 & 2018 meets- Conducted pre-race TCO2 testing. 2014- Conducted Jockey Club graded stakes out of competition testing.

Hair Sample Collection, Oklahoma Quarter Horse Racing Assoc. 2018. Collected equine hair samples for drug testing.

Endurance Vet, Western US and UAE. 2009 -2018. AERC Certified control judge and treatment vet at endurance rides (including the Tevis Cup, 2010 World Equestrian Games, multi-day events) and Ride and Tie events (Head Vet at 2016 World Championships).

Equine Technical Sales Rep, Ceva Animal Health. Western US. 2014- 2015. Created an equine business unit in 9 states, developed relationships with key accounts, hosted educational meetings and client appreciation events, worked with universities and key opinion leaders, attended conferences, and assisted with marketing strategy.

Associate, von Bluecher, Blea, Hunkin, INC. Los Angeles, CA. 2012- 2013. Worked in a racetrack practice providing routine health care, airway and lameness evaluation, diagnostic imaging, general anesthesia, and emergency services.

Interim Manager/Resident Vet, Emaar Breeding Stable, Dubai, UAE. 2011- 2012. Managed a rapidly expanding 400-horse breeding operation, trained and supervised 28 employees, managed construction and development. Veterinary work included emergencies, routine herd health and foal care, and assisting reproduction veterinarian.

Associate, Dubai Equine Hospital, UAE Oct. 2010-2011. Worked at a stable of 2-year-old Thoroughbreds in training, with racehorses, endurance horses, and traveled abroad with horses.

Intern, Rood and Riddle Equine Hospital, Lexington, KY, 2009-2010. Rotated through the hospital services including internal medicine, lameness and surgery, anesthesia, and emergency duties.

Research Experience

- Page AE, Adam E, Arthur R, Barker V, Franklin F, Friedman R, Grande T, Hardy M, Howard B, Partridge E, Rutledge M, Scollay M, Stewart JC, **Vale A,** Horohov DW. Expression of select mRNA in Thoroughbreds with catastrophic racing injuries. Equine Vet J. 2021 Jan 12. doi: 10.1111/evj.13423. Epub ahead of print. PMID: 33438228.

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- Knych HK, **Vale A**, Wilson WD, Kass PH, Arthur RM, Jones JH. Pharmacokinetics of furosemide administered 4 and 24 hours prior to high-speed exercise in horses. J. vet. Pharmacol. Therap. 2018;41:224-229.
- Knych, H. K., Wilson, W. D., **Vale, A.**, Kass, P. H., Arthur, R. M. and Jones, J. H. (2017), Effectiveness of furosemide in attenuating exercise-induced pulmonary haemorrhage in horses when administered at 4- and 24-h prior to high-speed training. Equine Veterinary Journal.
- Leclere, M., Magdesian, K. G., Cole, C. A., Szabo, N. J., Ruby, R. E., Rhodes, D. M., Edman, J., **Vale, A**., Wilson, W. D., Tell, L. A. (2012) Pharmacokinetics and preliminary safety evaluation of azithromycin in adult horses. J. vet. Pharmacol. Therap. 35, 541–549.

Education

Bachelor's Degree, Veterinary Science, University of California, Davis.

2007

Doctorate of Veterinary Medicine, University of California, Davis.

2009

Medical Acupuncture for Veterinarians, Colorado State University.

2014

Master's Degree, Forensic Veterinary Medicine, University of Florida.

2016

Organizations

American Veterinary Medical Association- Animal Welfare Assessment Contest participant, 2018. Future Leader program, 2017- 2018, Enhanced leadership and communication skills while developing a national Pet Obesity campaign with emphasis on One Health. Participated in networking opportunities, a mentorship program, and speaking engagements including the 2018 Veterinary Leadership Conference and 2018/2019 AVMA Conventions.

2021 Convention Presentation "Can Horseracing in California Survive? Lessons Learned from the CHRB Equine Postmortem Examination Review Program"

2023 Convention Presentation "Sanctioned Horse Racing: The New Rules of Racing"

American Association of Equine Practitioners- Chair of the Welfare & Public Policy Advisory Council. Prior Chair of the Equine Abuse and Neglect subcommittee.

2017 Emerging Leader at the AVMA Veterinary Leadership Conference

2019 Convention: Moderator of Equine Abuse & Neglect Table Topic

2019 Convention Presentation co-author: "Mitigation of 100-mile Fatalities associated with American Endurance Rides (2002-2018)"

2021 Convention Presentation: "How to Develop an Equine Postmortem Examination Review Program"

2023 Round Table panelist: "Social License to Operate: Why does public perception matter for equine sport?"

Association of Racecourse Veterinary Surgeons (Great Britian)

2023 Summer Scientific Meeting Presentations: Postmortem Review Program, Strategy to Reduce Fatalities, Approach to Incidents at California Racetracks

Racing Medication and Testing Consortium RegVet CE

2023 Best Practices- The Racing Regulatory Veterinarian Presentation "Equine Mortality Reviews"

International Veterinary Forensic Science Association

2021-2023 Conference Presentations "Review of the Santa Anita Racetrack Equine Fatality Report", "Sudden Death of Medina Spirit- Postmortem Exam Review", "Equine Abuse & Neglect", "Regulated Racing vs. Unregulated (Match) Racing"

Midwest Veterinary Conference

2022 Conference Presentations (6 hrs) "Equine Abuse & Neglect" for Law Enforcement and Shelter Veterinarians

Ontario Association of Equine Practitioners 2020, Equine Welfare Presentation

Veterinary Information Network 2023, Equine Abuse & Neglect Presentation

American Endurance Ride Conference- served on the Veterinary and Welfare of the Horse Committees. Wrote educational articles in the *Endurance News* magazine and Equine Fatality Reports.

Lecture and mentor pre-vet and veterinary students- Career opportunities, Equine Medicine & Surgery, Acupuncture, Veterinary Forensics, Racehorse Welfare & Safety

Appendix IV:

Summary of Dr. Vale's Report

Expert Report

Alina Vale, DVM, MS

Consultant

Horseracing Integrity & Safety Authority

Saratoga Fatalities Veterinary Review 2023

Veterinary Review

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Introduction

The Horseracing Integrity & Safety Authority (HISA) has accumulated data obtained from equine fatalities at Saratoga Race Course in Saratoga Springs, New York. All horses were submitted to the Cornell University Animal Health Diagnostic Center for necropsy (an animal autopsy, or postmortem examination).

Instructions

I have been instructed by Dr. Jennifer Durenberger, HISA's Director of Equine Safety and Welfare to review information provided by the New York Racing Association (NYRA) and HISA regarding each fatality at Saratoga during the Summer 2023 race meet. I have been provided with documents from 14 equine fatality cases, including 2 sudden deaths and 12 musculoskeletal cases. Documents included necropsy reports, death certificates, pre-race inspection records, race charts, past performance information, workout histories, and medical records entered into the HISA electronic portal.

Postmortem Examination Review #1: Frigid Lady

Horse Information: 3-year-old Thoroughbred filly, Microchip # 982020033601321, Trainer: Michael J. Maker

On August 13, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly met with the trainer. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On July 15, 2023 Frigid Lady performed a 5-furlong timed workout during morning training on the dirt track. The track was listed as fast. The horse clocked 1:03 and was pulled up after passing the wire, near the 1-mile pole, with a right forelimb injury. The horse was transported by ambulance off the track and radiographed by an attending veterinarian prior to euthanasia. Blood and hair samples were collected for drug testing.

Necropsy Summary:

A necropsy examination revealed biaxial proximal sesamoid bone fractures (basilar) in the right forelimb.

Additional findings included (Grade 1) palmar osteochondral disease of the forelimb distal cannon bones and third carpal bone sclerosis (more severe in the right forelimb).

Racing/Training History:

This horse ran 11 lifetime races. The horse was claimed by the final trainer 9/18/22, in the horse's 4th race. The trainer described the horse as having upright pastern conformation and an aggressive behavior during training, "wanting to do more". This eagerness was managed with the most experienced exercise rider in the barn. The horse did not run as well as expected during the race 5/11/23 at Churchill Downs. The horse won a race 6/1/23, then worked back 7/4/23 (34 days to work back from the race) and shipped to Saratoga.

Conclusion:

This horse sustained biaxial proximal sesamoid bone fractures during a timed workout.

Postmortem Examination Review #2: Winter Son

Horse Information: 4-year-old Thoroughbred gelding, Microchip # 981020033097757, Trainer: Marcelo Arenas

On August 28, 2023 NYRA's Dr. Don Baker and safety steward Julie Kagno met with the trainer. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On July 20, 2023 Winter Son was performing a 5 furlong workout on the dirt track during morning training. The track was rated as fast. At the 1/8th pole the horse sustained an injury. The horse was transported by ambulance off the track and euthanized by an attending veterinarian. Blood and hair samples were collected for drug testing.

Necropsy Summary:

A necropsy examination revealed an open, comminuted lateral condylar fracture of the third metacarpal (cannon) bone, and proximal sesamoid bone fractures with rupture of the intersesamoidian ligament in the right forelimb. Additional findings included third carpal bone sclerosis and erosion of the radial facet in the left forelimb.

Racing/Training History:

This horse ran 15 lifetime races and was claimed from the initial trainer on 4/10/22. The horse had a layoff between races 7/14/22 and 3/4/23 then raced 4/20/23, 6/9/23 and 7/2/23. The final timed works were 4/8/23, 5/18/23, 5/24/23 and 6/1/23. The trainer reported giving the horse several weeks of recovery time after each race because the horse would lose weight and have a poor appetite after racing. The trainer reported the horse developed an issue in the left hindlimb in October 2022, and was treated at an equine hospital. The trainer reported the horse developed a bruised hoof in March 2023 and was shod in ¾ shoes since then.

Conclusion:

This horse sustained an open lateral condylar fracture and biaxial proximal sesamoid bone fractures during a timed workout.

Postmortem Examination Review #3: Blame It On Mary

Horse Information: 5-year-old Thoroughbred mare, Microchip # 981020023679454, Trainer: Edward R. Barker

On August 31, 2023 NYRA's Drs. Don Baker and Martha Misheff, and New York State Gaming Commission (NYSGC) Equine Medical Director Dr. Scott Palmer met with the trainer. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On July 23, 2023 Blame It On Mary ran in race 3, a 5 ½ furlong Allowance Optional Claiming race on the Inner Turf with a purse of $100,000. The weather was clear, and the turf was listed as firm. The horse broke from post position 6 at 2:27 P.M., and was in the lead until sustaining an injury near the 7/16ths pole and being pulled up near the 5/16ths pole. The horse was transported by ambulance off the track and radiographed by an attending veterinarian prior to euthanasia. Blood and hair samples were collected for drug testing. The trainer noted that there had been rainfall in the days leading up to the race, and racing on the turf continued, leading to divots in the turf. Dr. Baker reported 2.5 inches of rain over the 4 days preceding the race.

Necropsy Summary:

A necropsy examination revealed biaxial sesamoid bone fractures (apical fracture in the medial sesamoid and basilar fracture in the lateral sesamoid) in the left forelimb. Additional findings included third carpal bone sclerosis, palmar osteochondral disease in the lateral condyle of the third metacarpus, and a bone bruise of the midsagittal ridge in the left forelimb, and erosion at the distal end of the radius in the right carpus. The lateral and medial heels had been removed from both front shoes.

Racing/Training History:

This horse ran 23 lifetime races with a layoff between races 11/10/22 and 5/29/23. The horse did not work back from the 5/29/23 race until 6/25/23 then worked 7/8/23 and 7/17/23. The trainer reported the horse was a turf horse and thus he opted to give the horse the winter off in Ocala, and the horse returned to training early March 2023. The trainer noted the horse put a lot of effort into races thus the extra time returning to timed workouts. The trainer did utilize "2-minute licks." The trainer did not want to overtrain nor over-race the horse, and noted the horse did best with 60 days between races. The trainer reported utilizing ½ shoes (tip shoes) for 1 year to eliminate heel pressure and prevent the horse from interfering (the front limbs hitting each other).

Conclusion:

This horse sustained biaxial proximal sesamoid bone fractures while racing on the turf.

Postmortem Examination Review #4: Lawful

Horse Information: 3-year-old Thoroughbred colt, Microchip # 981020033561285 (not confirmed in necropsy gross description- blaze, stocking hind limbs and right front), Trainer: David Jacobson

On September 11, 2023 NYRA's Dr. Don Baker and safety stewards Julie Kagno and Tim Kelly met with the trainer. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On August 2, 2023 Lawful performed a 3 furlong workout in :39.2 on the dirt track during morning training. The dirt was listed as fast and the weather report noted patches of fog. The horse was observed to be lame by a NYRA veterinarian while walking to the barn area. Drug testing samples were not collected. The trainer reported standing the horse in ice and the horse was able to bear weight normally on the limb and was eating hay in the stall. The attending veterinarian administered phenylbutazone and arranged for another veterinarian to radiograph the limb later in the day. Euthanasia was recommended after the radiographs were obtained.

Necropsy Summary:

A necropsy examination revealed biaxial proximal sesamoid bone fractures in the left forelimb.

Racing/Training History:

This horse ran 7 lifetime races, beginning mid-December of the 2-year-old year. The horse ran monthly except for May 2023 with the final races 6/15/23 and 7/9/23. The final works were 7/1/23, 7/5/23, 7/24/23 and 8/2/23. The final trainer purchased the horse at the Keeneland Selected Horses of Racing Age Sale on 4/30/23. The trainer reported that there were no abnormal findings on the horse's radiographs at the sale. The trainer noted the horse jogged 'green' or clumsy in hand and the trainer was slightly disappointed in the horse's performance in the final race. The trainer believed the horse was ready to run again, but needed more distance. The trainer explained that he breezed the horse slow by intent, and would sometimes breeze every 3 or 4 days.

Conclusion:

This horse performed a timed workout during morning training and was noted to be lame walking to the barn area. The horse was able to bear weight on the limb. Later in the day radiographs revealed the horse had sustained biaxial sesamoid bone fractures.

Postmortem Examination Review #5: Sopran Basilea (IRE)

Horse Information: 5-year-old Thoroughbred mare, Microchip # 985101045307737 (not confirmed in necropsy gross description- chestnut, star), Trainer: H. Graham Motion

On October 16, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting.

Incident Summary:

On August 3, 2023 Sopran Basilea (IRE) ran in race 9, a 1 ½ miles grade 2 stakes race on the Inner Turf with a purse of $250,000. The weather was clear, and the turf was listed as firm. The race was off at 5:45 P.M. The horse finished 4th, and was injured and pulled up past the wire. The horse was euthanized on the track by a regulatory veterinarian. Blood and hair samples were collected for drug testing. The horse was insured. The trainer noted Saratoga had an irregular season with regard to rainfall, and suggested that the turf never got to recover and completely dry out. Dr. Baker reported .34 inches of rain on 7/28/23 and .29 inches on 7/30/23.

Necropsy Summary:

A necropsy examination revealed an open, articular, comminuted proximal phalanx (P1) fracture, and distal sesamoidean and suspensory ligament ruptures in the right forelimb. The necropsy report lacked sufficient detail to distinguish if the clinically appreciated lateral sesamoid bone fracture was present.

Racing/Training History:

This horse ran 18 lifetime races. The horse did not race as a 2-year-old. The horse raced abroad through 10/30/22 then had a layoff over the winter. The horse began timed workouts in the United States in March 2023 and racing began in the U.S. 5/20/23 at Pimlico Race Course. The horse won the Robert G. Dick Memorial Stakes Race 7/1/23 at Delaware Park then worked back 7/21/23. The horse worked 7/29/23. The trainer shared that it was standard in his barn to wait 3 weeks to work back after a race.

Conclusion:

This horse sustained an open, comminuted P1 fracture, and distal sesamoidean and suspensory ligament ruptures galloping out after a race.

Postmortem Examination Review #6: Maple Leaf Mel

Horse Information: 3-year-old Thoroughbred filly, Microchip # 981020033591464 (not confirmed in necropsy gross description- roan, star with connected stripe, white coronet left front), Trainer: Melanie Giddings

On October 13, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting. On October 20, 2023 Dr. Vale met with the trainer via Zoom to review the necropsy findings in further detail.

Incident Summary:

On August 5, 2023 Maple Leaf Mel ran in race 8, "The Test" Stakes race at 7 furlongs on the dirt track with a purse of $500,000. The weather was clear, and the track was listed as fast. The horse broke from post position 8 at 4:29 P.M. and was in the lead until sustaining an injury and falling just before the finish line. The horse stood with an open injury in the right forelimb. The horse was evaluated and euthanized on the track by a regulatory veterinarian. Blood and hair samples were collected for drug testing. The horse was insured. The jockey was unseated during the fall and was taken by ambulance to an Albany hospital trauma center. He was reported to have been treated for minor injuries and returned to riding races 8/10/23.

Necropsy Summary:

A necropsy examination reported an open fetlock joint disarticulation in the right forelimb, with suspensory ligament rupture biaxially at the level of the sesamoid bones. The necropsy report lacked sufficient detail to distinguish if the clinically appreciated biaxial sesamoid bone fractures were present. Photos provided by the pathologist revealed a displaced lateral condylar fracture.

Racing/Training History:

This horse had 6 lifetime starts and won the first 5 races (8/10/22, 8/26/22, 3/24/23, 5/19/23 and 7/8/23). After the second race, the trainer noted the horse was not traveling as 'fluid' as previously. Radiographs were obtained for minor shin soreness and the horse was turned out at a farm. The horse returned to timed workouts 1/6/23. The horse was originally trained by Jeremiah Englehart, with the final trainer working as the assistant trainer. The assistant trainer became a trainer and was the trainer of record for the final two races. The horse worked back from the penultimate race on 7/21/23 then worked 7/28/23. The trainer shared that waiting two weeks to work back from a race was standard for her barn. For morning training, the trainer preferred the surface of the training track over the main dirt track at Saratoga.

Conclusion:

This horse sustained an open fetlock luxation with a lateral condylar fracture and suspensory apparatus failure at the level of the sesamoid bones at the end of a race.

Postmortem Examination Review #7: Closed Caption

Horse Information: 3-year-old Thoroughbred filly, Microchip # 981020035738653 (not confirmed in necropsy gross description- chestnut, star with connected stripe, white half-sock left front), Trainer: Kenneth G. McPeek

On September 25, 2023 NYRA's Dr. Don Baker met with the trainer. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On August 6, 2023 Closed Caption was performing a 3-furlong workout on the dirt track during morning training. The track was listed as fast. The horse finished the work in 37 seconds and pulled up near the 5/8ths pole during the gallop out. The horse was transported by ambulance off the track and treated and radiographed by an attending veterinarian prior to euthanasia. Blood and hair samples were collected for drug testing. The trainer traveled over the track surface to reach the injured horse and noted the dirt was 6-8 inches deep, which he felt was too deep. The trainer reported there was unusually heavy rain prior to the day of injury. After the injury the trainer recommended the track have two morning breaks for track maintenance to freshen the track for horses to perform timed workouts. The trainer was pleased with the response to this request.

Necropsy Summary:

The necropsy report was consistent with the clinical history of left forelimb biaxial proximal sesamoid bone fracture. In the signalment section, the gender is reported as Male, however it is correctly reported as filly in the gross description.

Racing/Training History:

This horse ran 3 lifetime races between 9/10/22 and 10/9/22 then had a layoff. The trainer reported that the layoff was due to a tibial stress fracture, and that the horse had shins (dorsal metacarpal disease) which were pinfired earlier in the 2-year-old year. The trainer shared that the filly was small with 'back at the knee' limb conformation. The horse returned to timed workouts in January then was scratched the morning of a race at Keeneland on 4/7/23 and placed on the veterinarian's list as unsound. This was the horse's second timed work since returning from layoff.

Conclusion:

This horse sustained biaxial sesamoid bone fractures galloping out after a workout. The filly was still on the veterinarian's list as unsound at the time of the injury.

Postmortem Examination Review #8: Ever Summer

Horse Information: 4-year-old Thoroughbred filly, Microchip # 981020031356504 (not confirmed in necropsy gross description- bay, star), Trainer: Christophe Clement

On December 18, 2023, Drs. Jennifer Durenberger and Alina Vale spoke with the trainer via phone call.

Incident Summary:

On August 6, 2023 Ever Summer ran in race 4, a 1 3/8th miles Allowance Optional Claiming race on the Inner Turf with a purse of $156,000. The weather was clear, and the turf was rated as good. The race was off at 2:54 P.M. The horse was injured and fell near the ¼ pole. The horse was euthanized by a regulatory veterinarian on the track. Blood and hair samples were collected for drug testing. The horse was insured.

The trainer noted that the turf was soft, but that if he had been concerned about the condition, he would have scratched out of the race.

Necropsy Summary:

A necropsy examination revealed an open left forelimb fetlock disarticulation with lateral condylar fracture. The report noted complete rupture of the suspensory ligament, biaxially, at the level of the sesamoid bones.

The necropsy narrative contained insufficient detail to confirm the clinical appreciated biaxial sesamoid bone fractures. Photos provided by the pathologist appeared to be in accordance with the clinically appreciated biaxial sesamoid bone fractures. In the signalment section, the gender is reported as Male, however it is correctly reported as filly in the gross description.

Racing/Training History:

This horse ran 9 lifetime races with a layoff after the second race in December 2021. The filly returned to racing in August 2022 and on 11/18/22, the filly was involved in an interference incident in a race at Aqueduct. The trainer reported the filly clipped heels and fell and was given time off to recover. The filly returned to training in March 2023. In the most recent race, the filly placed 2nd in the Robert G. Dick Memorial Stakes Race 7/1/23 at Delaware Park. The horse worked back 7/15/23 then worked 7/23/23 and 8/1/23.

Conclusion:

This horse sustained an open fetlock luxation with lateral condylar fracture and suspensory apparatus failure at the level of the sesamoid bones while racing.

Postmortem Examination Review #9: Wisecraken

Horse Information: 3-year-old Thoroughbred gelding, Microchip # 981020033776785, Trainer: Michelle Nevin

On August 29, 2023 NYRA's Dr. Don Baker met with the trainer and assistant Tommy Singh. Dr. Alina Vale joined via Teams Meeting.

Incident Summary:

On August 16, 2023 Wisecraken ran in race 5, a 1 1/8th miles Starter Allowance race on the Inner Turf course with a purse of $70,000. The weather was cloudy, and the turf was listed as good. The race was off at 3:28 P.M. and the horse was hustled from the gate then showed the way on the inside with company to the outside. The horse was asked on the far turn and was injured near the 5/16ths pole. The horse was transported by ambulance off the track and treated by an attending veterinarian prior to euthanasia. Blood and hair samples were collected for drug testing. The horse was insured. The trainer reported extreme rain in the days leading up to the race, and noted a soft turf can be a tiring surface. Dr. Baker reported 1.3 inches of rain over the previous 5 days and light rain on the day of the race.

Necropsy Summary:

A necropsy examination revealed an open lateral condylar fracture of the third metatarsal (cannon) bone in the right hindlimb. The necropsy report lacked sufficient detail to confirm the clinically appreciated biaxial sesamoid bone fractures.

Racing/Training History:

This horse ran 5 lifetime races with a layoff from racing 12/1/22 until a win 7/2/23. The trainer opted to give the horse the winter off because of his large size and she usually rested her turf horses during the winter instead of shipping them to Florida. The trainer shared that the horse had a 'lazy type' personality and took time to show his ability.

Conclusion:

This horse sustained an open lateral condylar fracture in a hind limb while racing.

Postmortem Examination Review #10: Burning Bright

Horse Information: 6-year-old Thoroughbred gelding, Microchip # 981020021862490, Trainer: Norm W. Casse

On November 28, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting.

Incident Summary:

On August 23, 2023 Burning Bright ran in race 7, a 1 5/8th miles Stakes race on the Mellon Turf course with a purse of $135,000. The weather was clear, and the turf was rated as firm. The race was off at 4:36 P.M. and the horse bumped another horse at the start. The horse lost action near the 7/8ths pole and the jockey attempted to pull the horse up. The horse went through the inside rail and hedge then collapsed and died. Blood and hair samples were collected for drug testing. The trainer shared that the horse did not appear comfortable during the race prior to collapse, and did not show early speed as was expected.

Necropsy Summary:

A necropsy examination revealed aortic rupture, with a defect and thinning of the blood vessel at the level of the ascending aorta. There was extensive bleeding around and within the lungs. Blood around the heart could have caused cardiac tamponade (pressure around the heart) and subsequent cardiac arrest. Bleeding in the muscles along the horse's side was likely due to trauma during the cardiovascular event. A hematoma along the left side of the neck was deemed incidental.

Racing/Training History:

This horse did not race as a 2-year-old. The horse had 15 lifetime starts and was claimed from the initial trainer 10/20/22. The horse's last completed races were 5/5/23 and 7/2/23 and the final works were 7/17/23, 7/25/23, 8/3/23 and 8/13/23. The trainer shared that the horse trained well at Fairgrounds over the winter, then appeared lethargic at Ellis Park. The trainer believed that the horse was not doing well in the heat and moved the horse to Saratoga for the cooler weather. The horse appeared to respond well after the move.

Conclusion:

This horse collapsed and died while racing. The postmortem examination revealed aortic rupture.

Postmortem Examination Review #11: Nobel (IRE)

Horse Information: 4-year-old Thoroughbred colt, Microchip # 985105045327490 (not confirmed in necropsy gross description- liver chestnut, star, white sock left hind), Trainer: Brendan P. Walsh

On October 10, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting.

Incident Summary:

On August 26, 2023 Nobel (IRE) ran in race 5, a 1 3/16th miles Allowance Optional Claiming race on the Mellon Turf with a purse of $156,000. The weather was clear, and the turf was rated as good. The race was off at 1:57 P.M. and the horse finished 5th then was injured galloping out. The horse and jockey fell and the horse was caught. The horse was euthanized on the track by a regulatory veterinarian. Blood and hair samples were collected for drug testing. The horse was insured. The trainer noted Saratoga had experienced a lot of rain and expressed concern that the hedge around the turf course could shelter part of the track from drying out and create an inconsistent surface with some false patches of ground. The trainer noted the hedge near the area of injury and wondered if this was a contributing factor to the injury (as the rail was set at 0 feet). Dr. Baker reported 2.78 inches of rain in the 7 days preceding the race had with a ½ inch of rain the day before the race.

Necropsy Summary:

A necropsy examination revealed an open left forelimb fetlock disarticulation with lateral condylar fracture, comminuted medial proximal sesamoid bone avulsion fracture, and comminuted spiral fracture of the first phalanx (P1).

Racing/Training History:

This horse had 7 lifetime starts with the first 6 races in England. The horse was imported to the United States in early August and had one timed workout at Saratoga on 8/20/23. The final trainer reported that the owner had moved several horses to the U.S. from overseas. The horse had been entered to run at Saratoga 8/18/23, however, the race was moved off the turf and the horse was scratched.

Conclusion:

This horse sustained a complex fetlock injury galloping out after a race on the turf.

Postmortem Examination Review #12: New York Thunder

Horse Information: 3-year-old Thoroughbred colt, Microchip # 981020035758325 (not confirmed in necropsy gross description- dark bay), Trainer: Jorge Delgado

On November 18, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting.

Incident Summary:

On August 26, 2023 New York Thunder ran in race 9, a 7 furlong Stakes race on the dirt track with a purse of $500,000. The weather was clear, and the dirt was rated as muddy (sealed). The race was off at 4:22 P.M. and the horse was in the lead until sustaining an injury near the 1/16th pole. The horse fell then stood with an open injury in the left forelimb and ran loose. The horse was caught near the finish line and was euthanized on the track by a regulatory veterinarian. Blood and hair samples were collected for drug testing. The horse was insured. Dr. Baker reported that it had rained .48 inch in the preceding 24 hrs. The rider took off his mounts the next day and returned to riding 8/30/2023.

Necropsy Summary:

A necropsy examination revealed an open, comminuted mid-diaphyseal (midshaft) fracture of the left third metacarpal (cannon bone).

Racing/Training History:

This horse had 5 lifetime starts and won the first 4 races. The trainer reported that the horse entered his barn in October 2022 after having been broke (started under saddle) in Ireland, and had not shown a lot of talent. The trainer noted the forelimbs were set wide, and was later told by the breeder that the horse had been small and weak as a foal. The horse's first race was 11/27/22, and the second was 12/30/22 and the horse sustained a scrape to the front of the right front fetlock. On 3/25/23 the horse was lame and scratched from a race at Keeneland after a stall injury to the right radius developed into a draining abscess. The horse worked for and was cleared by a regulatory veterinarian in early April. On 4/16/23 the horse was scratched from a race at Keeneland by the trainer, then raced 4/30/23 at Woodbine in a stakes race. On 6/7/23 the horse pulled the left front shoe during morning training and a slight left front lameness was noted until the shoe was replaced. A regulatory veterinarian inspected the horse at this time and prior to shipping to Belmont. On 6/10/23 the horse was a veterinary scratch at Belmont as injured for a sore left front hoof. On 7/2/23 the horse was scratched from a race at Ellis Park. The trainer explained that there was concern about how the horse would perform on the dirt surface after a storm, and the owner preferred to wait for a larger stakes race to make the horse more valuable. The horse raced in the Amsterdam Stakes (G2) at Saratoga on 7/28/23, earning a 108 speed figure, then worked 8/12/23 and 8/19/23.

Conclusion:

This horse sustained a mid-cannon bone fracture while racing.

Postmortem Examination Review #13: La Aguililla

Horse Information: 7-year-old Thoroughbred mare, Microchip # 98111001106210 (not confirmed in necropsy gross description- star, socks right front and right hind), Trainer: David Jacobson

Incident Summary:

On August 25, 2023 La Aguililla ran in race 2, a 7 furlong Claiming race on the dirt track with a claiming price of $16,000. The dirt was rated as muddy. The horse finished the race and pulled up with a left forelimb injury just past the wire. Blood samples were collected; however, hair samples were not collected at the time of injury, as the injury was not believed to be fatal. The horse was treated, stabilized, and transported by ambulance off the track. Radiographic examination revealed distally displaced proximal sesamoid bones.

The horse was managed medically until transported to a referral clinic for further evaluation on 9/1/23. At the clinic, ultrasound examination showed a large hypoechoic region at the origin of the left front suspensory ligament (avulsion at insertion). Fetlock arthrodesis surgery was declined. On 9/12/23, the mare showed clinical signs consistent with laminitis in the right forelimb. The mare was euthanized for poor prognosis on 9/13/23.

Necropsy Summary:

A necropsy examination reported laminitis in the left [sic] forelimb, inflammation of the right [sic] forelimb suspensory ligament and deep digital flexor tendon, front fetlock synovitis/arthritis, trauma to the left forelimb fetlock with a wound at the back, and bleeding from the glandular portion of the stomach.

Racing/Training History:

This horse had 39 lifetime starts with 9 races in 2023. The first race with her final trainer was 4/28/23. She raced again on 6/23/23, 7/13/23, 8/2/23, and 8/25/23. Her final works were 6/12/23, 7/31/23, and 8/21/23.

Conclusion:

This horse sustained a suspensory ligament injury while racing on a muddy surface. Conservative management was attempted; however, the horse was ultimately euthanized.

Postmortem Examination Review #14: Shutters

Horse Information: 5-year-old Thoroughbred gelding, Microchip # 981020025187357 (not confirmed in necropsy gross description- star, hind socks), Trainer: Mark Hennig

On December 6, 2023 NYRA's Dr. Don Baker and safety steward Tim Kelly, and Dr. Alina Vale met with the trainer via Teams Meeting.

Incident Summary:

On August 29, 2023 Shutters was in the barn stall and was heard to be struggling in the early afternoon. The horse was found recumbent, displaying seizure-like activity, and died before the attending veterinarian could perform treatment. The horse was insured. Postmortem blood and hair samples were collected for drug testing.

Necropsy Summary:

A necropsy examination did not reveal the cause of death. Findings included blood in the pericardial sac (space around the heart), pulmonary hemorrhage (bleeding in the lungs) and congestion, and cerebrum/cerebellum (brain) congestion on histology (microscopic examination). Toxicologic testing of liver tissue for anticoagulant rodenticides revealed low diphacinone exposure, detected below the limit of quantification (30ppb). There was a hematoma over the left jugular vein and pinpoint penetration associated injury of the carotid artery, which could have been associated with postmortem blood sample collection for drug testing. The left iliopsoas muscle had subacute hemorrhage, which was presumptively secondary to the presumed seizure and may have been exacerbated by a presumed coagulopathy.

Racing/Training History:

This horse ran 7 lifetime races with 3 in 2023. The horse raced 9/15/23 then had a layoff, returned to timed works 1/20/23 and returned to racing 4/7/23. Her final races were 6/17/23 and 8/5/23. Her final works were 6/10/23, 7/6/23, 7/20/23, 7/28/23 and 8/24/23. The attending veterinarian performed a pre-entry exam the morning of the incident, as the horse was to be entered the following day for a race that weekend. No abnormalities were noted at the time of the exam.

Conclusion:

This horse died in the stall. The postmortem examination did not reveal the cause of death. A presumed coagulopathy (bleeding disorder) was supported by bleeding throughout the body including around the heart. A low level of anticoagulant rodenticide exposure was detected in liver tissue; however, the significance is unknown.

Appendix V:

Dr. Susan Stover's Curriculum Vitae

SUSAN M STOVER, DVM PhD DiplACVS
Distinguished Professor Emeritus, Department of Surgical and Radiological Sciences
University of California, Davis, CA 95616

Current and Previous Positions

2023-present	Distinguished Professor Emeritus, JD Wheat Veterinary Orthopedic Research Laboratory, VM:Surgical and Radiological Sciences, University of California, Davis, Davis, CA
2019-2023	Distinguished Professor and Director, JD Wheat Veterinary Orthopedic Research Laboratory, VM:SRS, University of California, Davis, Davis, CA
2017-2019	Distinguished Professor and Director, JD Wheat Veterinary Orthopedic Research Laboratory, VM:APC, University of California, Davis, Davis, CA
1998-2017	Professor and Director, JD Wheat Veterinary Orthopedic Research Laboratory, VM:APC, University of California, Davis, Davis, CA
1994-1998	Associate Professor, VM:APC, University of California, Davis, Davis, CA
1987-1994	Assistant Professor, Dept. Anatomy, Physiology & Cell Biology (VM:APC), School of Veterinary Medicine, University of California, Davis, Davis, CA
1980-1983	Visiting Lecturer (Equine Surgeon), Department of Surgery, School of Veterinary Medicine, University of California, Davis, Davis, CA
1979-1980	Veterinarian, Central Washington Equine and Livestock Clinic, Yakima, WA

Educational Background

Washington State University, Pullman, WA	BS	1974	Veterinary Science
Washington State University, Pullman, WA	DVM	1976	Veterinary Medicine
University of California, Davis, CA	Internship	1976-1977	Equine Surgery
University of California, Davis, CA	Residency	1977-1979	Equine Surgery
American College of Veterinary Surgeons	Diplomate	1986	Veterinary Surgery
University of California, Davis, CA	PhD	1987	Comparative Pathology

Short Summary

Dr. Stover is a Distinguished Professor Emeritus at the University of California at Davis. She received her veterinary degree from Washington State University, and subsequently completed an Equine Surgery Internship and Residency at University of California at Davis. She was in equine practice in Washington State before returning to the Veterinary Medical Teaching Hospital, UC Davis to teach clinical equine lameness and surgery to veterinary students and residents. She became board certified by the American College of Veterinary Surgeons while pursuing a PhD program focused on equine orthopedic research (Dorsal metacarpal disease ('bucked shins') in Thoroughbred racehorses). She now devotes her time to equine orthopedic research, with over 200 research publications.

Her major research focuses are the biomechanics and prevention of musculoskeletal injuries in equine athletes and treatment of orthopedic disorders in domestic and non-domestic animals. Her key contributions to the safety and welfare of horses include discovery and detection of lesions that predispose to catastrophic injuries in racehorses and elucidation of factors that contribute to injury development in racehorses and sport horses. Current research efforts are focused on understanding how training and injury affect bone adaptation or propensity for bone fracture and the effects of arena surface materials and shoes on hoof and fetlock biomechanics and thus propensity for injury in athletes.

Honors

1976 Large Animal Surgery Clinics Award, College of Veterinary Medicine, Washington State University
1983 Clinical Faculty Teaching Award, School of Veterinary Medicine, University of California, Davis

1986 Autotutorial Excellence SCAVMA National Symposium Videotape - "Surgical Removal of One Conceptus from the Mare with a Twin Pregnancy"
1996 Norden Distinguished Teaching Award for the School of Veterinary Medicine, Univ California, Davis
1997 Bayer Excellence in Equine Research Award, American Veterinary Medical Association Council on Research
2005 Chancellor's Distinguished Lectureship Series, Louisiana State University, "Clues to the genesis of musculoskeletal injuries from Thoroughbred racehorses"
2007 Faculty Research Award, School of Veterinary Medicine, University of California, Davis
2007 American Horse Publications Award, 3rd place, "Suspensory Ligament Injuries in Horses", co-author
2008 Outstanding Women in Racing
2010 Distinguished Veterinary Alumnus Award for Excellence in Teaching and Research, Washington State University
2013 Alumni Achievement Award, School of Veterinary Medicine, University of California, Davis
2014 American College of Veterinary Surgeons Foundation Award for Career Achievement
2016 American Veterinary Medical Association Lifetime Excellence in Research Award
2016 University of Kentucky Equine Research Hall of Fame Inductee
2018 International Equine Veterinarian Hall of Fame Inductee, American Farriers Journal
2019 John Hickman Memorial Lecture, British Equine Veterinary Association
2022 Frank J. Milne State-of-the-Art Lecture, American Association of Equine Practitioners

Racehorse and Sport Surface Related Publications (from over 200 publications)

1992 Stover SM, Johnson BJ, Daft BM, Read DH, Anderson M, Barr BC, Kinde H, Moore J, Stoltz J, Ardans AA. An association between complete and incomplete stress fractures of the humerus in racehorses. Equine Veterinary Journal, 24(4): 260-3.
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1995 Estberg L, Gardner IA, Stover SM, Johnson BJ, Case JT, Ardans A. Cumulative racing-speed exercise distance cluster as a risk factor for fatal musculoskeletal injury in Thoroughbred racehorses in California. Preventive Veterinary Medicine, 24: 253-63.
1996 Estberg L, Stover SM, Gardner IA, Johnson BJ, Case JT, Ardans A, Read DH, Anderson ML, Barr BC, Daft BM, Kinde H, Moore J, Stoltz J, Woods LW. Fatal musculoskeletal injuries incurred during racing and training in thoroughbreds. Journal of the American Veterinary Medical Association, 208(1): 92-6.
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characteristics as possible risk factors for fatal musculoskeletal injury of thoroughbred racehorses. American Journal of Veterinary Research, 57(8): 1147-52.
1996 Hornof WJ, Stover SM, Koblik PD, Arthur RM. Oblique views of the ilium and the scintigraphic appearance of stress fractures of the ilium. Equine Veterinary Journal, 28(5): 355-8.
1996 Martin RB, Stover SM, Gibson VA, Gibeling JC, Griffin LV. In vitro fatigue behavior of the equine third metacarpus: remodeling and microcrack damage analysis. Journal of Orthopedic Research, 14(5): 794-801.
1996 Estberg L, Stover SM, Gardner IA, Drake CM, Johnson B, Ardans A. High-speed exercise history and catastrophic racing fracture in thoroughbreds. American Journal of Veterinary Research, 57(11): 1549-55.
1996 Martin RB, Lau ST, Mathews PV, Gibson VA, Stover SM. Collagen fiber organization is related to mechanical properties and remodeling in equine bone. A comparison of two methods. Journal of Biomechanics, 29(12): 1515-21.
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1997 Griffin LV, Gibeling JC, Gibson VA, Martin RB, Stover SM. Artifactual nonlinearity due to wear grooves and friction in four-point bending experiments of cortical bone. Journal of Biomechanics, 30(2): 185-8.
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1998 Estberg L, Gardner IA, Stover SM, Johnson BJ. A case-crossover study of intensive racing and training schedules and risk of catastrophic musculoskeletal injury and lay-up in California thoroughbred racehorses. Preventative Veterinary Medicine, 33(1-4): 159-70.
1998 Les CM, Stover SM, Taylor KT, Keyak JH, Willits NH. Ex vivo simulation of in vivo strain distributions in the equine metacarpus. Equine Veterinary Journal, 30(3): 260-6.
1998 Carrier TK, Estberg L, Stover SM, Gardner IA, Johnson BJ, Read DH, Ardans AA. Association between long periods without high-speed workouts and risk of complete humeral or pelvic fracture in thoroughbred racehorses: 54 cases (1991-1994). Journal of the American Veterinary Medical Association, 212(10): 1582-7.
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Appendix VI:

Dr. Stover's Analysis

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

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smstover@ucdavis.edu

September 25, 2023

RE: Saratoga Exercise History Summary

The lifetime high-speed exercise history (official timed works and races) of 12 horses that died or were euthanized at Saratoga racetrack because of a musculoskeletal injury were examined. NOTE that 1) the exercise histories of 2 horses (IRE) had races in either England and/or Australia without officially recorded timed workouts during the overseas racing period, and 2) small sample sizes may not represent the larger population of racehorses.

One horse that died of sudden death was not included in the analysis. The exercise histories of injured (case) horses were compared with 3 control horses per injured horse, matched by participating in the last event (official timed work or race) of the injured horse. Exercise histories for control horses are truncated to the date of death of the injured horse. Thus, injured horses (Cases) are similar in age, sex, and quality to Control horses.

The exercise histories were reduced to 65 variables. Univariate conditional logistic regression was used to find variables that may be different between injured and control horses. Two variables became apparent that are likely different between injured and control horses (p=0.04-0.08). Injured (case) horses had more races per year during actively racing periods (i.e., periods without a layup >60 days) and on average more furlongs in races per month when actively racing than control horses. Adjusted for the difference in mean values between injured and control horses, based on number of races averaged over one year for periods of active racing, the injured horses were 2.5 times more likely to be injured than control horses. Details can be found in the Appendix.

In summary – there are horse level risk factors that likely contributed to risk for injury. The factors observed are consistent with our knowledge of repetitive, overuse (fatigue) injuries in racehorses. Frequent high intensity exercise (as observed in injured horses) that does not allow for recovery of exercise-induced microdamage contributes to the development of stress fractures and subchondral stress remodeling which predispose horses to catastrophic injuries.

Happy to have a conversation – and provide detailed data.

Sincerely,

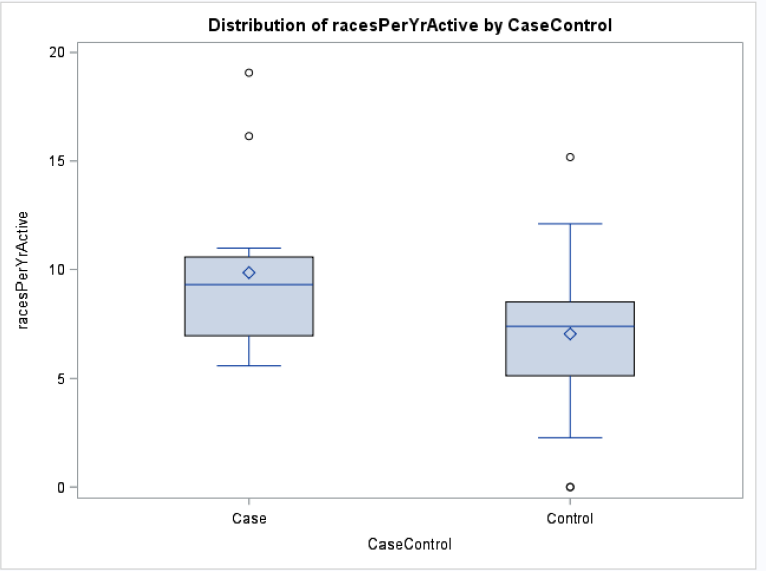
Susan M. Stover, DVM, PhD, Dipl ACVS
Distinguished Professor Emeritus
Director, JD Wheat Veterinary Orthopedic Research Laboratory

Appendix

Races per year when active – p=0.04

Control 7.1 ± 3.2 (6.0, 8.1) [mean ± SD, 95% confidence level]

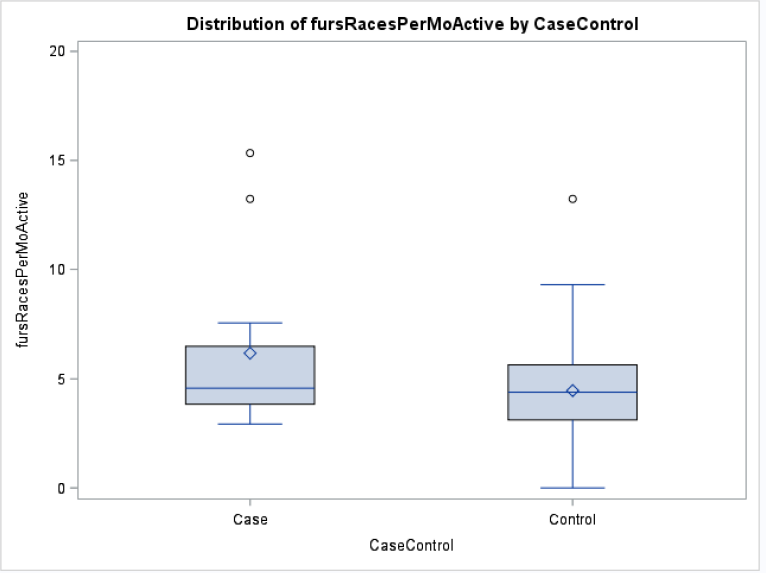
Case 9.9 ± 4.0 (7.3, 12.4)



Furlongs in Races per Month when Active – p=0.077

Control 4.5 ± 2.5 (3.6, 5.3) [mean ± SD, 95% confidence level]

Case 6.2 ± 4.0 (3.6, 8.7)



Exercise History Report (Full)
Blame It On Mary

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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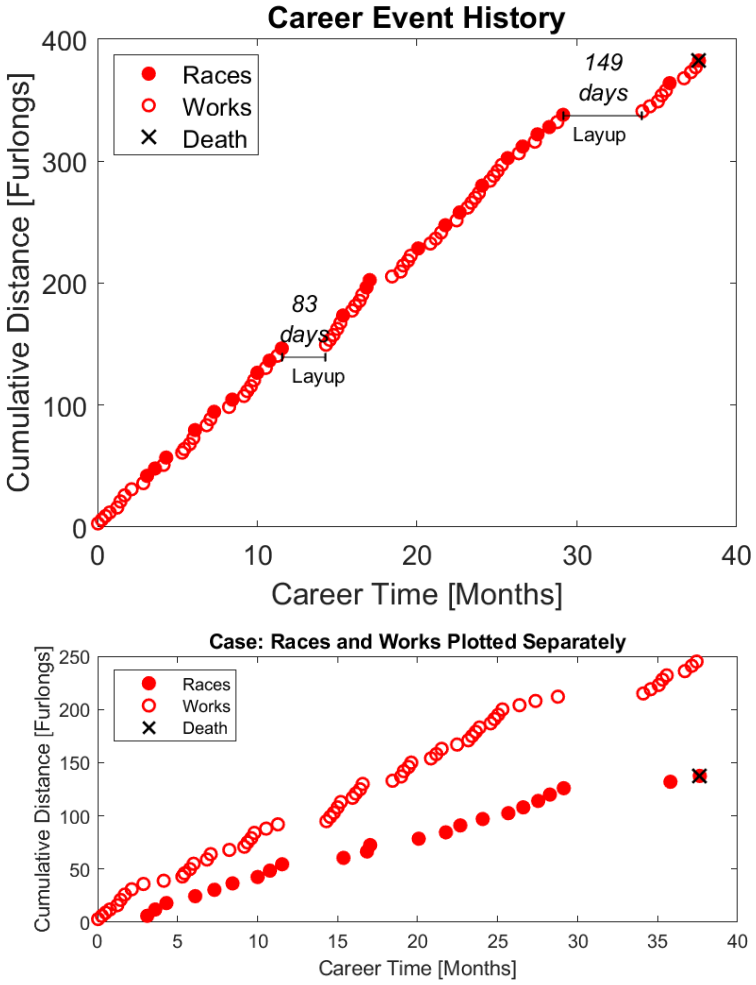
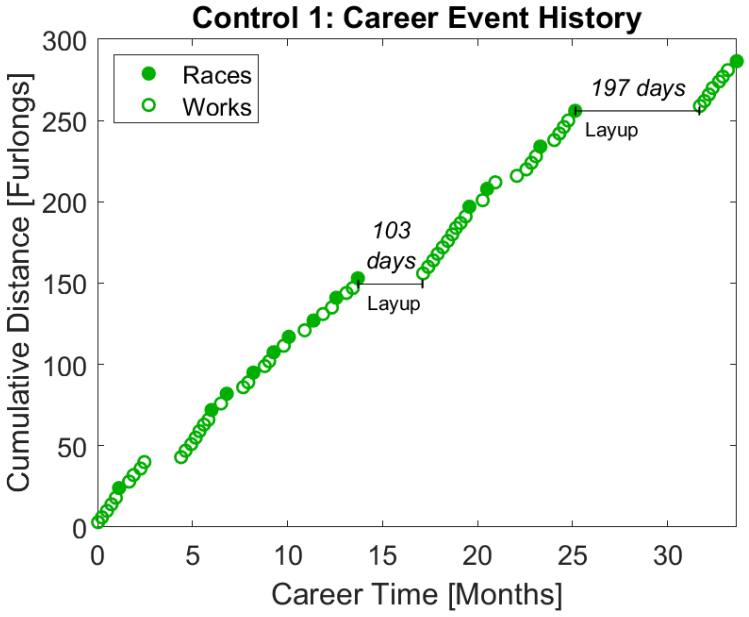
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

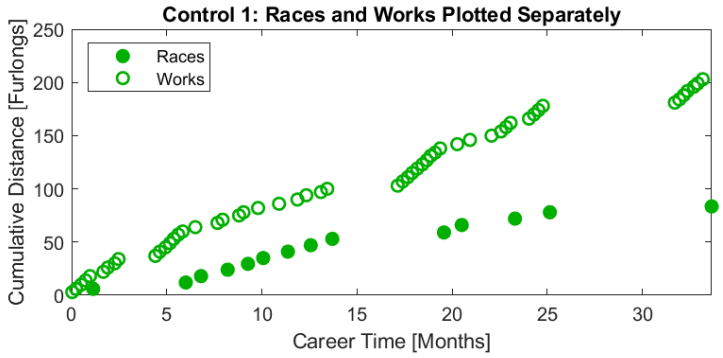
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

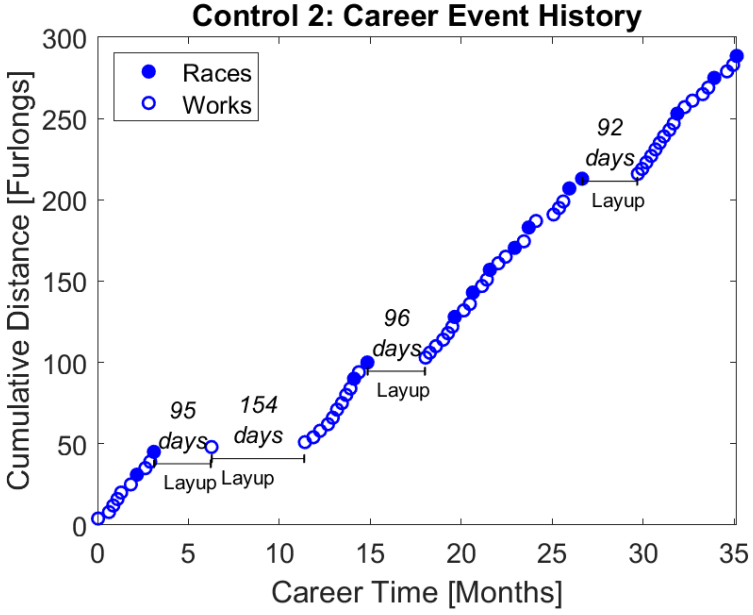


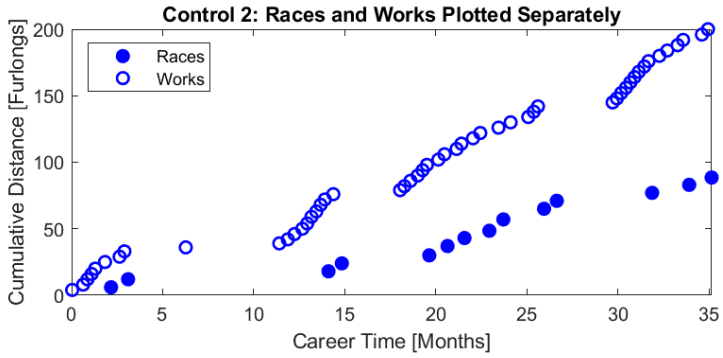
Control 1 High Speed Exercise History



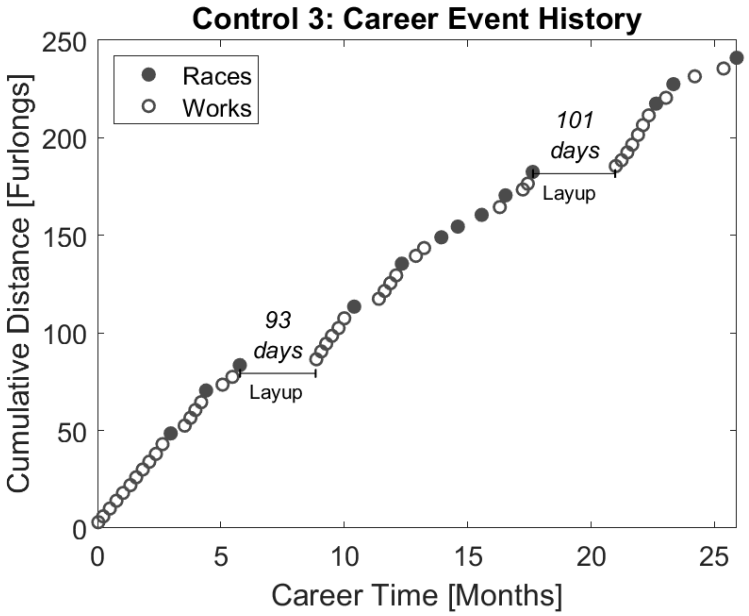


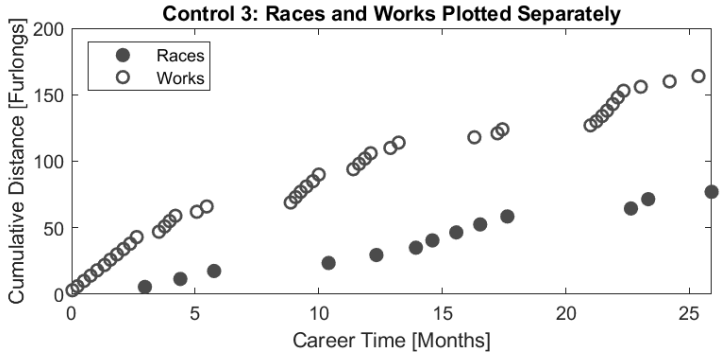
Control 2 High Speed Exercise History



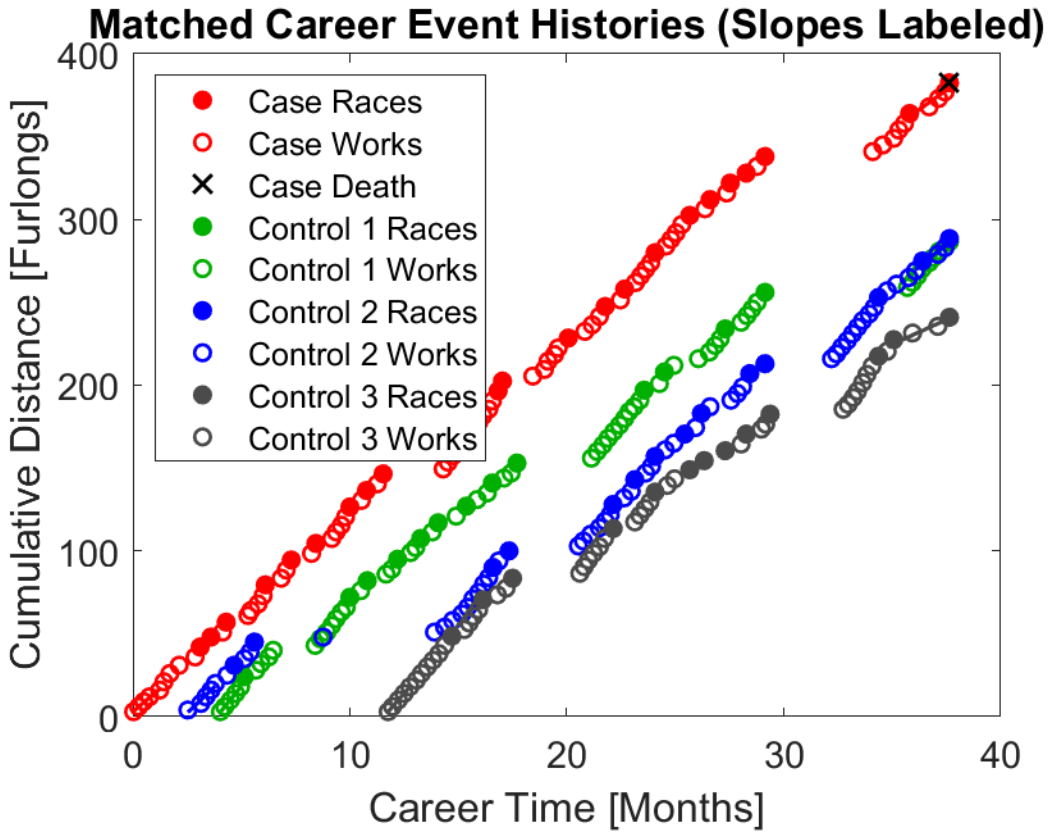


Control 3 High Speed Exercise History

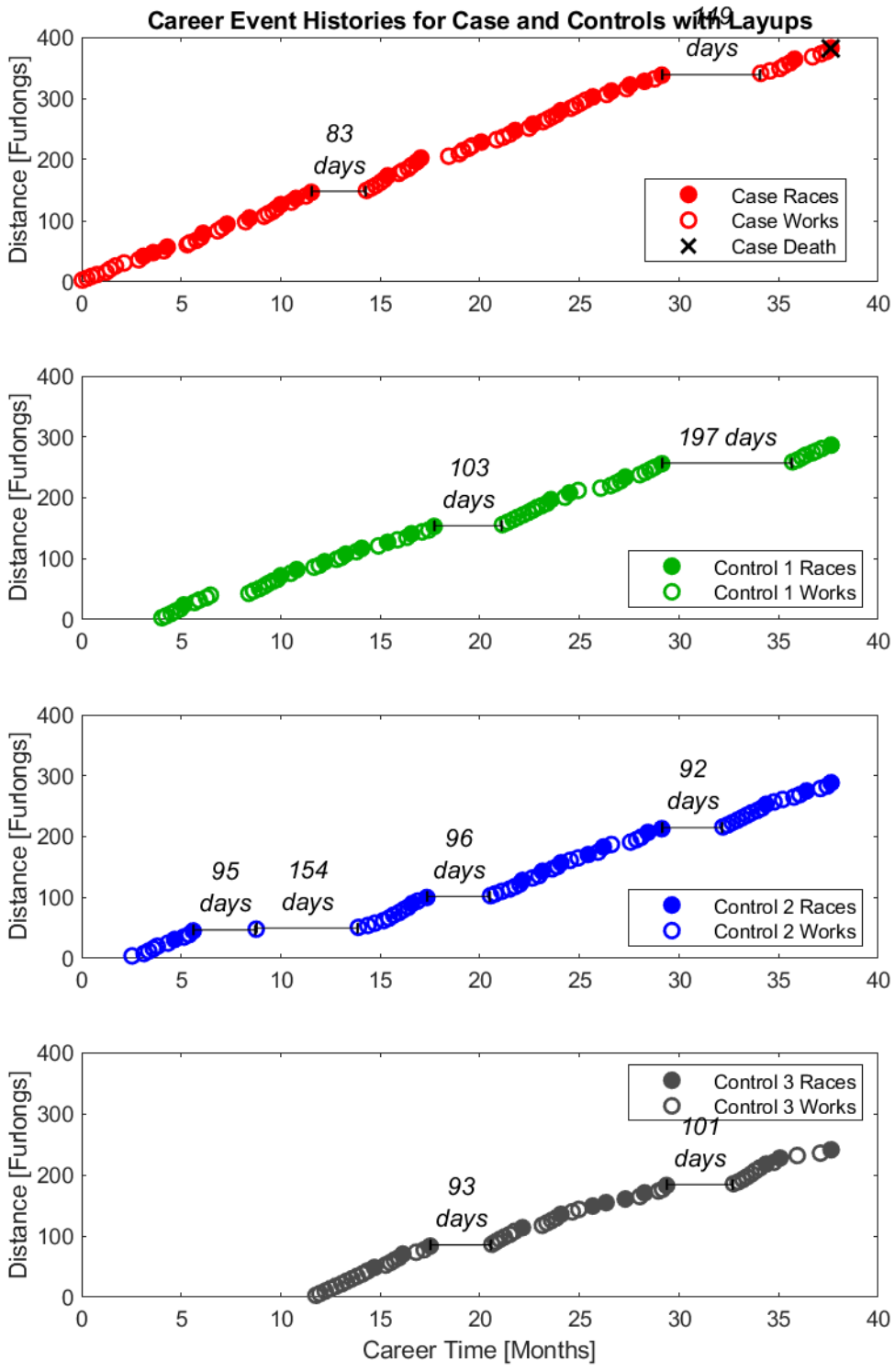


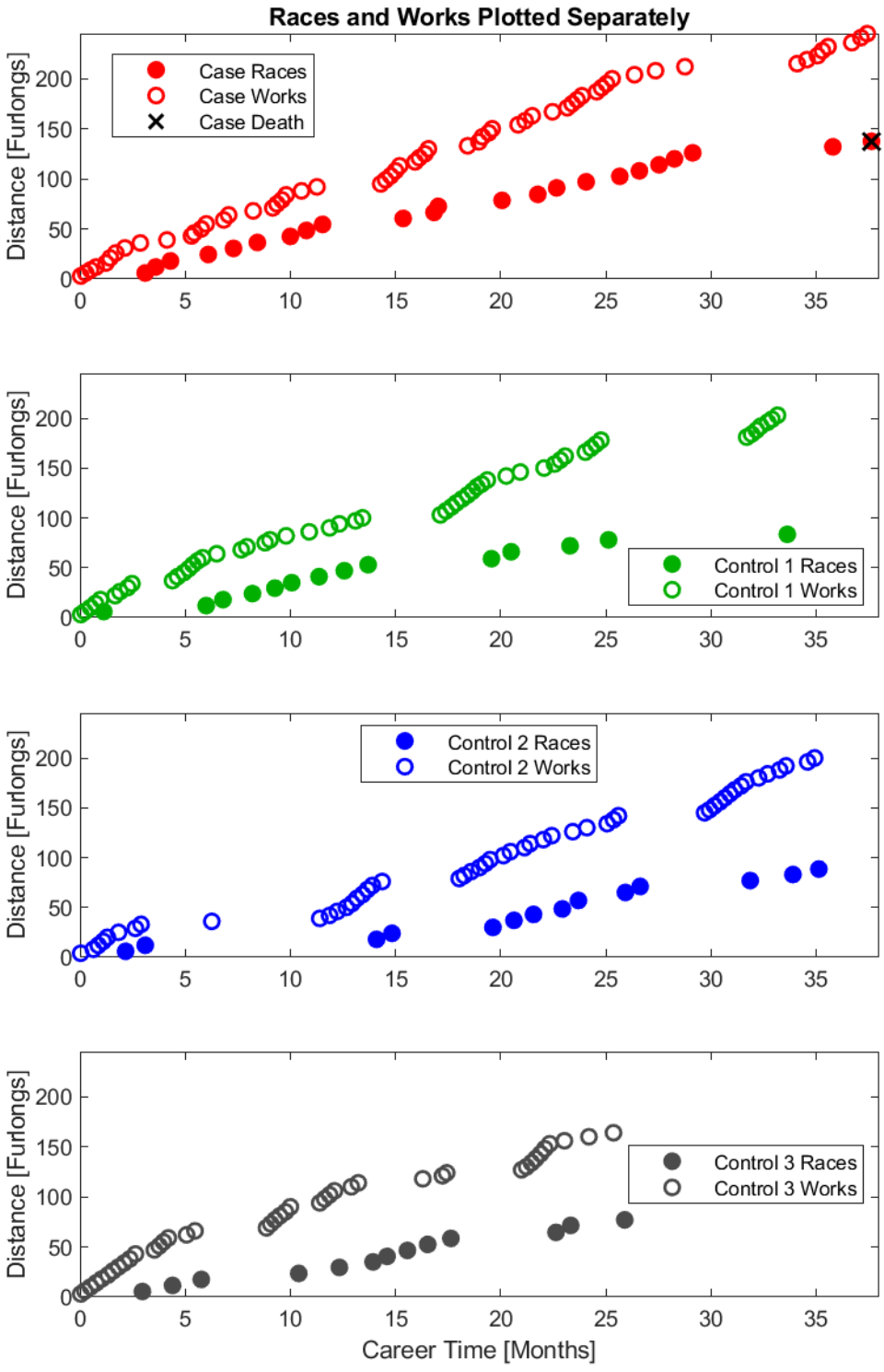


Part 2: Case and Control Horses Plotted Together



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]
Career Time [Months]
83 days
149 days
Case Races
Case Works
Case Death
103 days
197 days
Control 1 Races
Control 1 Works
95 days
154 days
96 days
92 days
Control 2 Races
Control 2 Works
93 days
101 days
Control 3 Races
Control 3 Works


Races and Works Plotted Separately
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Distance [Furlongs]
Career Time [Months]
0
5
10
15
20
25
30
35
50
100
150
200

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
7/23/2023	R	5.5	SAR	Turf	Firm		3U / FM	(S) Aoc45000nw2$/ x-N	0	6
7/17/2023	W	4.0	SAR	Dirt training	Fast	:48.63				
7/8/2023	W	5.0	BEL	Dirt training	Fast	01:03.9				
6/25/2023	W	4.0	BEL	Dirt training	Fast	:47.00				
5/29/2023	R	6.0	BEL	Turf	Firm		3U / FM	(S) Aoc45000nw2$/ x-N	10200	3
5/22/2023	W	4.0	BEL	Dirt training	Fast	:51.69				
5/14/2023	W	5.0	BEL	Dirt training	Fast	01:03.2				
5/7/2023	W	4.0	BEL	Dirt training	Fast	:48.70				
4/22/2023	W	4.0	BEL	Dirt training	Fast	:49.77				
4/8/2023	W	3.0	BEL	Dirt training	Fast	:37.85				
11/10/2022	R	6.0	AQU	Turf	Firm		3U / FM	(S) Aoc45000nw2$/ x-N	3200	5
10/30/2022	W	4.0	BEL	Dirt training	Fast	:48.00				
10/15/2022	R	6.0	BAQ	Dirt	Fast		3U / FM	(S) Aoc45000nw2$/ x-N	3600	5
9/23/2022	R	6.0	BAQ	Turf	Firm		3U / FM	(S) Alw85000nw1$/ x	46750	1
9/18/2022	W	4.0	BEL	Dirt training	Fast	:48.18				

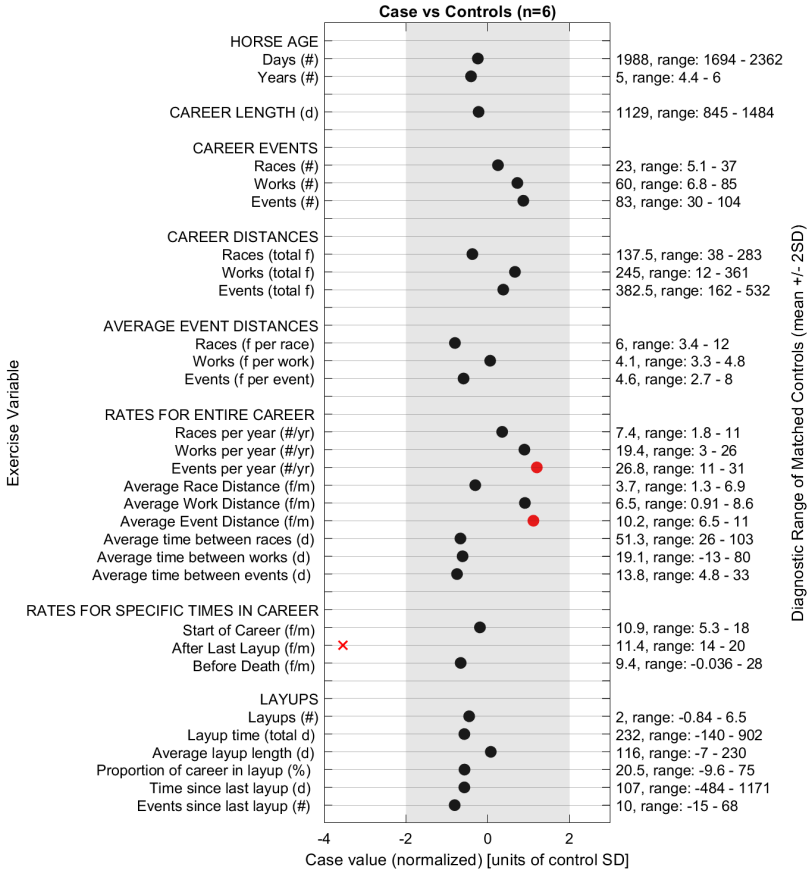
Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/26/2022	R	5.5	SAR	Dirt	Muddy		3U / FM	(S) Alw95000nw1$/ x	713	8
8/19/2022	W	4.0	SAR	Dirt	Fast	:49.49				
7/29/2022	R	5.5	SAR	Turf	Good		3U / FM	(S) Alw95000nw1$/ x	408	7
7/18/2022	W	5.0	SAR	Dirt	Fast	01:02.1				
7/10/2022	W	4.0	BEL	Dirt training	Fast	:50.11				
7/3/2022	W	4.0	BEL	Dirt training	Fast	:48.67				
6/26/2022	W	4.0	BEL	Dirt training	Fast	:50.01				
6/11/2022	R	6.0	BEL	Turf	Firm		3U / FM	(S) Alw80000nw1$/ x	16000	2
6/5/2022	W	4.0	BEL	Dirt training	Fast	:49.35				
5/29/2022	W	4.0	BEL	Dirt training	Fast	:48.90				
5/22/2022	W	4.0	BEL	Dirt training	Fast	:47.63				
5/15/2022	W	4.0	BEL	Dirt training	Good	:48.67				
4/30/2022	R	6.5	BEL	Dirt	Fast		3U / FM	(S) Alw80000nw1$/ x	400	10
4/24/2022	W	4.0	BEL	Dirt	Fast	:48.85				
4/3/2022	R	6.0	AQU	Dirt	Muddy		3U / FM	(S) Alw72000nw1$/ x	14400	2
3/26/2022	W	5.0	BEL	Dirt training	Fast	01:02.1				
3/16/2022	W	4.0	BEL	Dirt training	Fast	:47.51				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
3/6/2022	W	4.0	BEL	Dirt training	Fast	:48.95				
2/11/2022	R	6.0	AQU	Dirt	Fast		4U / FM	(S) Alw72000nw1$/x	2160	6
1/28/2022	W	4.0	BEL	Dirt training	Fast	:50.90				
1/23/2022	W	4.0	BEL	Dirt training	Fast	:51.45				
1/14/2022	W	5.0	BEL	Dirt training	Fast	01:02.0				
1/9/2022	W	4.0	BEL	Dirt training	Fast	:51.00				
12/24/2021	W	3.0	BEL	Dirt training	Fast	:36.56				
11/12/2021	R	6.0	AQU	Dirt	Muddy		3U / FM	(S) Alw72000nw1$/x	720	7
11/6/2021	R	6.0	BEL	Turf	Firm		3U / FM	(S) Alw80000nw1$/x	3200	5
10/29/2021	W	5.0	BEL	Dirt training	Fast	01:02.9				
10/24/2021	W	4.0	BEL	Dirt training	Fast	:50.71				
10/16/2021	W	4.0	BEL	Dirt training	Fast	:50.03				
10/10/2021	W	4.0	BEL	Dirt training	Fast	:53.12				
9/23/2021	R	6.0	BEL	Turf	Firm		3U / FM	(S) Alw80000nw1$/x	16000	2
9/18/2021	W	5.0	BEL	Dirt training	Fast	01:04.4				
9/12/2021	W	5.0	BEL	Dirt training	Fast	01:04.2				
9/5/2021	W	4.0	SAR	Dirt	Fast	:49.22				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/29/2021	W	4.0	SAR	Dirt	Fast	:50.04				
8/22/2021	W	3.0	SAR	Dirt	Fast	:37.79				
5/31/2021	R	6.0	BEL	Dirt	Muddy		3U / FM	(S) Alw80000nw1$/ x	600	8
5/23/2021	W	4.0	BEL	Dirt training	Fast	:50.00				
5/8/2021	R	6.0	BEL	Turf	Good		3U / FM	(S) Alw80000nw1$/ x	9600	3
5/1/2021	W	4.0	BEL	Dirt training	Fast	:51.23				
4/15/2021	R	6.0	AQU	Dirt	Sloppy		3U / FM	(S) Msw	38500	1
4/9/2021	W	5.0	BEL	Dirt training	Fast	01:03.1				
4/3/2021	W	4.0	BEL	Dirt training	Fast	:48.21				
3/27/2021	W	4.0	BEL	Dirt training	Fast	:50.45				
3/21/2021	W	3.0	BEL	Dirt training	Fast	:36.27				
2/27/2021	R	6.0	AQU	Dirt	Sloppy		3 /F	(S) Msw	300	6
2/21/2021	W	4.0	BEL	Dirt training	Fast	:49.31				
1/24/2021	R	6.0	AQU	Dirt	Fast		3 /F	(S) Msw	14000	2
1/17/2021	W	5.0	BEL	Dirt training	Good	01:01.7				
1/10/2021	W	4.0	BEL	Dirt training	Fast	:47.88				
12/19/2020	R	6.5	AQU	Dirt	Fast		2 /F	(S) Msw	4200	4
12/16/2020	W	5.0	BEL	Dirt training	Fast	01:06.1				
12/9/2020	W	4.0	BEL	Dirt training	Fast	:49.10				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
11/29/2020	W	3.0	BEL	Dirt training	Fast	:38.24				
11/25/2020	W	4.0	BEL	Dirt training	Fast	:51.18				
10/26/2020	R	6.0	FL	Dirt	Sloppy		2	(S) NYBrdrFutB -218k	10904	4
10/21/2020	W	3.0	BEL	Dirt training	Fast	:38.05				
10/5/2020	R	6.0	FL	Dirt	Fast		2 /F	(S) LadyFingrB -119k	11859	3
9/20/2020	R	6.0	BEL	Dirt	Fast		2 /F	(S) Msw	6240	3
9/13/2020	W	5.0	BEL	Dirt	Fast	01:02.1				
8/22/2020	W	5.0	SAR	Dirt	Fast	01:03.0				
8/9/2020	W	5.0	SAR	Dirt training	Fast	01:04.2				
8/1/2020	W	5.0	SAR	Dirt training	Fast	01:03.2				
7/26/2020	W	4.0	SAR	Dirt	Fast	:49.09				
7/12/2020	W	3.0	BEL	Dirt training	Fast	:36.85				
7/4/2020	W	3.0	BEL	Dirt training	Good	:37.66				
6/27/2020	W	3.0	BEL	Dirt training	Fast	:38.85				
6/20/2020	W	3.0	BEL	Dirt training	Fast	:38.90				

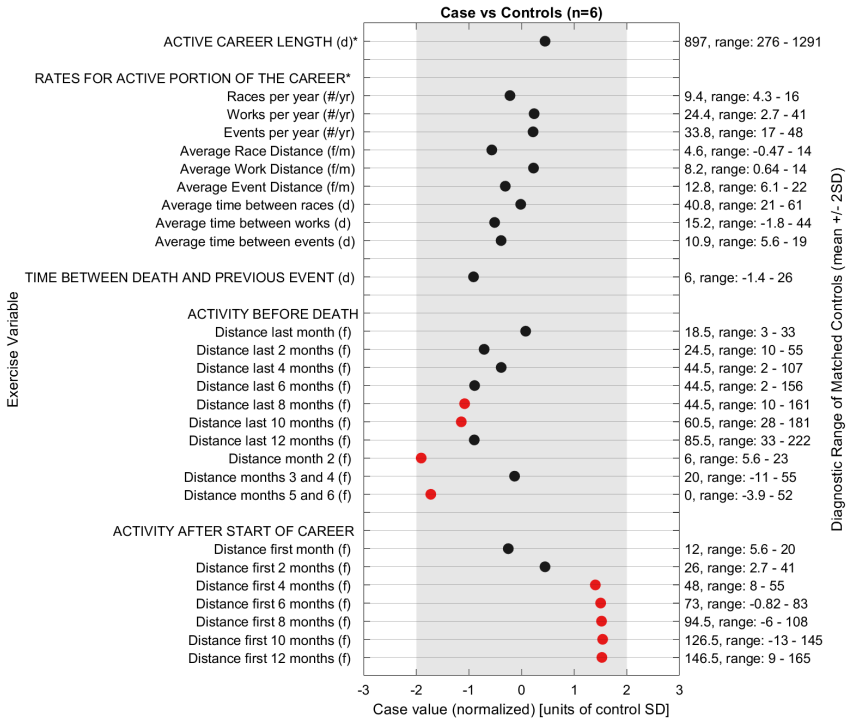
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (5+ year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, female, Thoroughbreds (n=6) (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.



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^Rates are calculated over 2 to 5 events.

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Exercise History Report (Full)
Closed Caption

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

Exercise History Report (Full)

J.D. Wheat Veterinary Orthopedic Research Laboratory

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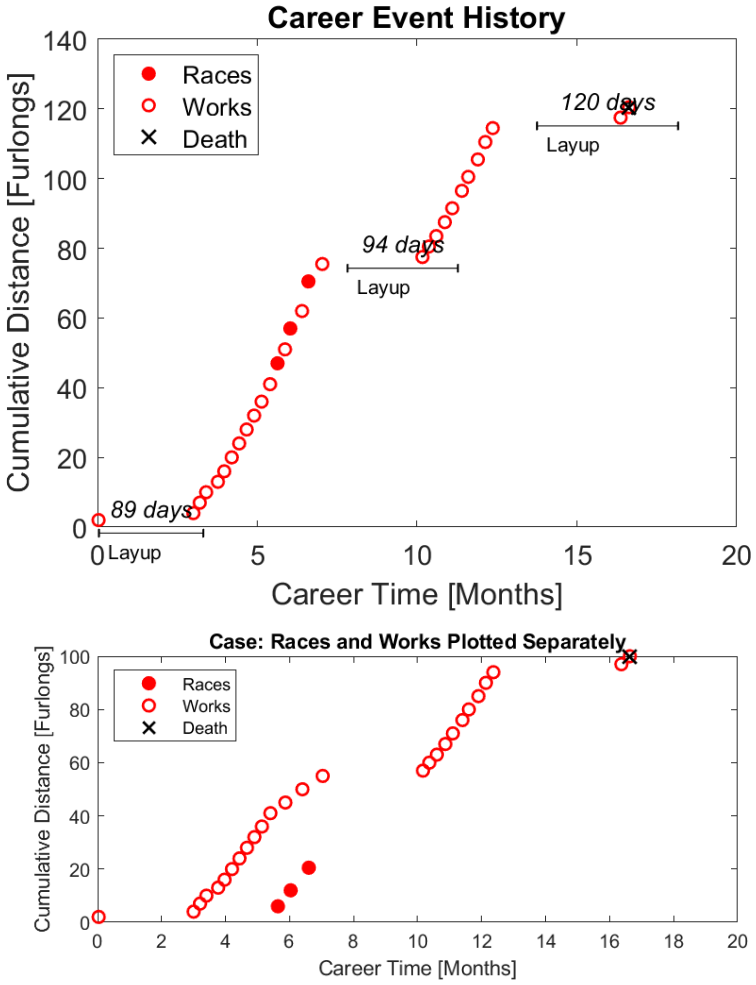
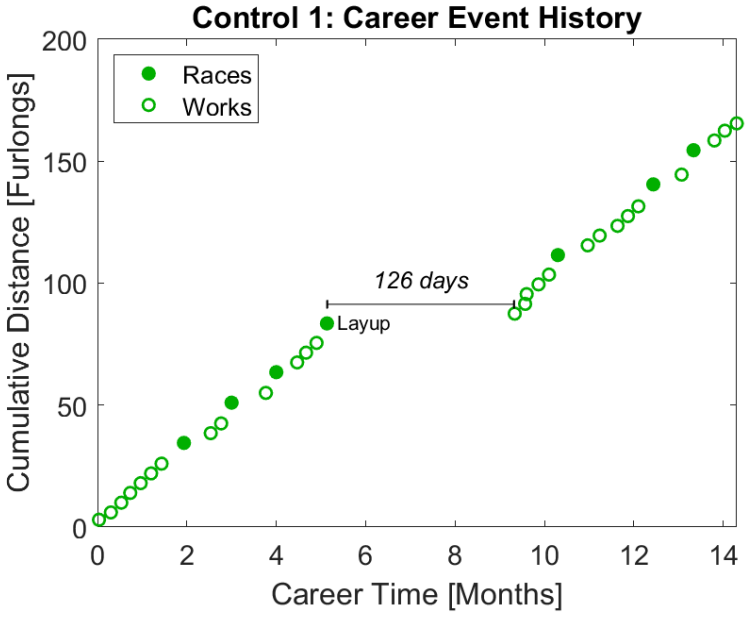
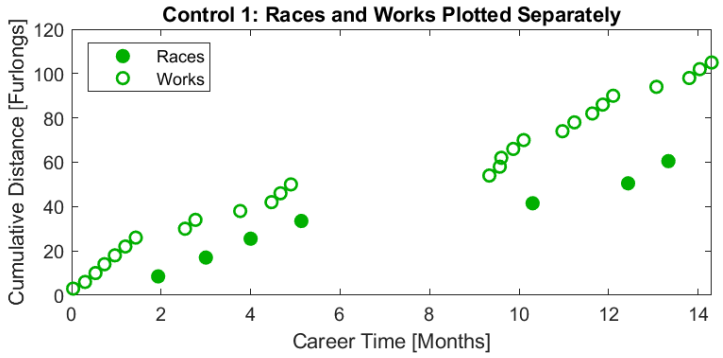
Case Horse High Speed Exercise History

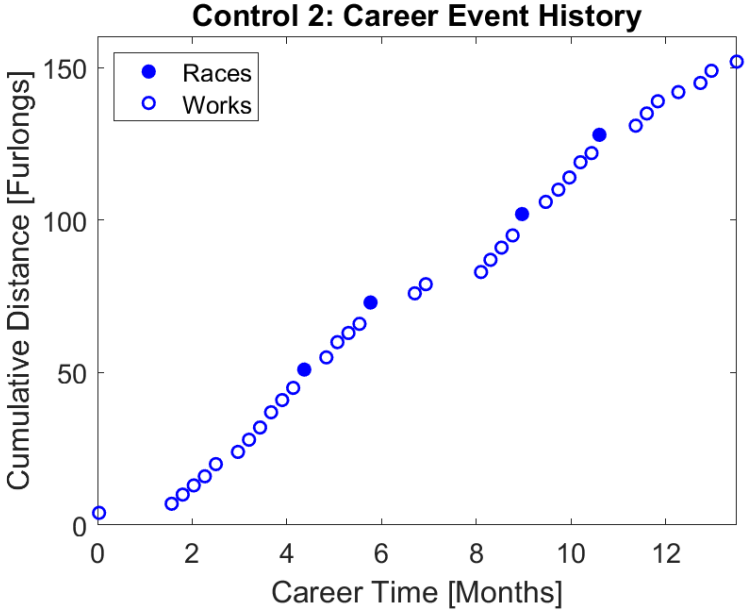


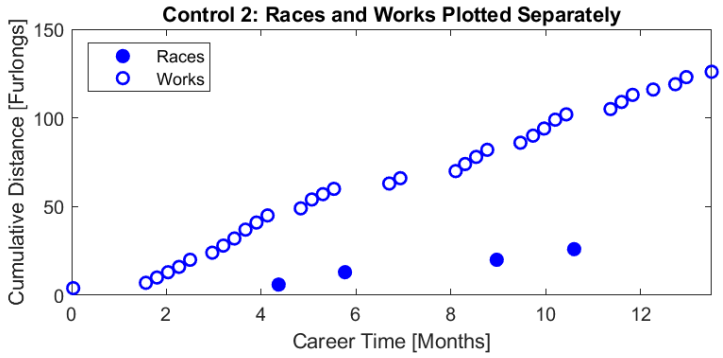
Control 1 High Speed Exercise History



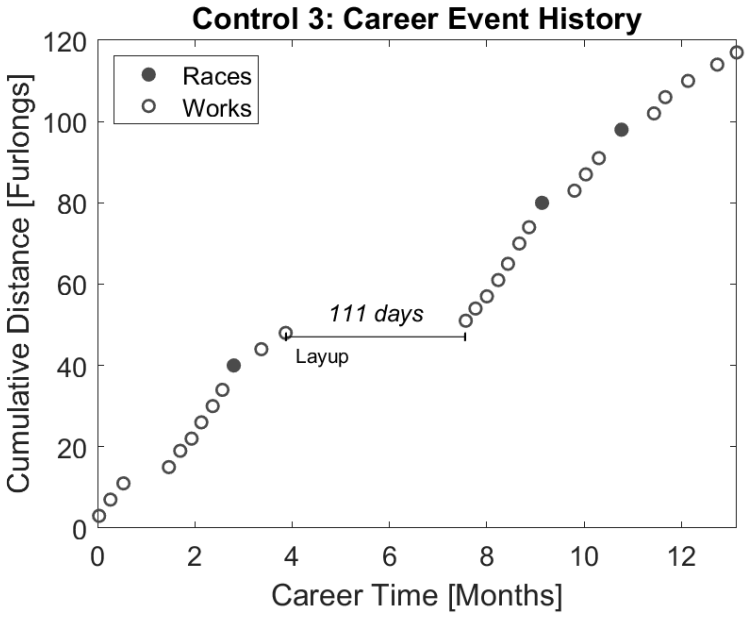


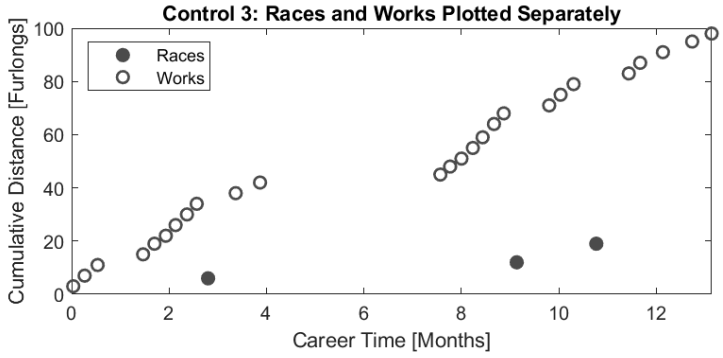
Control 2 High Speed Exercise History



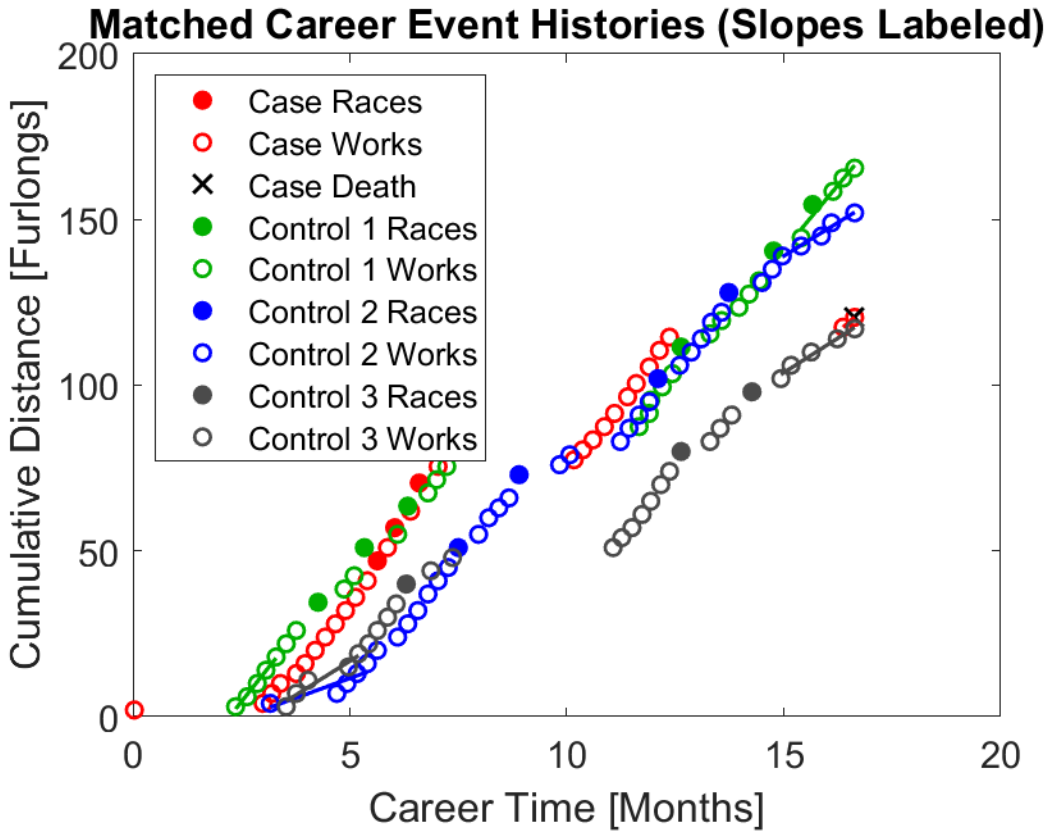


Control 3 High Speed Exercise History

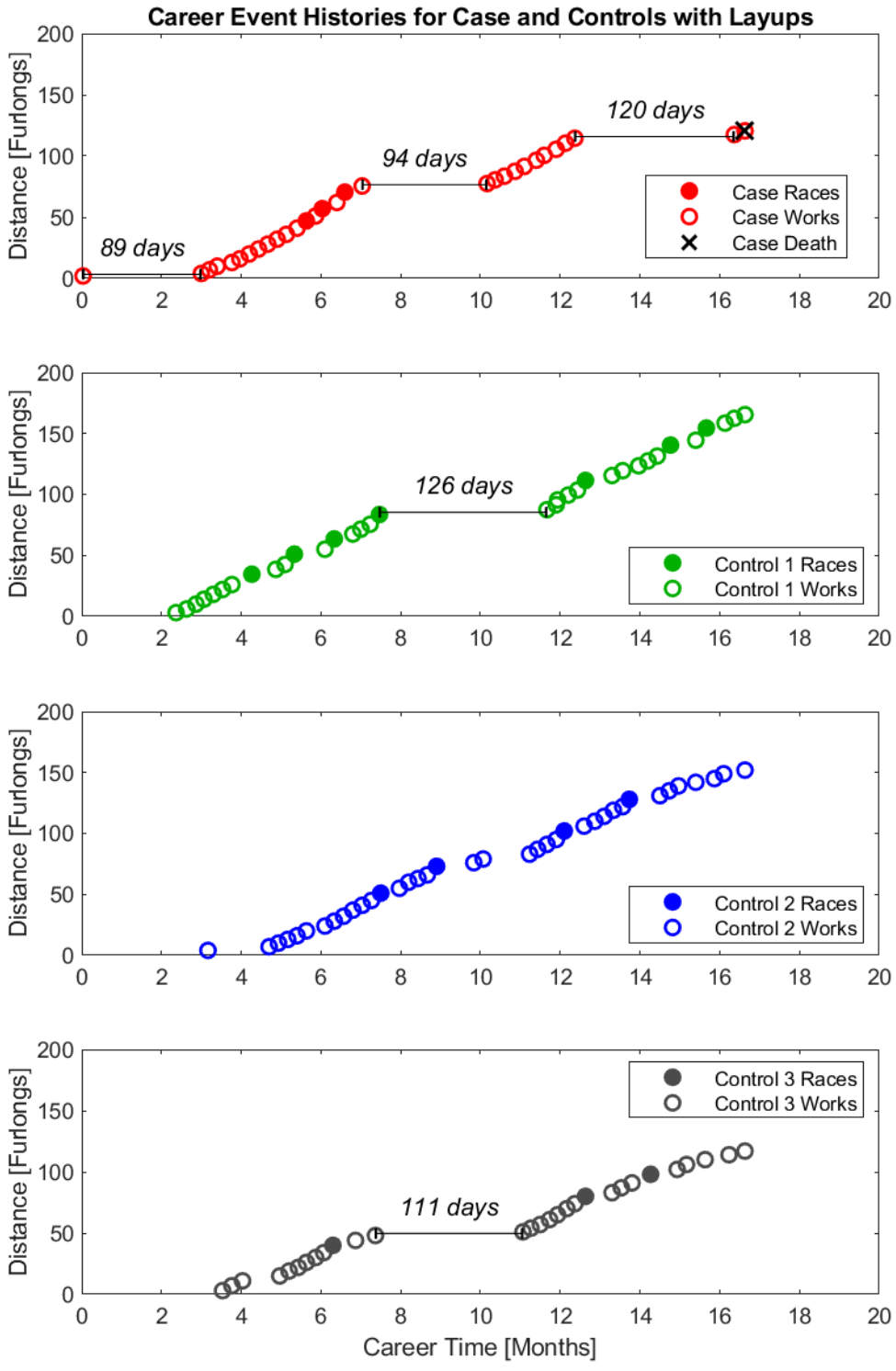


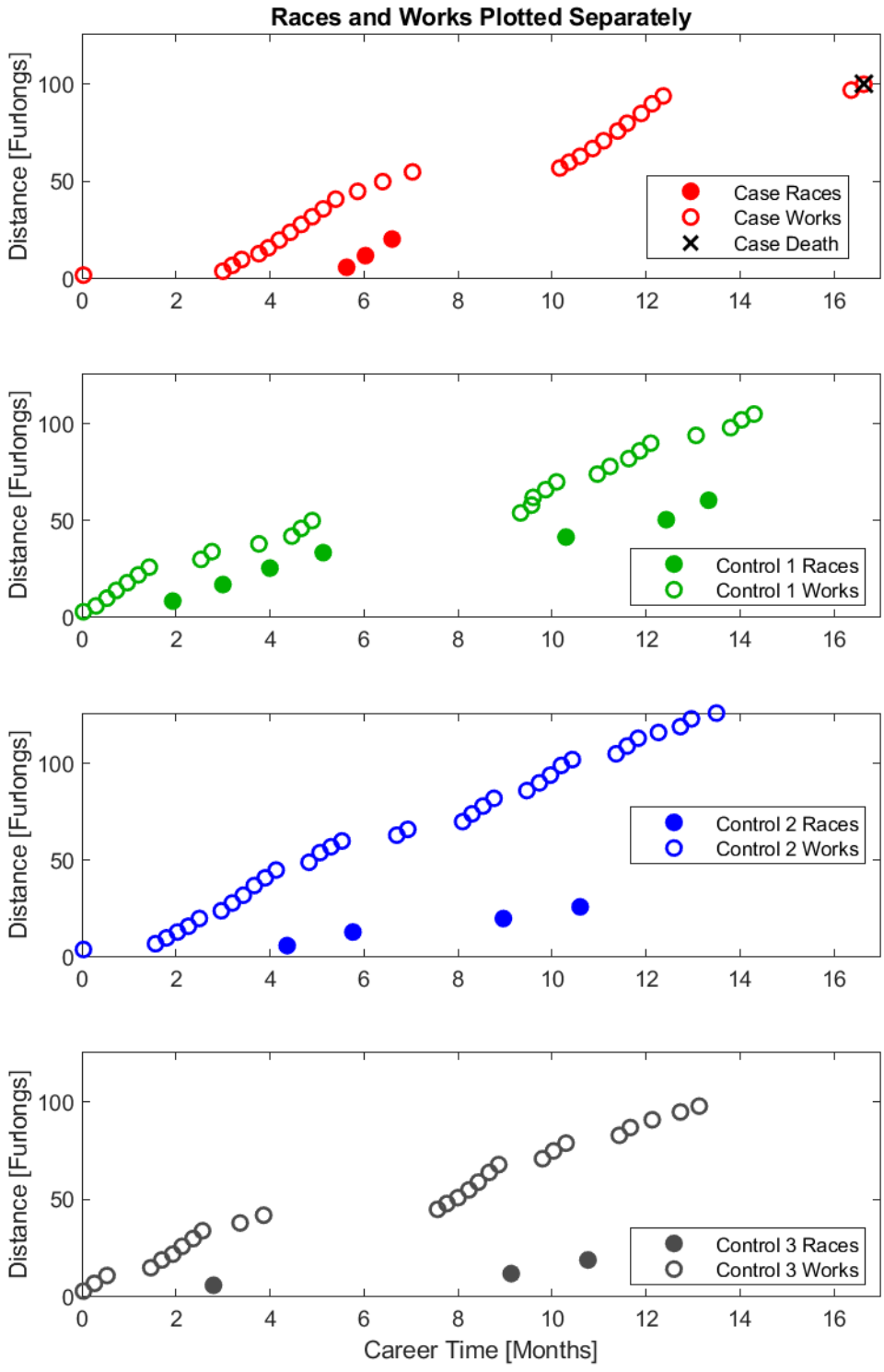


Part 2: Case and Control Horses Plotted Together



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]
89 days
94 days
120 days
Case Races
Case Works
Case Death
126 days
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
111 days
Control 3 Races
Control 3 Works
Career Time [Months]

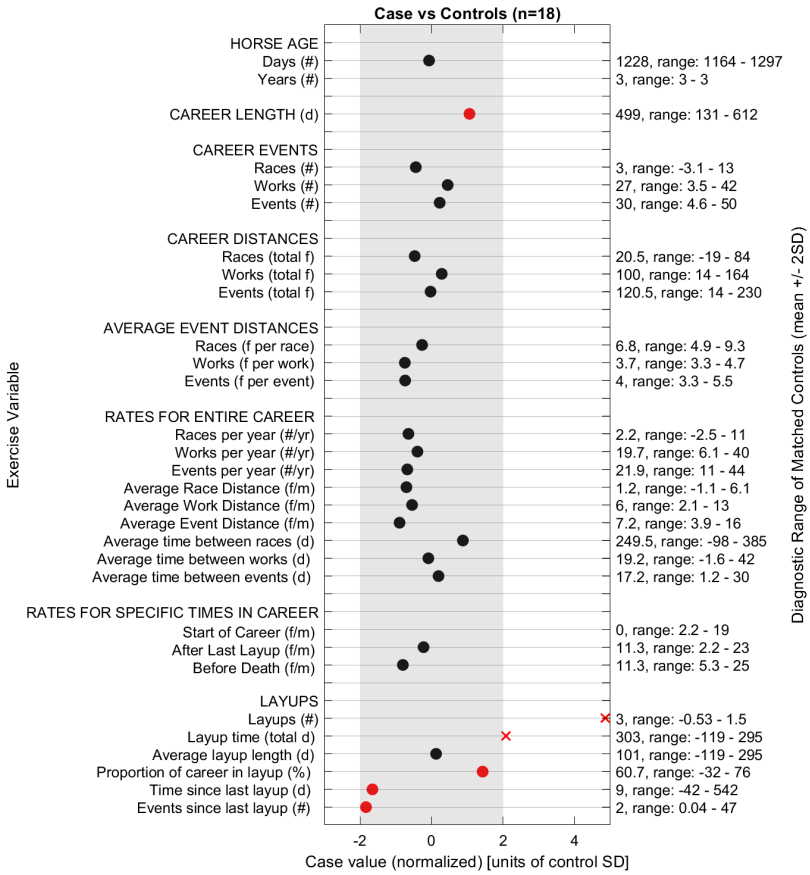

Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/6/2023	W	3.0	SAR	Dirt	Fast	:37.08				
7/29/2023	W	3.0	KEE	Dirt	Fast	:36.40				
3/31/2023	W	4.0	KEE	Dirt	Fast	:48.80				
3/24/2023	W	5.0	TP	AllWthr	Fast	01:02.4				
3/17/2023	W	5.0	TP	AllWthr	Fast	01:02.0				
3/8/2023	W	4.0	TP	AllWthr	Fast	:48.60				
3/2/2023	W	5.0	TP	AllWthr	Fast	01:02.6				
2/21/2023	W	4.0	KEE	All Weather Training	Fast	:48.60				
2/14/2023	W	4.0	KEE	All Weather Training	Fast	:48.80				
2/6/2023	W	3.0	KEE	All Weather Training	Fast	:37.00				
1/30/2023	W	3.0	KEE	All Weather Training	Fast	:38.00				
1/24/2023	W	2.0	SLH	Dirt	Good	:24.20				
10/22/2022	W	5.0	CD	Dirt	Fast	01:04.2				
10/9/2022	R	8.5	KEE	Dirt	Fast		2 /F	Aoc100000nw1/21450 x-N		2
10/3/2022	W	5.0	CD	Dirt	Fast	01:01.4				
9/22/2022	R	6.0	CD	Dirt	Fast		2 /F	(A) Msw	52320	1
9/17/2022	W	4.0	KEE	Dirt	Fast	:48.80				
9/10/2022	R	6.0	KD	Turf	Firm		2 /F	Msw	1200	6
9/3/2022	W	5.0	CD	Dirt	Fast	01:02.2				
8/26/2022	W	4.0	CD	Dirt	Fast	:49.60				
8/19/2022	W	4.0	CD	Dirt	Fast	:49.40				
8/12/2022	W	4.0	CD	Dirt	Fast	:48.80				
8/5/2022	W	4.0	CD	Dirt	Good	:48.20				
7/29/2022	W	4.0	CD	Dirt	Fast	:50.40				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
7/22/2022	W	3.0	CD	Dirt	Fast	:37.40				
7/16/2022	W	3.0	CD	Dirt	Fast	:36.20				
7/5/2022	W	3.0	SLH	Dirt	Good	:37.40				
6/29/2022	W	3.0	SLH	Dirt	Good	:39.00				
6/23/2022	W	2.0	SLH	Dirt	Good	:24.20				
3/26/2022	W	2.0	SLH	Dirt	Good	:24.30				

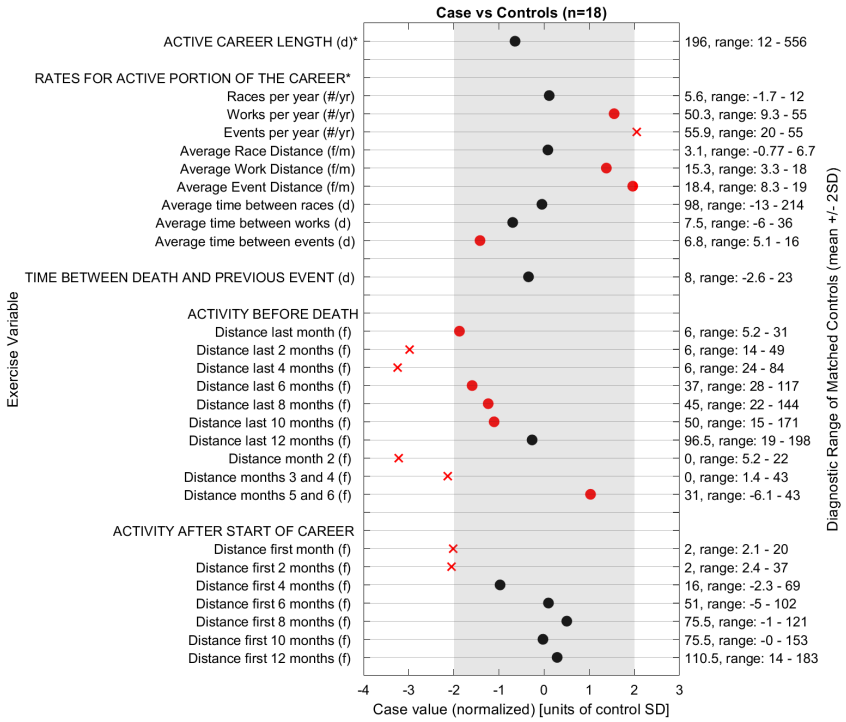
Part 4: Comparison of Exercise Variables between Case Horse and 18 Control Horses (3 year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, female, Thoroughbreds (n=18) (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 3 year old, female, Thoroughbreds (n=18) (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.

Exercise History Report (Full)
Ever Summer

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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).

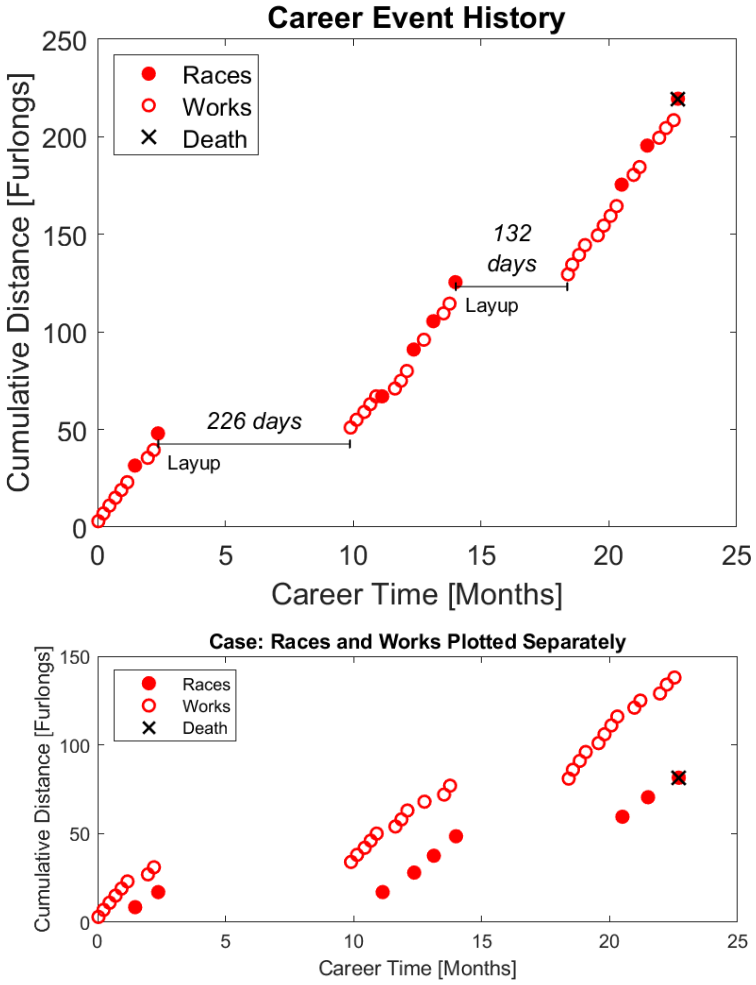
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

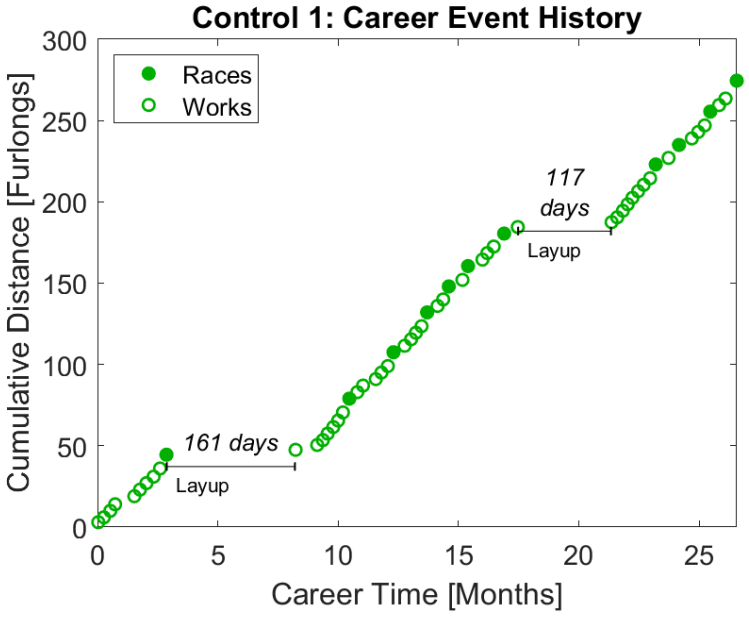
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

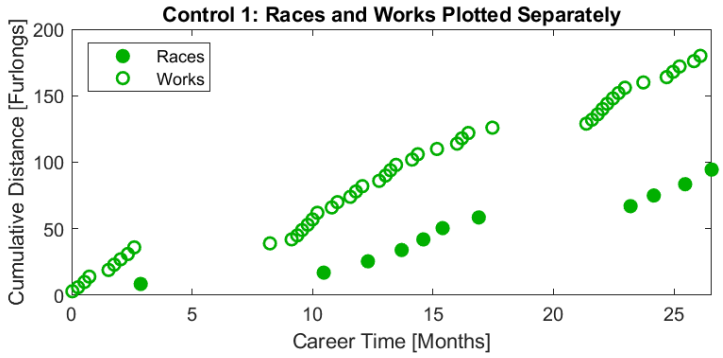
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

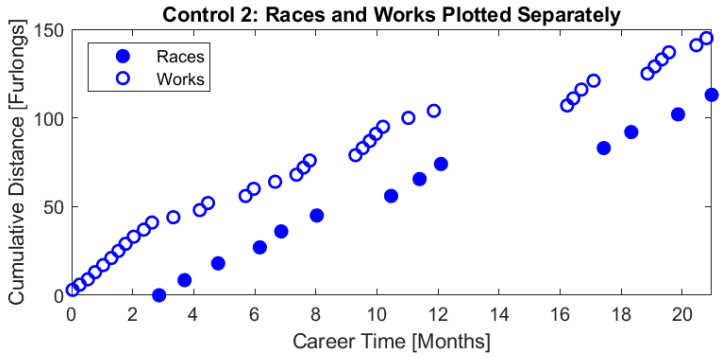


Control 1 High Speed Exercise History

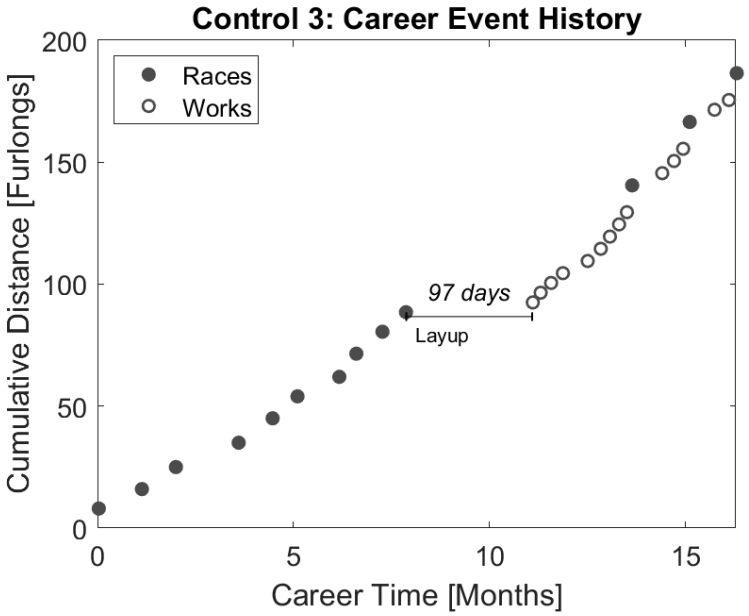


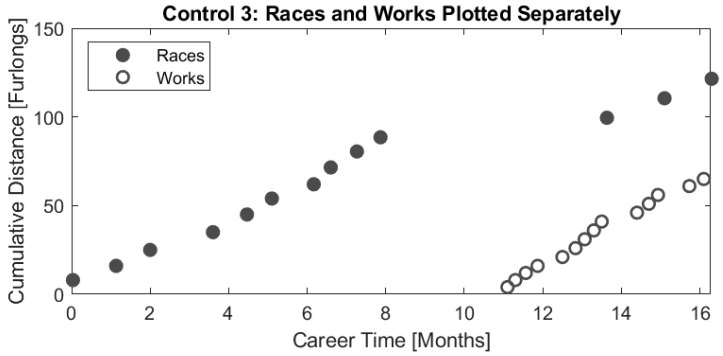


Control 2 High Speed Exercise History

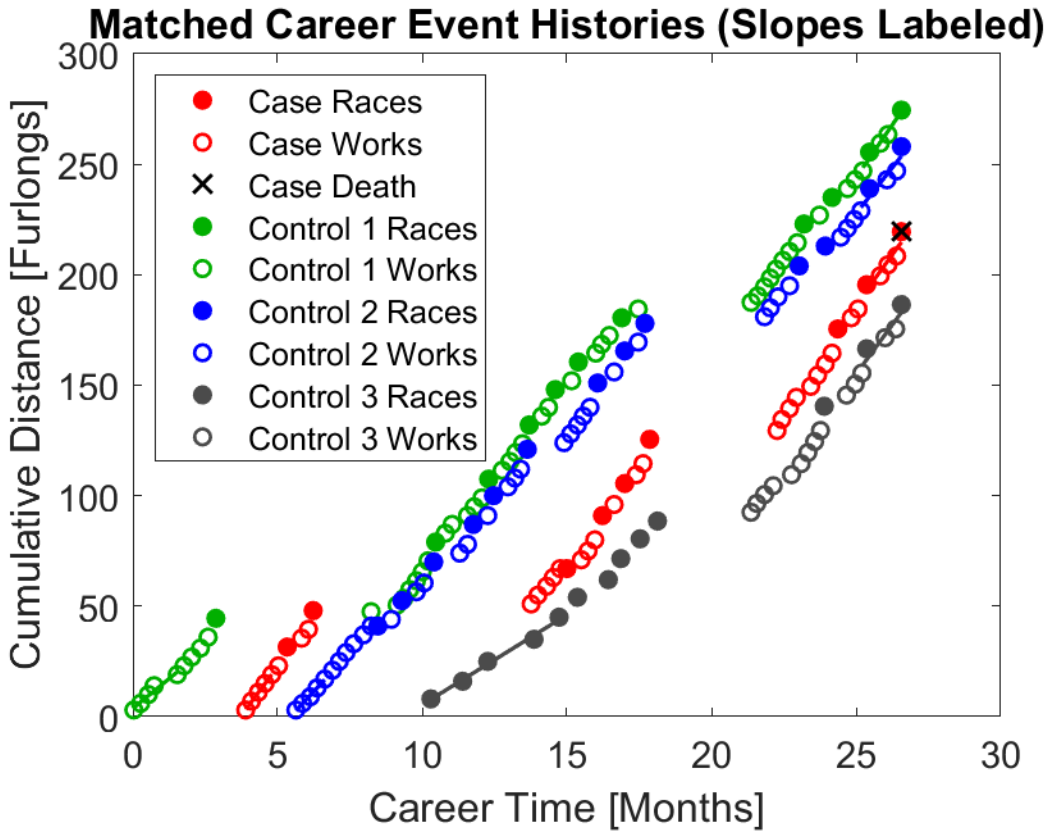


Control 3 High Speed Exercise History

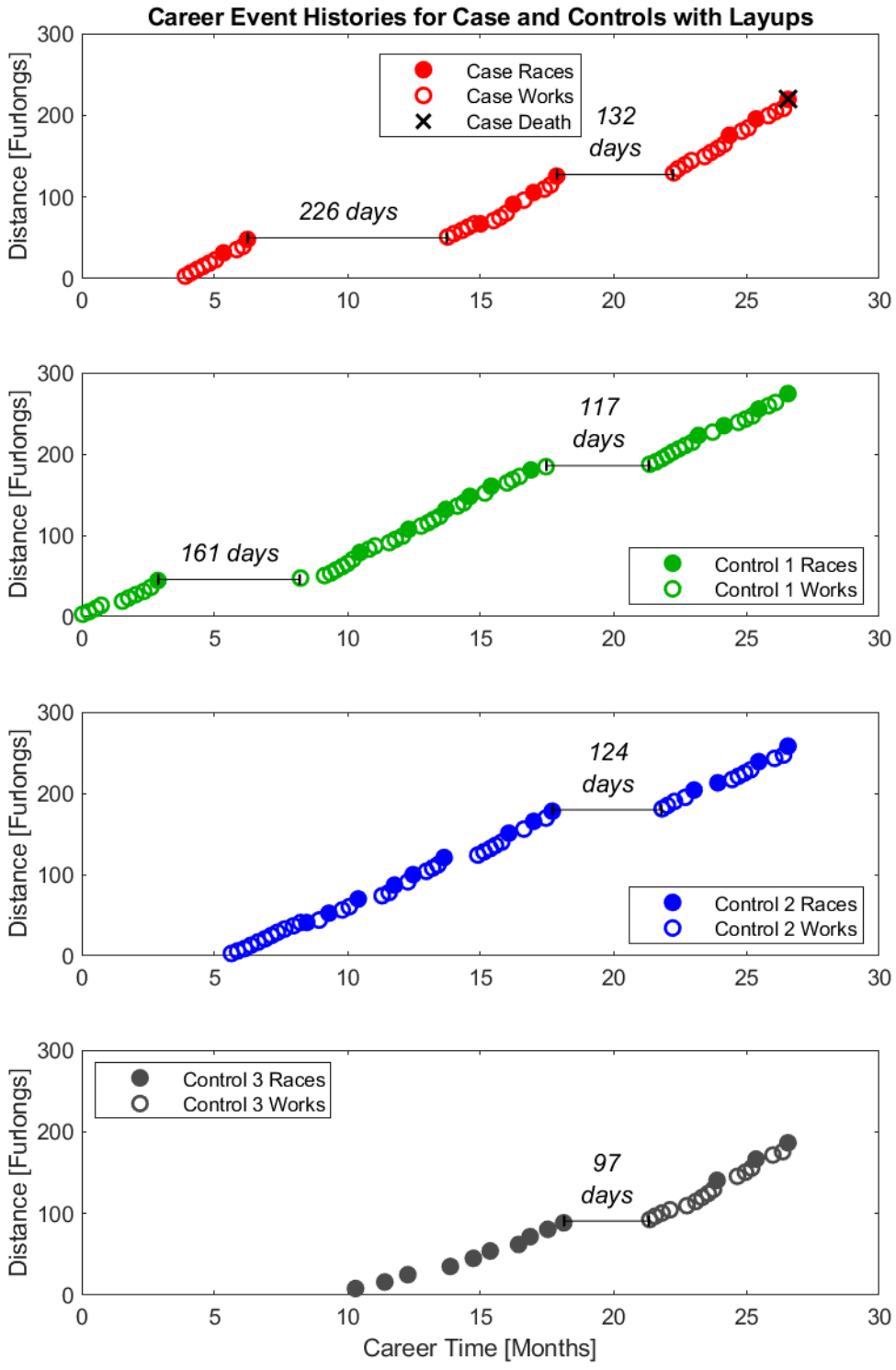


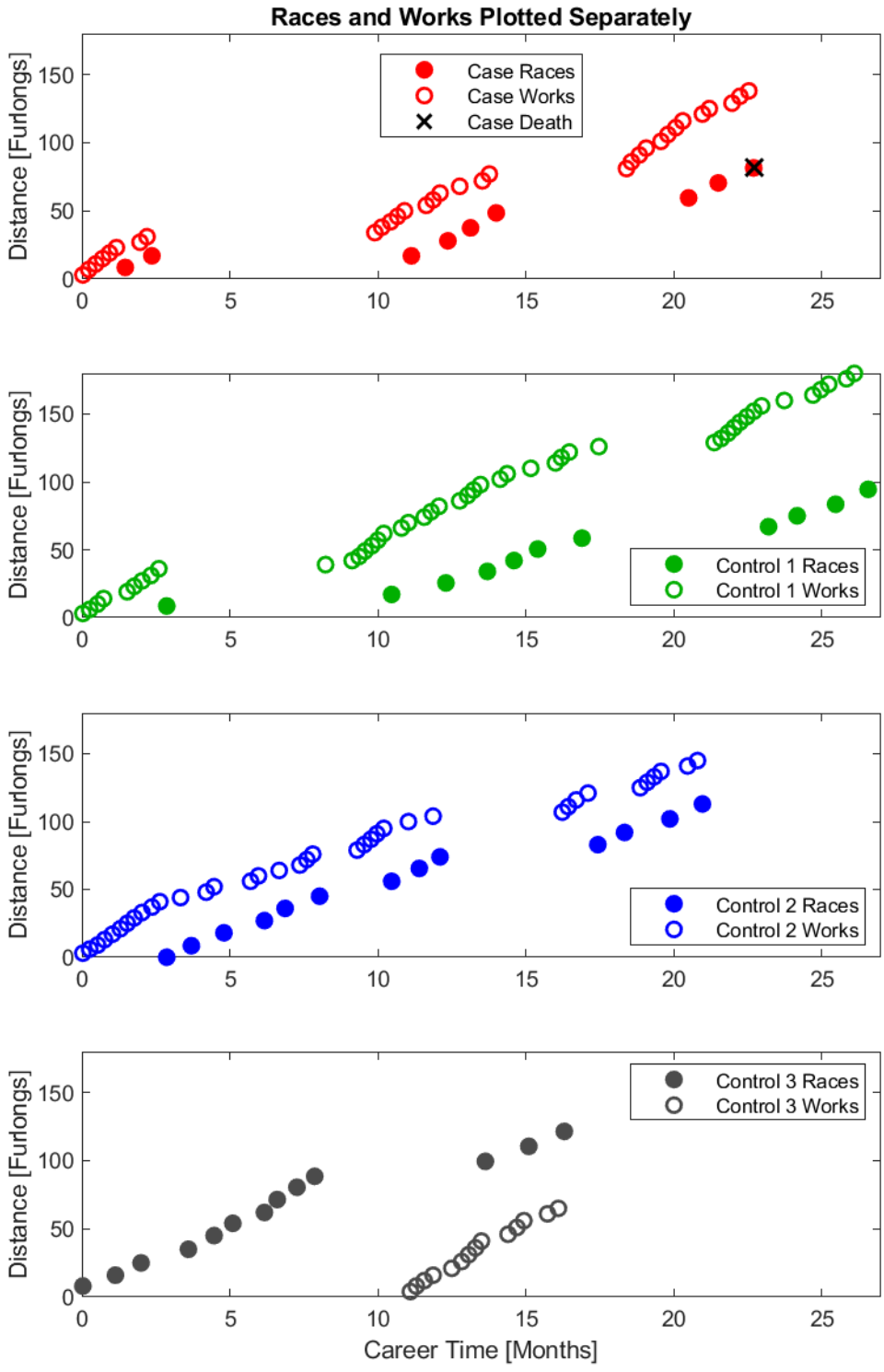


Part 2: Case and Control Horses Plotted Together



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
226 days
132 days
Control 1 Races
Control 1 Works
161 days
117 days
Control 2 Races
Control 2 Works
124 days
Control 3 Races
Control 3 Works
97 days
Career Time [Months]

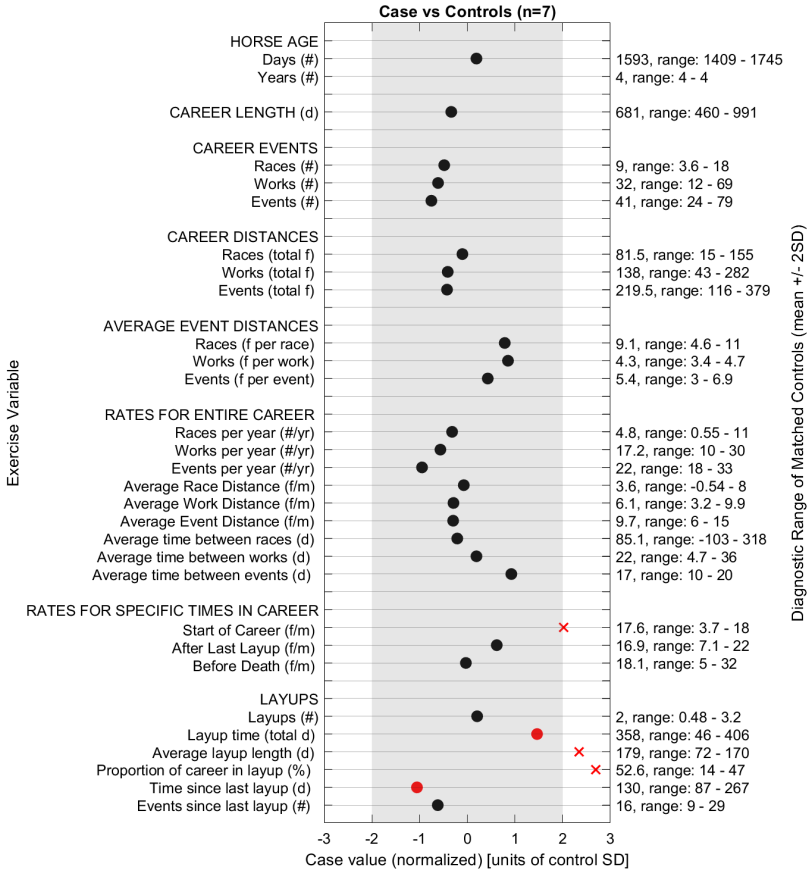

Races and Works Plotted Separately
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Distance [Furlongs]
Career Time [Months]
0
5
10
15
20
25
50
100
150

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/6/2023	R	11.0	SAR	Turf	Good		3U / FM	Aoc62500nw2$0 x-N	0	5
8/1/2023	W	4.0	SAR	Dirt training	Fast	:51.25				
7/23/2023	W	5.0	BEL	Dirt	Fast	01:02.4				
7/15/2023	W	4.0	BEL	Dirt	Fast	:50.29				
7/1/2023	R	11.0	DEL	Turf	Soft		3U / FM	RGDckMemG3 -250k	50000	2
6/22/2023	W	4.0	BEL	Dirt	Fast	:49.83				
6/15/2023	W	5.0	BEL	Dirt	Fast	01:03.7				
6/1/2023	R	11.0	BEL	Turf	Firm		3U / FM	Alw95000nw1$5 x	22250	1
5/26/2023	W	5.0	BEL	Dirt	Fast	01:02.9				
5/19/2023	W	5.0	BEL	Dirt	Fast	01:03.1				
5/11/2023	W	5.0	BEL	Dirt	Fast	01:02.2				
5/4/2023	W	5.0	BEL	Dirt	Good	01:02.8				
4/19/2023	W	5.0	PAY	Dirt	Fast	01:02.0				
4/12/2023	W	5.0	PAY	Dirt	Fast	01:02.6				
4/4/2023	W	5.0	PAY	Dirt	Fast	01:03.4				
3/30/2023	W	4.0	PAY	Dirt	Fast	:50.40				
11/18/2022	R	11.0	AQU	Turf	Good		3U / FM	Alw90000nw1$0 x	0	10
11/11/2022	W	5.0	BEL	Dirt	Fast	01:02.3				
11/4/2022	W	4.0	BEL	Dirt	Fast	:50.55				
10/23/2022	R	9.5	BAQ	Turf	Firm		3U / FM	Alw105000nw1$2 x	4200	5
10/12/2022	W	5.0	BEL	Dirt	Fast	01:02.2				
9/30/2022	R	11.0	DEL	Turf	Firm		3U / FM	Msw	25200	1
9/22/2022	W	5.0	BEL	Dirt	Fast	01:01.9				
9/15/2022	W	4.0	BEL	Dirt	Fast	:48.87				
9/8/2022	W	4.0	BEL	Dirt training	Fast	:49.70				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/24/2022	R	0.0	DEL	Turf	Firm		3U / FM	Msw	4620	3
8/17/2022	W	4.0	BEL	Dirt training	Fast	:48.90				
8/10/2022	W	4.0	BEL	Dirt	Fast	:49.55				
8/3/2022	W	4.0	BEL	Dirt	Fast	:48.48				
7/25/2022	W	4.0	BEL	Dirt	Fast	:52.00				
7/18/2022	W	3.0	BEL	Dirt	Fast	:38.44				
12/4/2021	R	8.5	AQU	Turf	Firm		2 /F	Msw	4800	4
11/29/2021	W	4.0	BEL	Dirt	Fast	:50.30				
11/22/2021	W	4.0	BEL	Dirt	Fast	:49.47				
11/7/2021	R	8.5	BEL	Turf	Firm		2 /F	Msw	3600	5
10/29/2021	W	4.0	SAR	Turf	Yielding	:51.95				
10/22/2021	W	4.0	SAR	Turf	Yielding	:51.45				
10/15/2021	W	4.0	SAR	Dirt training	Fast	:50.31				
10/8/2021	W	4.0	SAR	Turf	Yielding	:51.95				
10/1/2021	W	4.0	SAR	Dirt training	Fast	:51.99				
9/25/2021	W	3.0	SAR	Dirt training	Fast	:39.50				

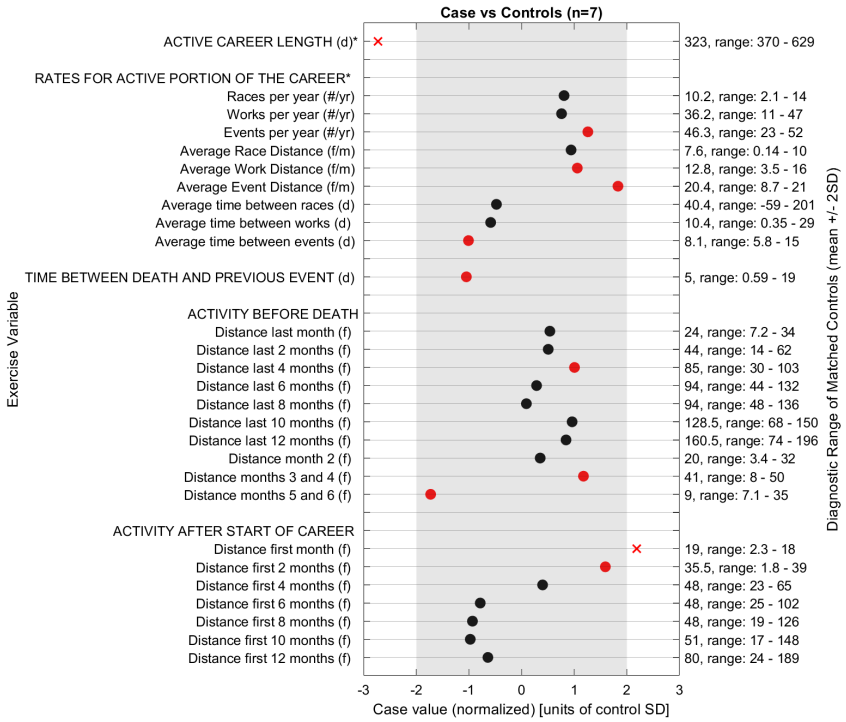
Part 4: Comparison of Exercise Variables between Case Horse and 7 Control Horses (4 year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, female, Thoroughbreds (n=7) (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, female, Thoroughbreds (n=7) (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.

Exercise History Report (Full)
Frigid Lady

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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).

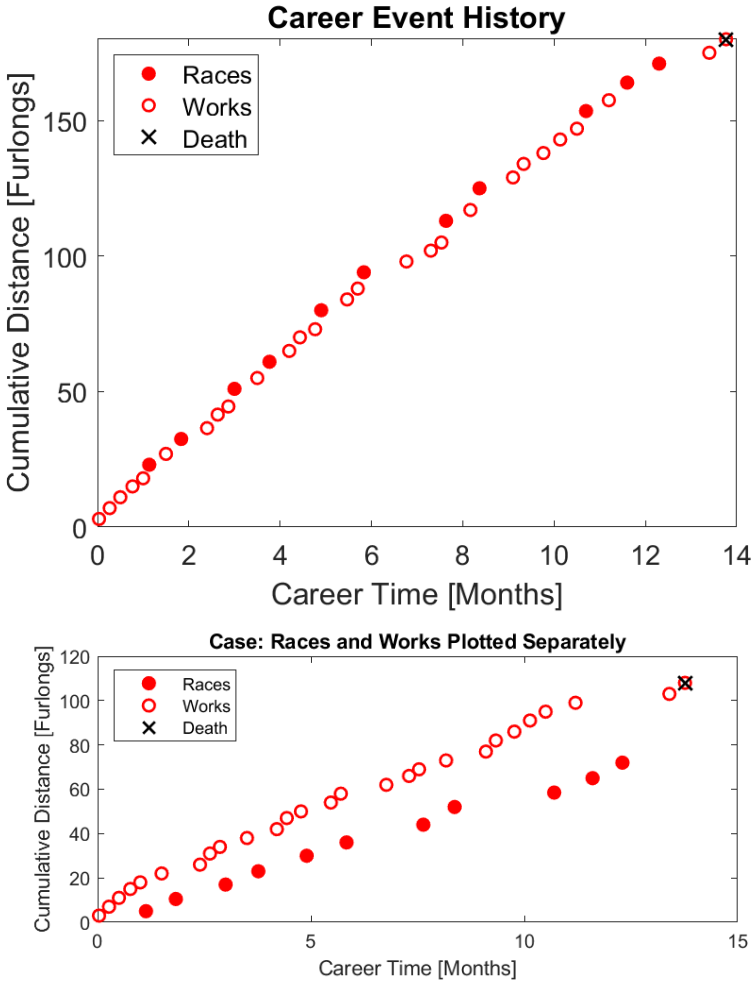
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

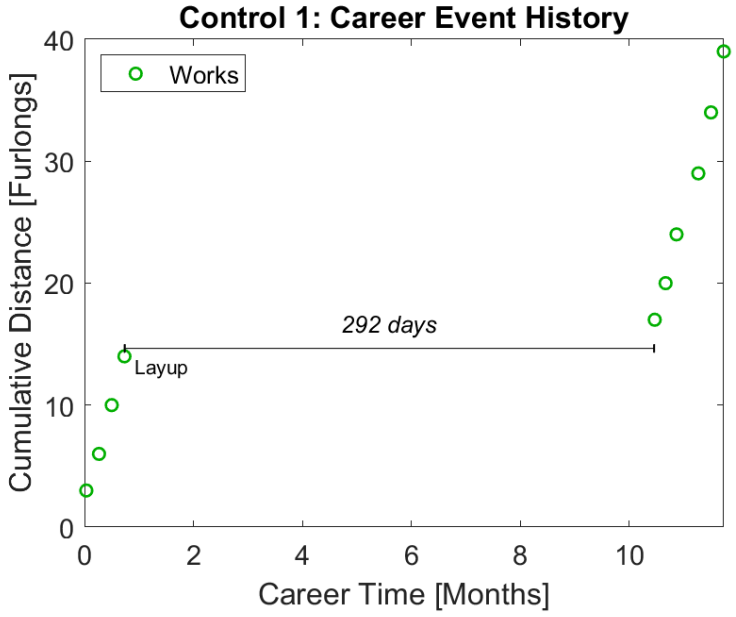
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

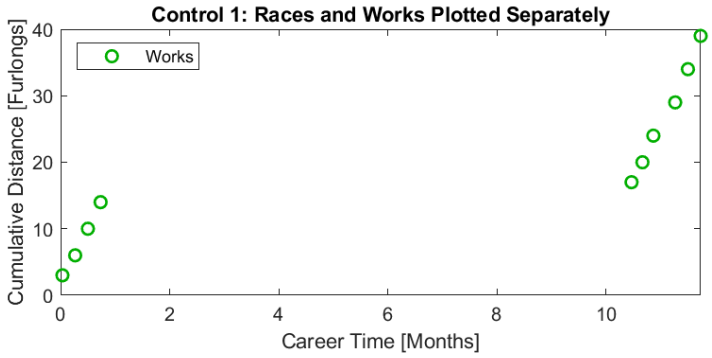
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

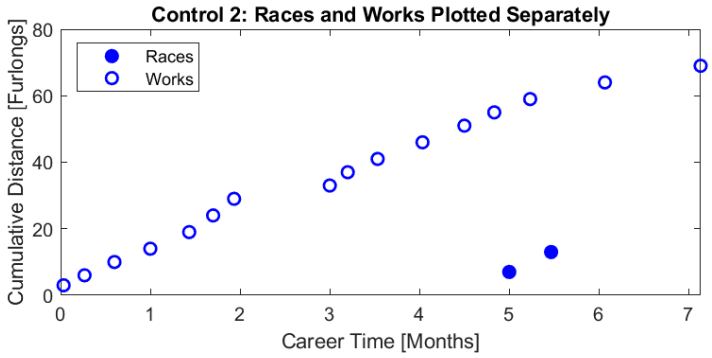


Control 1 High Speed Exercise History

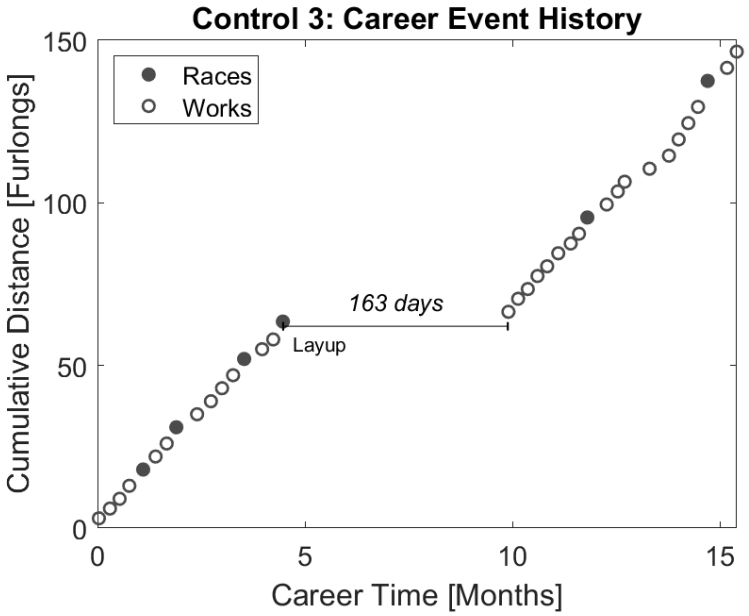


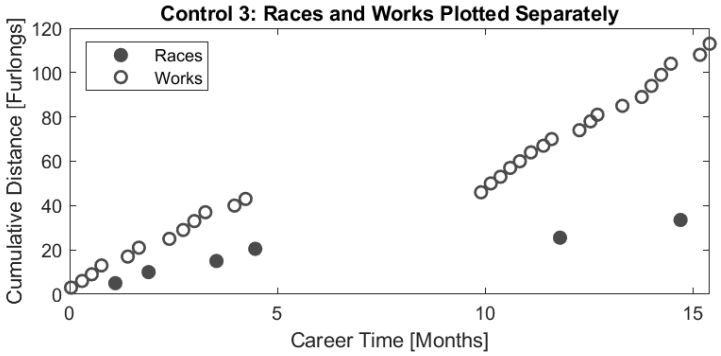


Control 2 High Speed Exercise History

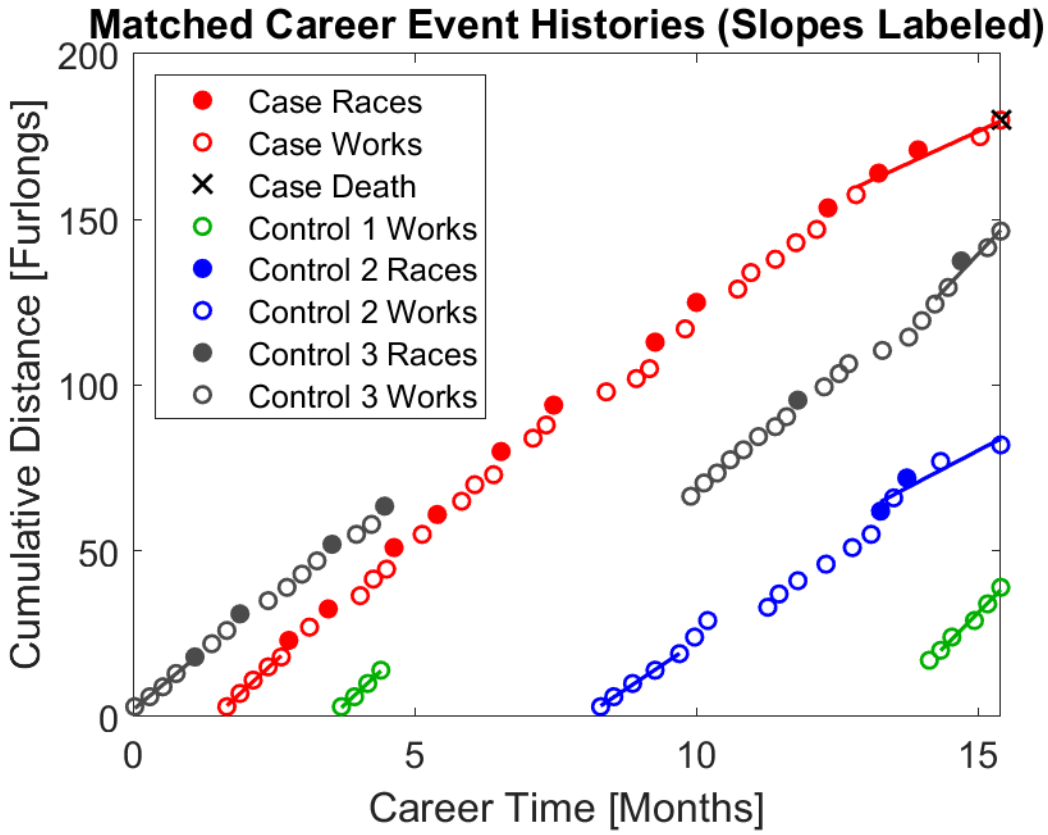


Control 3 High Speed Exercise History

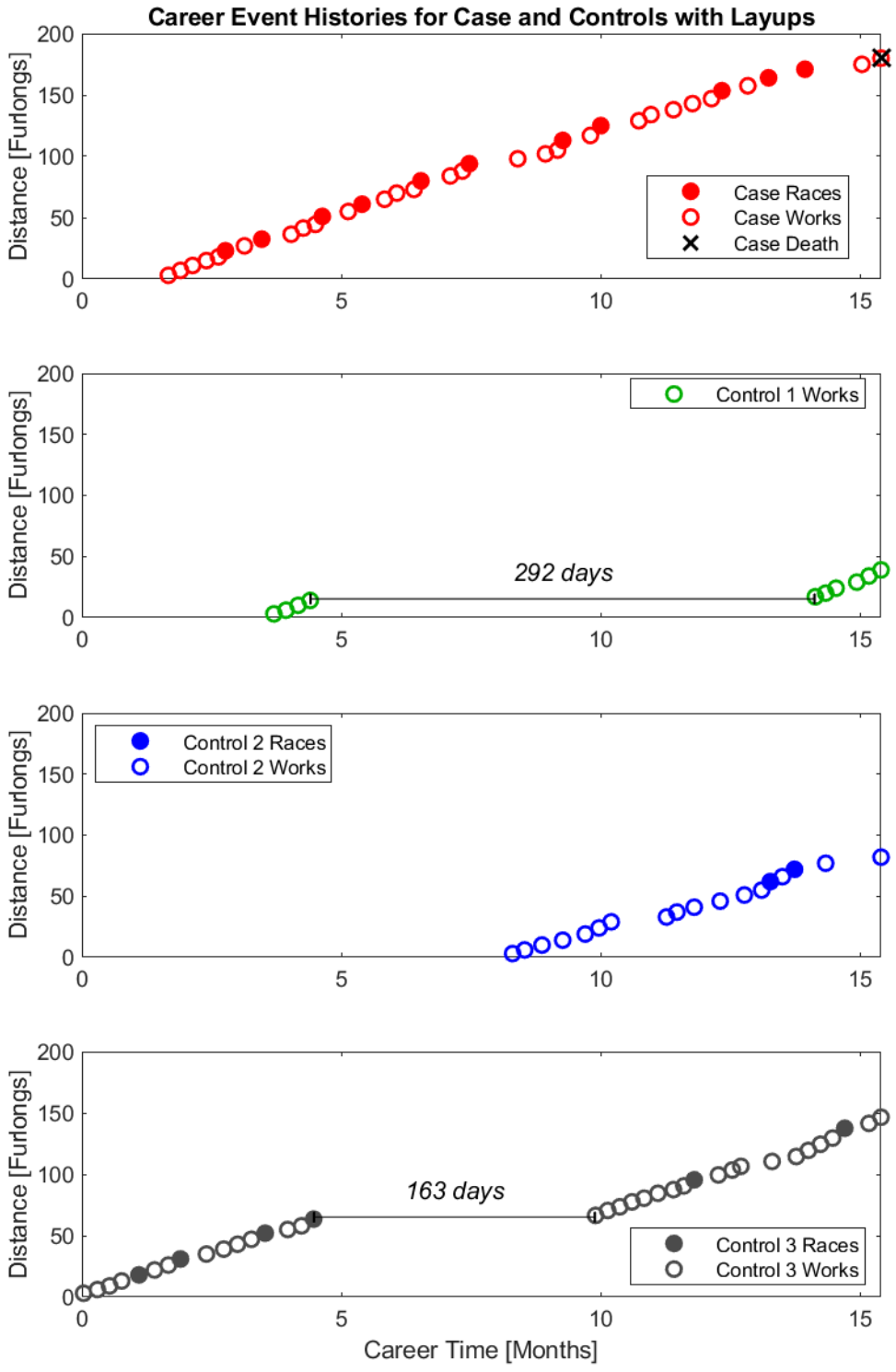


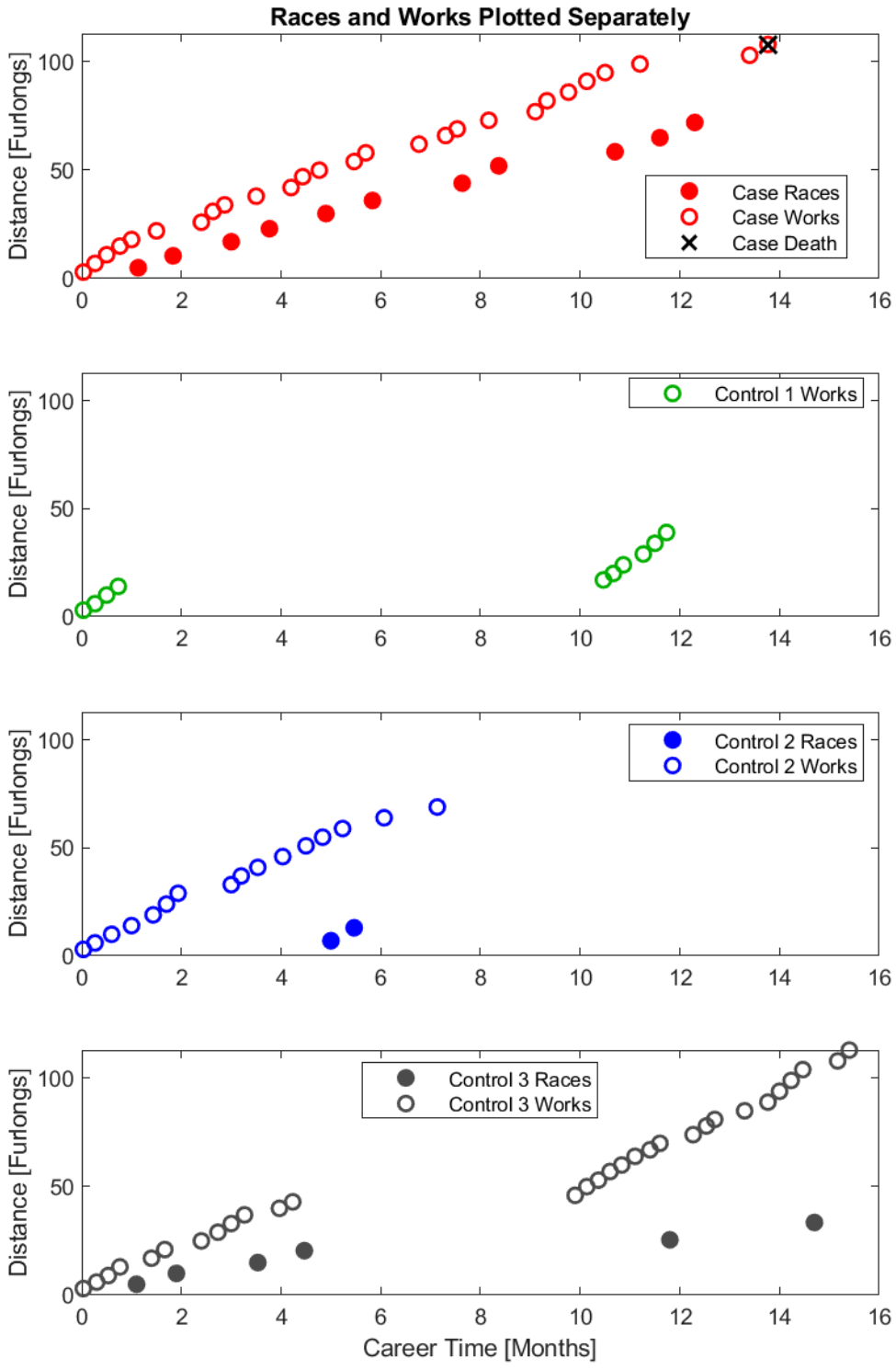


Part 2: Case and Control Horses Plotted Together



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
Control 1 Works
292 days
Control 2 Races
Control 2 Works
163 days
Control 3 Races
Control 3 Works
Career Time [Months]

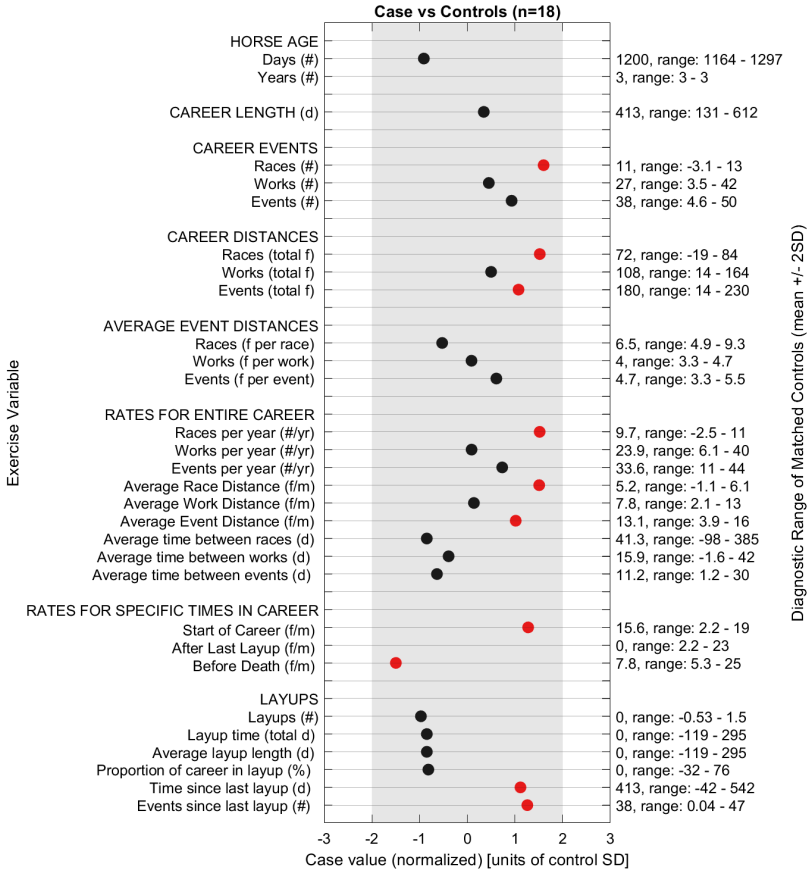

Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
7/15/2023	W	5.0	SAR	Dirt	Fast	01:03.5				
7/4/2023	W	4.0	KEE	All Weather Training	Fast	:49.20				
6/1/2023	R	7.0	CD	Dirt	Fast		3 /F	Str50000nw1/ x	46800	1
5/11/2023	R	6.5	CD	Dirt	Fast		3 /F	Str50000nw1/ x	4140	4
4/29/2023	W	4.0	KEE	Dirt	Fast	:48.60				
4/14/2023	R	6.5	KEE	Dirt	Fast		3 /F	Str50000nw1/ x	1625	5
4/8/2023	W	4.0	KEE	Dirt	Fast	:52.80				
3/28/2023	W	5.0	KEE	Dirt	Fast	01:02.2				
3/17/2023	W	4.0	BEL	Dirt training	Fast	:51.00				
3/4/2023	W	5.0	TP	AllWthr	Fast	01:00.0				
2/25/2023	W	4.0	TP	AllWthr	Fast	:48.80				
2/3/2023	R	8.0	TP	AllWthr	Fast		3 /F	Aoc50000nw1/ x-N	1850	5
1/28/2023	W	4.0	TP	AllWthr	Fast	:49.60				
1/12/2023	R	8.0	TP	AllWthr	Fast		3 /F	Aoc50000nw1/ x-N	14800	2
1/9/2023	W	3.0	CDT	Dirt	Fast	:37.80				
1/2/2023	W	4.0	CDT	Dirt	Muddy	:49.40				
12/17/2022	W	4.0	CDT	Dirt	Fast	:49.40				
11/19/2022	R	6.0	CD	Dirt	Fast		2 /F	Str50000nw1/ x	16560	2
11/15/2022	W	4.0	TP	AllWthr	Fast	:48.80				
11/8/2022	W	4.0	TP	AllWthr	Fast	:51.00				
10/22/2022	R	7.0	KEE	Dirt	Fast		2 /F	Mcl150000	39572	1
10/18/2022	W	3.0	CDT	Dirt	Fast	:36.80				
10/8/2022	W	5.0	CDT	Dirt	Fast	01:01.8				
10/1/2022	W	4.0	CDT	Dirt	Fast	:49.80				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
9/18/2022	R	6.0	CD	Dirt	Fast		2 /F	Mcl50000-c	13340	2
9/10/2022	W	4.0	CD	Dirt	Fast	:50.00				
8/26/2022	R	6.5	ELP	Dirt	Fast		2 /F	Msw	6000	3
8/22/2022	W	3.0	ELP	Dirt	Fast	:38.00				
8/15/2022	W	5.0	ELP	Dirt	Fast	01:01.4				
8/8/2022	W	4.0	ELP	Dirt	Fast	:52.20				
7/22/2022	R	5.5	ELP	Dirt	Fast		2 /F	Msw	6000	3
7/12/2022	W	4.0	ELP	Dirt	Fast	:51.80				
7/1/2022	R	5.0	CD	Dirt	Fast		2 /F	Msw	6000	4
6/27/2022	W	3.0	CD	Dirt	Fast	:38.40				
6/20/2022	W	4.0	CD	Dirt	Fast	:49.20				
6/12/2022	W	4.0	LS	Dirt	Fast	:49.71				
6/5/2022	W	4.0	LS	Dirt	Fast	:49.02				
5/29/2022	W	3.0	LS	Dirt	Fast	:37.87				

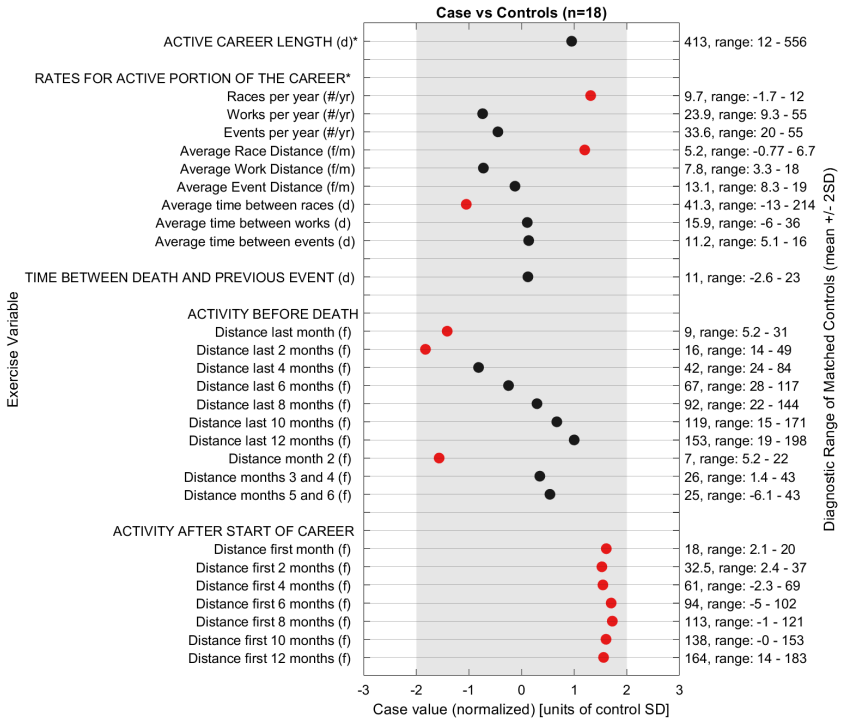
Part 4: Comparison of Exercise Variables between Case Horse and 18 Control Horses (3 year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, female, Thoroughbreds (n=18) (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 3 year old, female, Thoroughbreds (n=18) (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.

Exercise History Report (Full)
La Aguililla

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

Sep-25-2023

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).

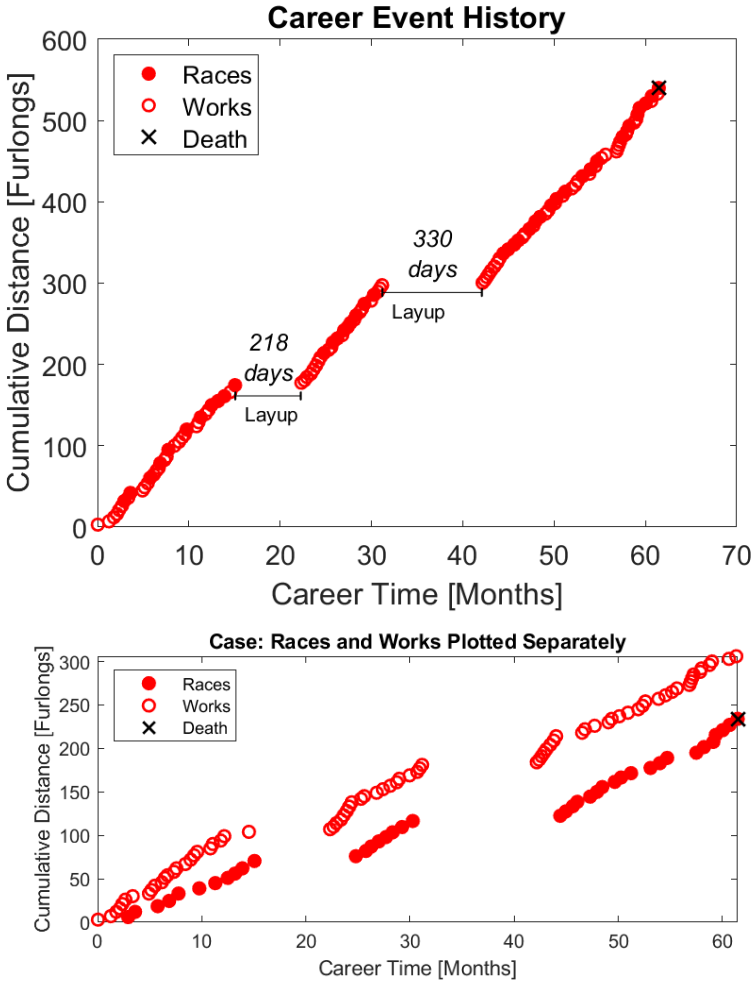
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

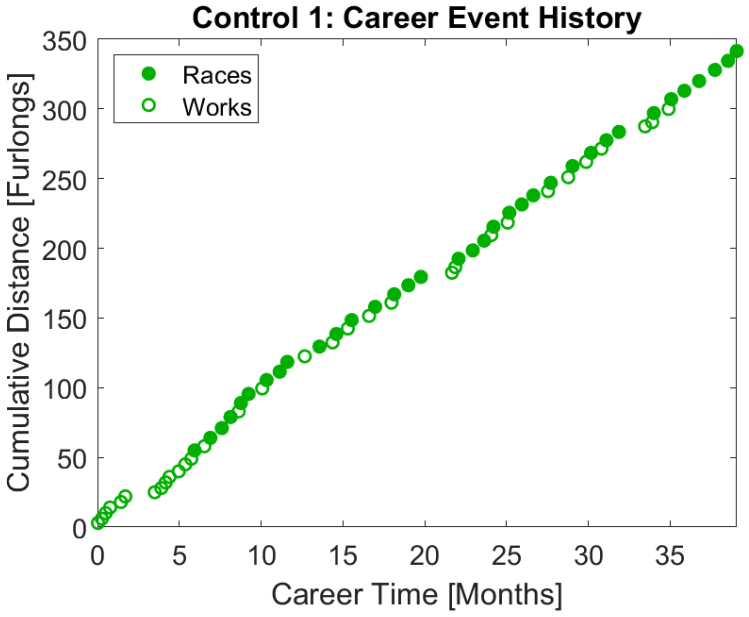
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

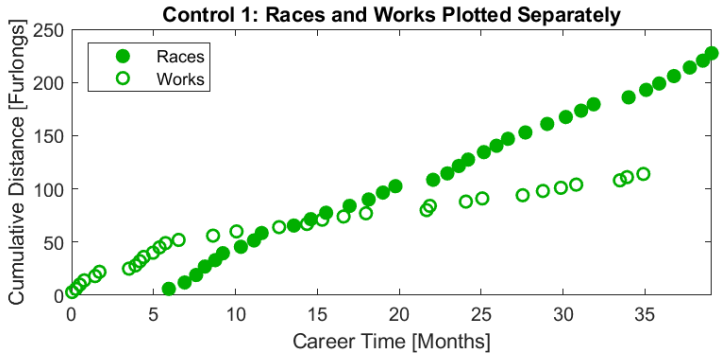
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

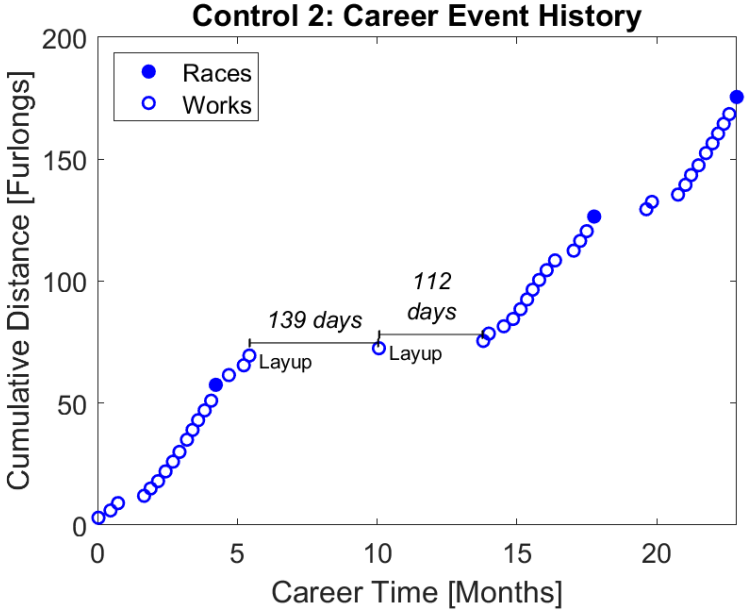


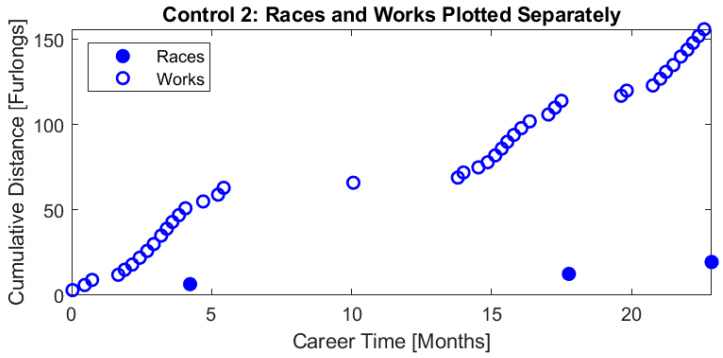
Control 1 High Speed Exercise History



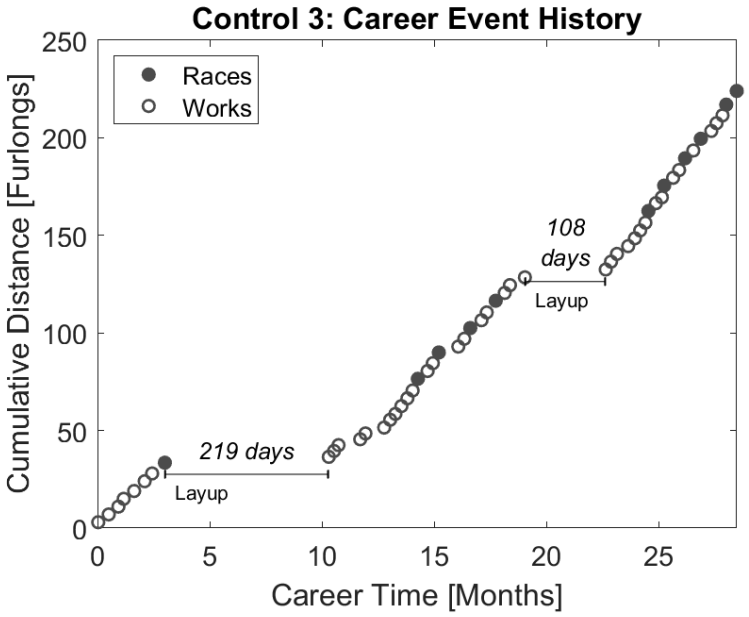


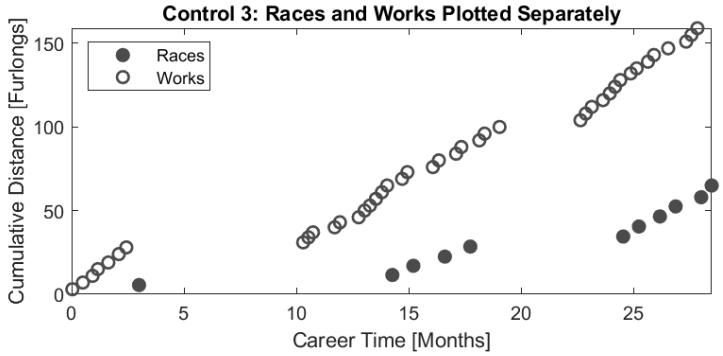
Control 2 High Speed Exercise History



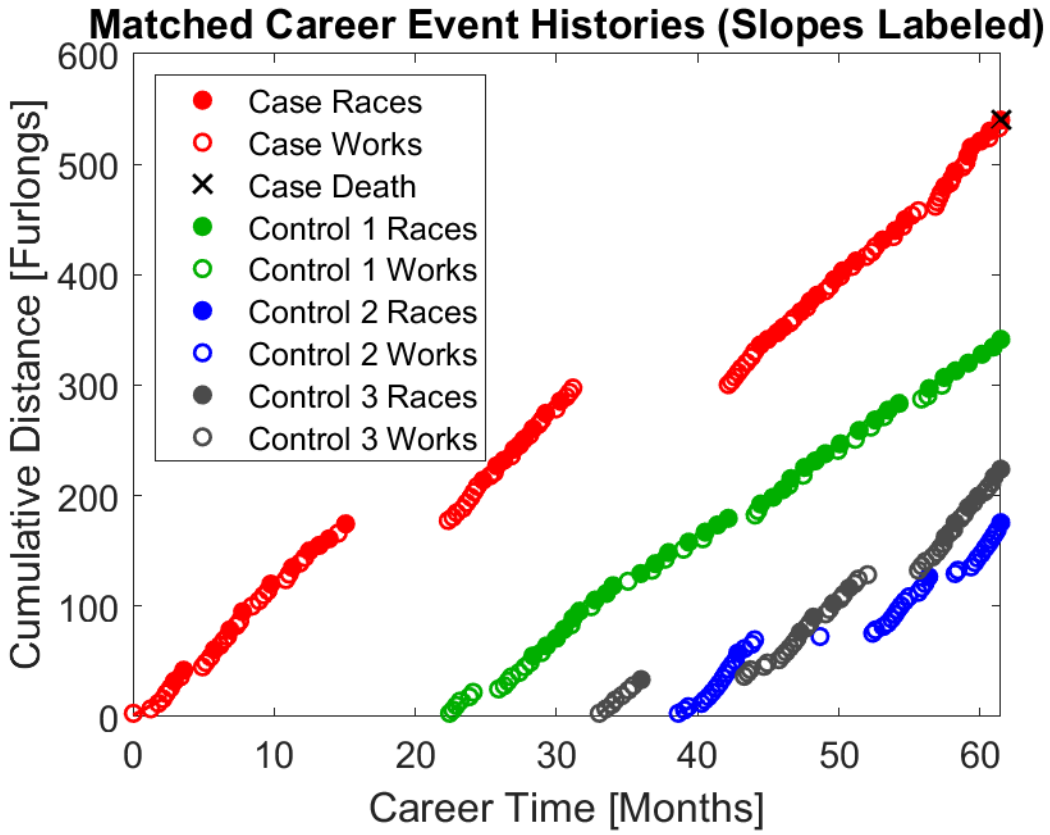


Control 3 High Speed Exercise History

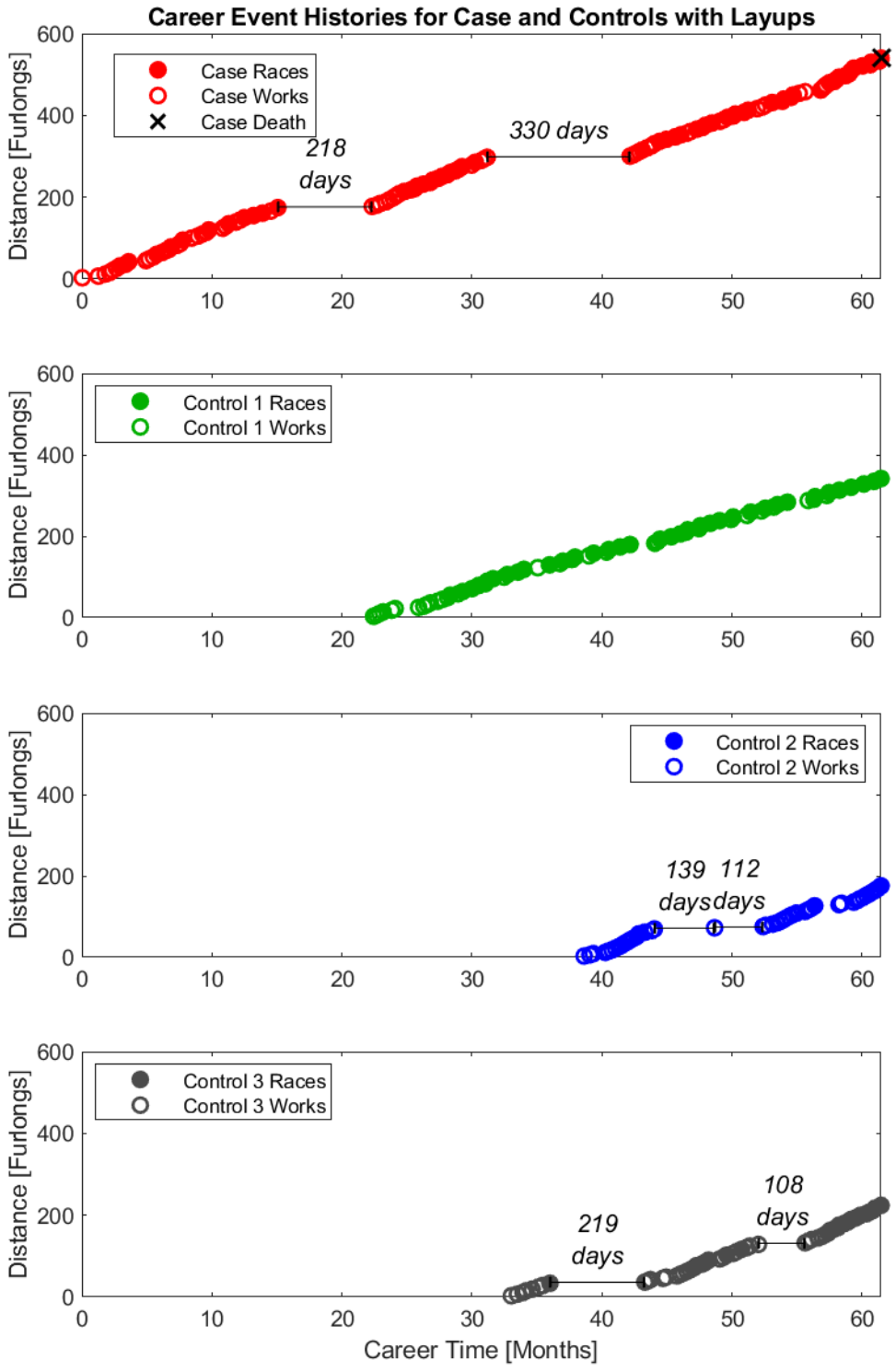


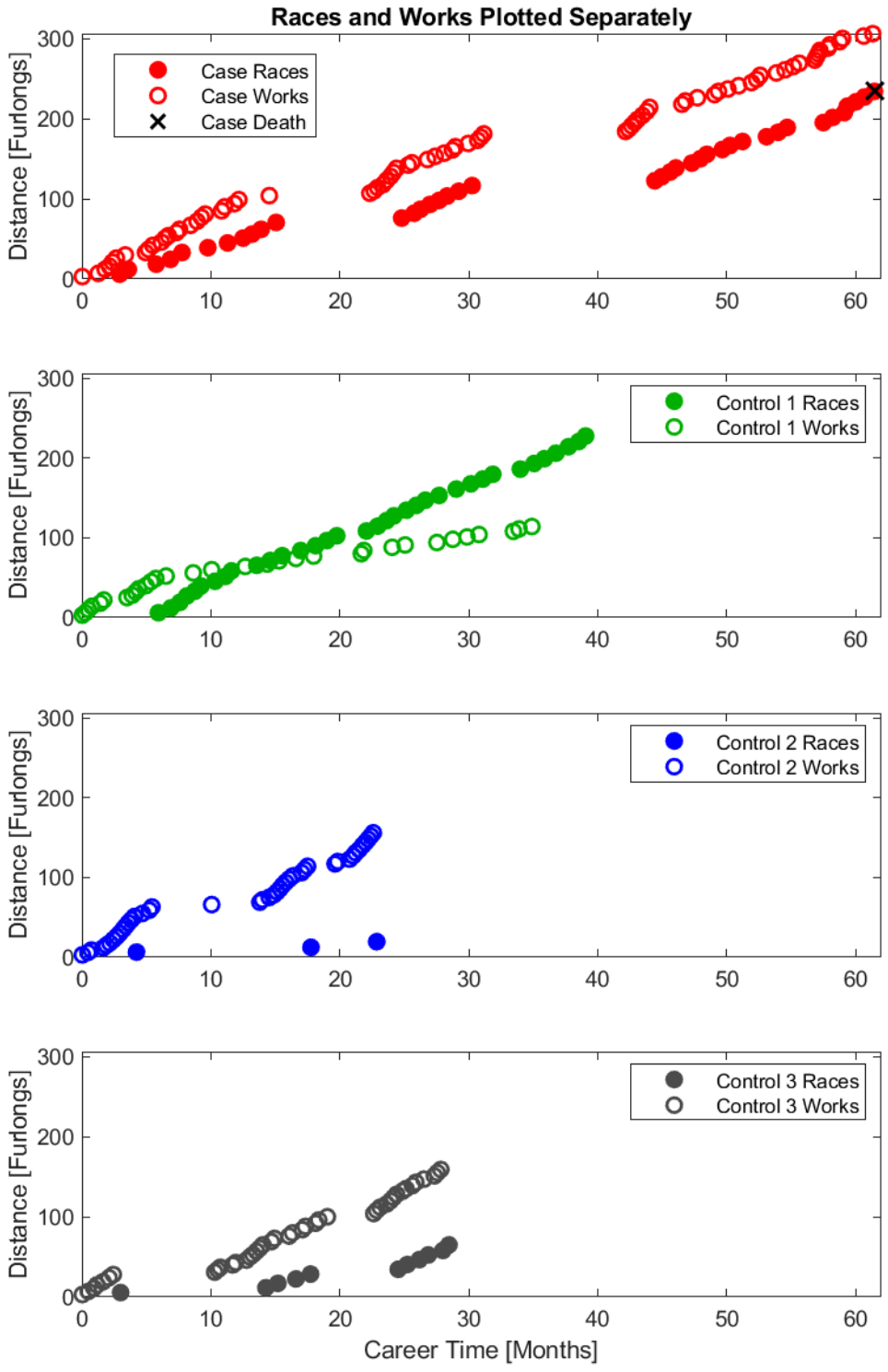


Part 2: Case and Control Horses Plotted Together



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
218 days
330 days
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
139 days
112 days
Control 3 Races
Control 3 Works
219 days
108 days
Career Time [Months]


Races and Works Plotted Separately
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Distance [Furlongs]
Career Time [Months]
0
100
200
300
10
20
30
40
50
60

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/25/2023	R	7.0	SAR	Dirt	Muddy		3U / FM	Clm16000nw2/ L	1400	5
8/21/2023	W	3.0	SAR	Dirt	Fast	:39.99				
8/2/2023	R	6.0	SAR	Dirt	Fast		3U / FM	Clm16000nw2/ L	7000	2
7/31/2023	W	3.0	SAR	Dirt	Fast	:38.89				
7/13/2023	R	5.5	SAR	Turf	Firm		3U / FM	Clm35000nw2/ L	375	6
6/23/2023	R	8.0	BEL	Dirt	Fast		3U / FM	Clm40000nw2/ L	5400	3
6/16/2023	R	6.0	BEL	Dirt	Muddy		3U / FM	Str50000nw1/ x	488	7
6/12/2023	W	4.0	BEL	Dirt training	Fast	:51.67				
6/5/2023	W	4.0	BEL	Dirt training	Fast	:50.69				
5/20/2023	R	6.5	BEL	Dirt	Sloppy		3U / FM	Str50000nw1/ x	3900	4
5/13/2023	W	4.0	BEL	Dirt training	Fast	:51.00				
5/9/2023	W	3.0	BEL	Dirt training	Fast	:39.20				
4/28/2023	R	6.0	AQU	Turf	Firm		3U / FM	Str50000nw1/ x	6600	3
4/20/2023	W	4.0	BEL	Dirt training	Fast	:51.85				
4/16/2023	W	4.0	BEL	Dirt training	Fast	:54.00				
4/12/2023	W	4.0	BEL	Dirt training	Fast	:51.66				
4/8/2023	W	4.0	BEL	Dirt training	Fast	:49.98				
3/3/2023	W	4.0	SA	Dirt	Fast	:47.40				
2/17/2023	W	4.0	SA	Dirt	Fast	:48.00				

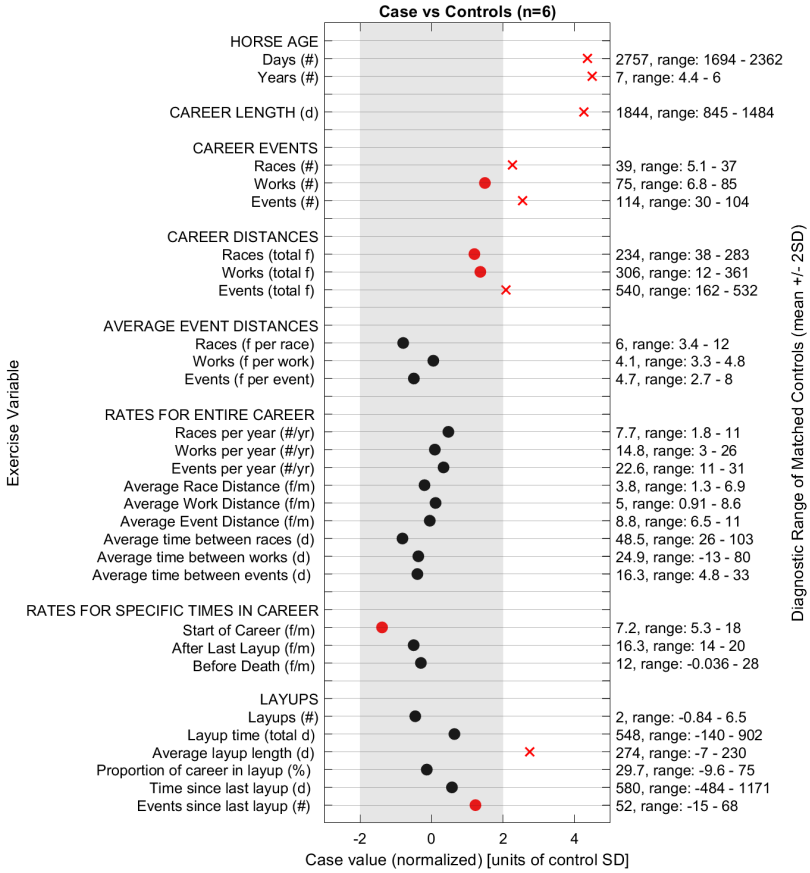
Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
2/3/2023	R	6.0	SA	Turf	Firm		4U / FM	Clm32000 (32-28)nw2/L	7400	2
1/29/2023	W	4.0	SA	Dirt	Fast	:47.40				
1/13/2023	R	5.5	SA	Turf	Good		4U / FM	SOC 50000/50000	500	6
1/9/2023	W	3.0	SA	Dirt	Fast	:36.40				
12/17/2022	R	6.0	LRC	Dirt	Fast		3U / FM	(S) Aoc20000nw1$/ x-N	960	5
12/2/2022	W	5.0	SA	Dirt	Fast	01:00.4				
11/24/2022	W	4.0	SA	Dirt	Fast	:49.00				
11/12/2022	W	4.0	SA	Dirt	Fast	:46.80				
10/22/2022	R	5.0	GG	Turf	Firm		3U / FM	Aoc25000nw1$/ x-N	450	9
10/13/2022	W	4.0	GG	AllWthr	Fast	:46.80				
9/23/2022	R	5.0	GG	Turf	Firm		3U / FM	Aoc25000nw1$/ x-N	4836	3
9/18/2022	W	3.0	GG	AllWthr	Fast	:38.00				
9/5/2022	R	6.0	GG	AllWthr	Fast		3U / FM	Alw31000nw1$/ x	806	5
8/27/2022	W	4.0	GG	AllWthr	Fast	:49.20				
8/18/2022	W	4.0	GG	AllWthr	Fast	:48.60				
7/31/2022	R	5.5	SAC	Dirt	Fast		3U / FM	Aoc25000nw1$/ x-N	4212	3
7/16/2022	R	5.5	SAC	Dirt	Fast		3U / FM	Alw27000nw1$/ x	4212	3
7/9/2022	W	4.0	SAC	Dirt	Fast	:48.20				
6/26/2022	R	6.0	PLN	Dirt	Fast		3U / FM	Alw27000nw1$/ x	7020	2
6/11/2022	W	4.0	GG	AllWthr	Fast	:50.80				
6/3/2022	W	4.0	GG	AllWthr	Fast	:49.60				
5/20/2022	R	5.0	GG	Turf	Firm		3U / FM	Alw33000	5148	3
5/7/2022	R	6.0	GG	AllWthr	Fast		3U / FM	Alw31000nw1$/ x	450	7

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
4/17/2022	R	5.0	GG	Turf	Firm		4U / FM	Alw31000nw1$/x	4836	3
4/1/2022	R	6.0	GG	AllWthr	Fast		4U / FM	Alw31000nw1$/x	450	7
3/20/2022	W	5.0	GG	AllWthr	Fast	01:02.0				
3/13/2022	W	5.0	GG	AllWthr	Fast	01:01.4				
3/3/2022	W	5.0	GG	AllWthr	Fast	01:00.4				
2/20/2022	W	4.0	GG	AllWthr	Fast	:47.60				
2/13/2022	W	4.0	GG	AllWthr	Fast	:52.60				
2/6/2022	W	4.0	GG	AllWthr	Fast	:52.20				
1/30/2022	W	3.0	GG	AllWthr	Fast	:38.20				
1/23/2022	W	3.0	GG	AllWthr	Fast	:37.80				
2/27/2021	W	4.0	SA	Dirt	Fast	:50.80				
2/20/2021	W	4.0	SA	Dirt	Fast	:48.00				
2/13/2021	W	4.0	SA	Dirt	Fast	:49.20				
1/31/2021	R	7.0	SA	Dirt	Fast		4U / FM	(S) Aoc20000nw1$/x-N	500	7
1/22/2021	W	4.0	SA	Dirt	Fast	:48.20				
12/31/2020	R	6.0	SA	Turf	Firm		3U / FM	(S) Alw63000nw1$/x	12600	2
12/23/2020	W	4.0	SA	Dirt	Fast	:50.00				
12/16/2020	W	4.0	SA	Dirt	Fast	:49.00				
12/4/2020	R	5.5	LRC	Dirt	Fast		3U / FM	(S) Aoc20000nw1$/x-N	9600	2
11/27/2020	W	4.0	SA	Dirt	Fast	:47.80				
11/15/2020	R	5.0	DMR	Turf	Firm		3U / FM	(S) Aoc20000nw1$/x-N	7080	3
11/6/2020	W	4.0	SA	Dirt	Fast	:49.20				
10/25/2020	R	6.0	SA	Dirt	Fast		3U / FM	(S) Aoc20000nw1$/x-N	500	6

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
10/19/2020	W	4.0	SA	Dirt	Fast	:49.20				
10/3/2020	R	5.0	GG	Turf	Firm		3U / FM	Alw31000nw1$x	8060	2
9/18/2020	R	6.0	GG	AllWthr	Fast		3U / FM	Alw31000nw1$x	2418	4
9/13/2020	W	3.0	GG	AllWthr	Fast	:37.00				
9/4/2020	W	4.0	GG	AllWthr	Fast	:48.20				
8/20/2020	R	5.5	GG	AllWthr	Fast		3U / FM	Alw31000nw1$x	4836	3
8/8/2020	W	5.0	GG	AllWthr	Fast	:59.20				
8/1/2020	W	5.0	GG	AllWthr	Fast	01:02.6				
7/25/2020	W	5.0	GG	AllWthr	Fast	01:02.0				
7/16/2020	W	5.0	GG	AllWthr	Fast	01:00.6				
7/8/2020	W	4.0	GG	AllWthr	Fast	:49.20				
6/25/2020	W	4.0	GG	AllWthr	Fast	:49.40				
6/17/2020	W	3.0	GG	AllWthr	Fast	:37.80				
6/7/2020	W	3.0	GG	AllWthr	Fast	:37.20				
11/2/2019	R	8.5	GG	AllWthr	Fast		3U / FM	Aoc25000nw1$x-N	300	7
10/17/2019	W	5.0	GG	AllWthr	Fast	01:00.6				
9/28/2019	R	6.0	GG	AllWthr	Fast		3U / FM	Alw31000nw1$x	4836	3
9/7/2019	R	5.0	GG	Turf	Firm		3U / FM	Alw31000nw1$x	300	7
8/17/2019	R	6.0	GG	AllWthr	Fast		3U / FM	Alw31000nw1$x	300	6
8/7/2019	W	5.0	GG	AllWthr	Fast	01:01.6				
7/28/2019	W	4.0	GG	AllWthr	Fast	:48.00				
7/12/2019	R	6.0	SAC	Dirt	Fast		3 /F	Aoc40000nw1$x-N	7020	2
7/5/2019	W	5.0	GG	AllWthr	Fast	01:01.2				
6/28/2019	W	4.0	GG	AllWthr	Fast	:49.20				
5/27/2019	R	6.0	GG	AllWthr	Fast		3 /F	Aoc40000nw1$x-N	4836	3
5/21/2019	W	4.0	GG	AllWthr	Fast	:48.80				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
5/12/2019	W	5.0	GG	AllWthr	Fast	01:02.0				
5/2/2019	W	5.0	GG	AllWthr	Fast	01:00.4				
4/17/2019	W	5.0	GG	AllWthr	Fast	01:01.2				
3/28/2019	R	8.5	GG	AllWthr	Fast		3 /F	Aoc40000nw1$/ x-N	300	7
3/22/2019	W	4.0	GG	AllWthr	Fast	:49.00				
3/15/2019	W	4.0	GG	AllWthr	Fast	:50.20				
3/1/2019	R	6.0	GG	AllWthr	Fast		3 /F	Aoc40000nw1$/ x-N	2418	4
2/24/2019	W	3.0	SA	Dirt	Fast	:37.40				
2/17/2019	W	5.0	SA	Dirt	Fast	01:01.4				
2/8/2019	W	4.0	SA	Dirt	Fast	:49.80				
1/27/2019	R	6.5	SA	Dirt	Fast		3 /F	(S) Aoc50000nw1$/ x-N	6840	3
1/19/2019	W	5.0	SA	Dirt	Fast	01:01.8				
1/9/2019	W	4.0	SA	Dirt	Fast	:51.20				
1/2/2019	W	3.0	SA	Dirt	Fast	:37.80				
11/23/2018	R	6.0	GG	AllWthr	Fast		2 /F	GGDebtantB -50k	0	10
11/16/2018	W	4.0	GG	AllWthr	Fast	:48.80				
11/3/2018	R	6.0	GG	AllWthr	Fast		2 /F	Msw	20280	1
10/26/2018	W	5.0	GG	AllWthr	Fast	01:03.4				
10/17/2018	W	5.0	GG	AllWthr	Fast	01:04.0				
10/10/2018	W	4.0	GG	AllWthr	Fast	:50.80				
9/30/2018	W	5.0	GG	AllWthr	Fast	01:02.4				
9/14/2018	W	4.0	GG	AllWthr	Fast	:50.00				
8/8/2018	W	3.0	GG	AllWthr	Fast	:40.80				

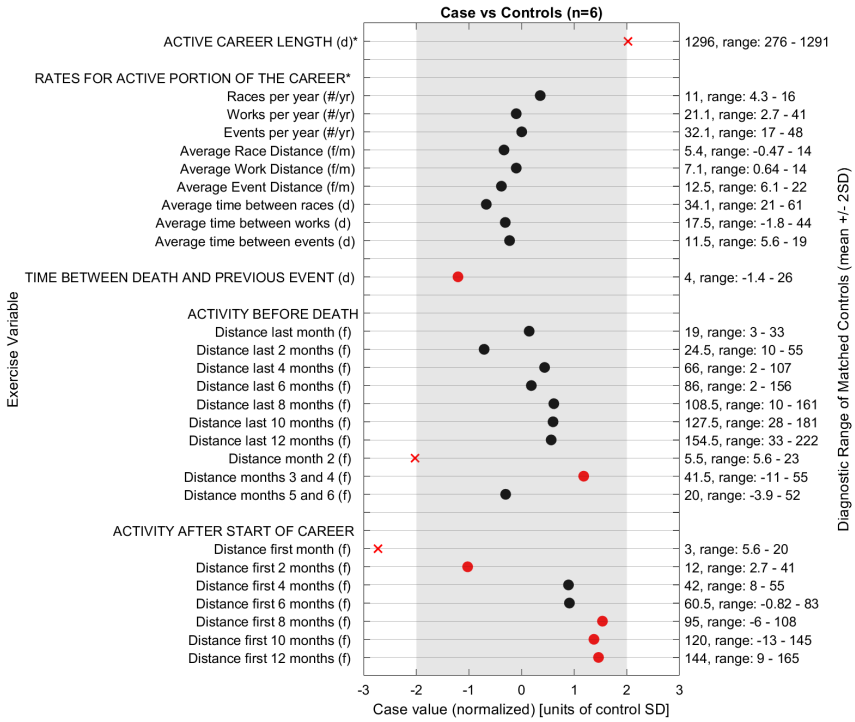
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (5+ year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, female, Thoroughbreds (n=6) (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 5+ year old, female, Thoroughbreds (n=6) (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.

Exercise History Report (Full)
Lawful

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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).

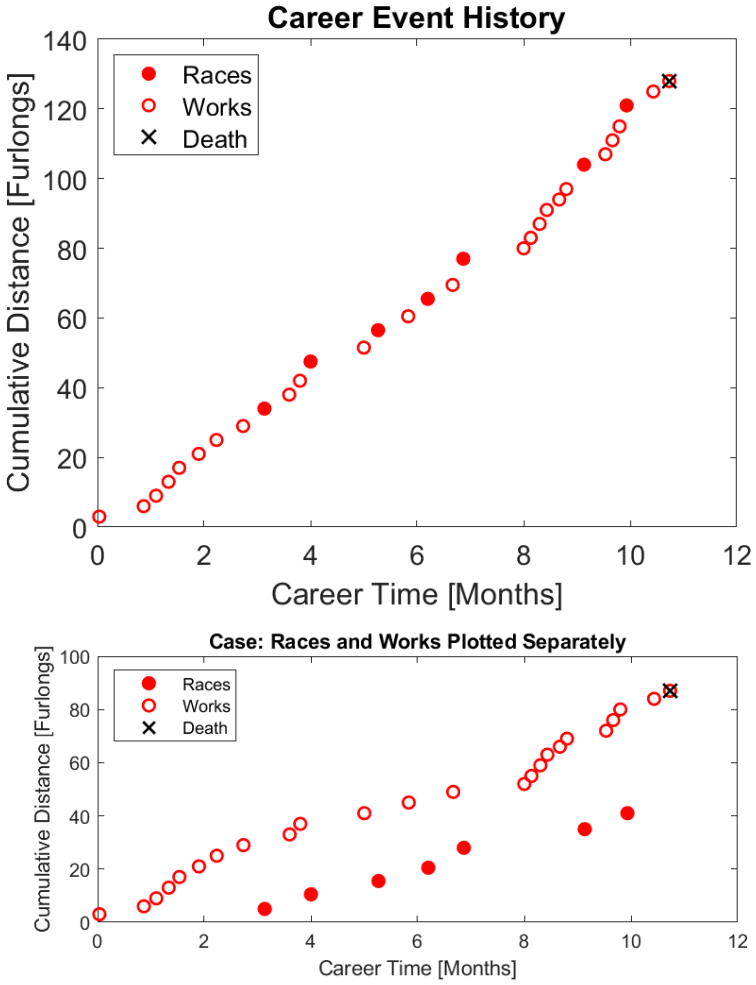
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

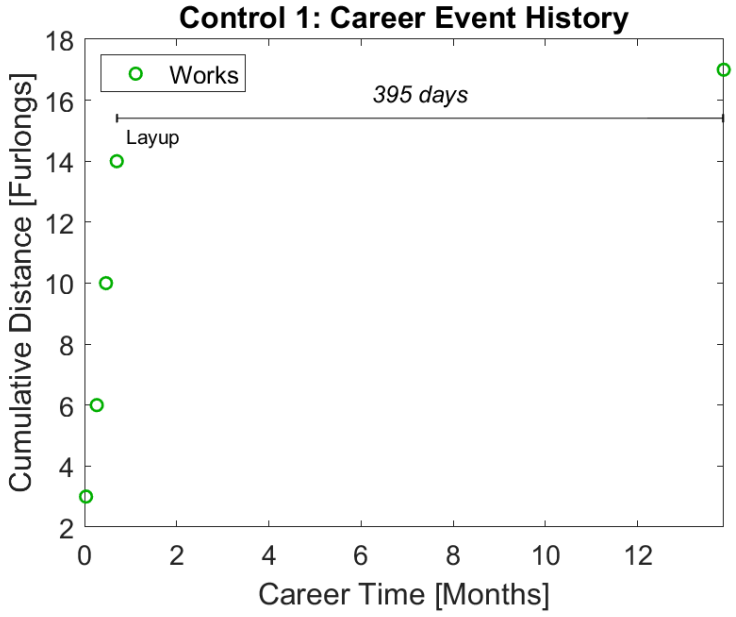
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

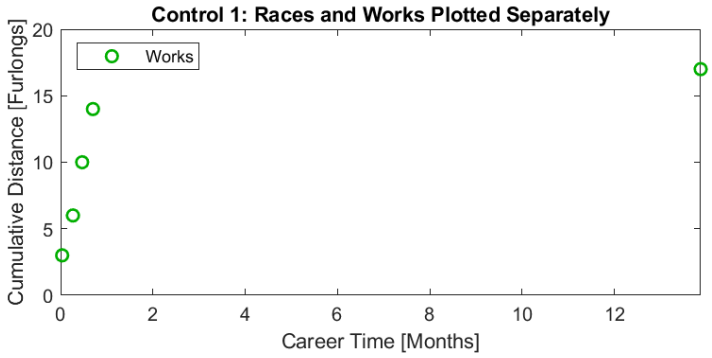
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

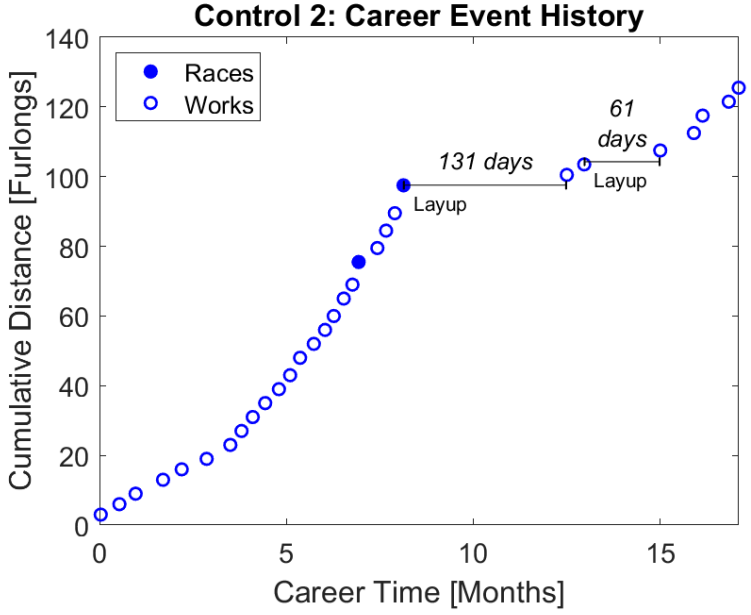


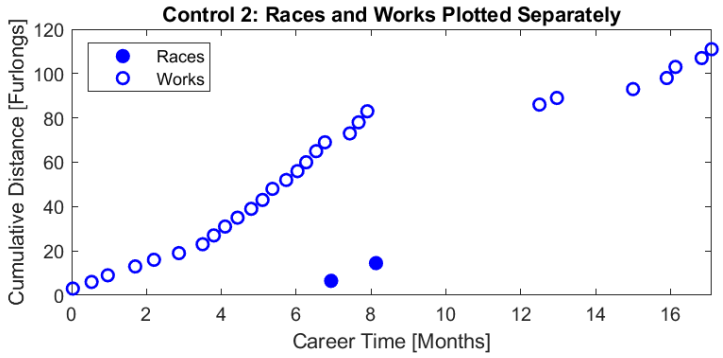
Control 1 High Speed Exercise History



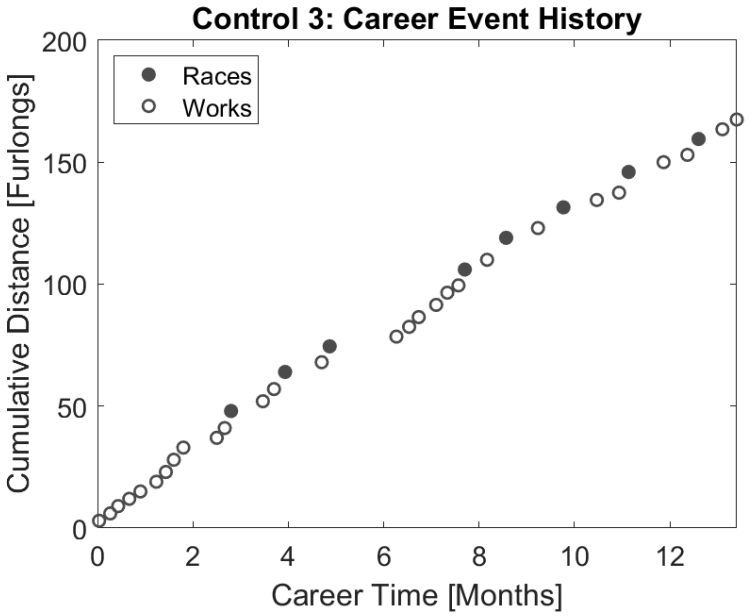


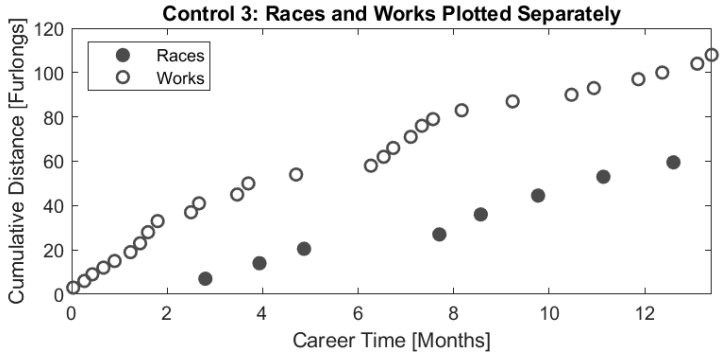
Control 2 High Speed Exercise History



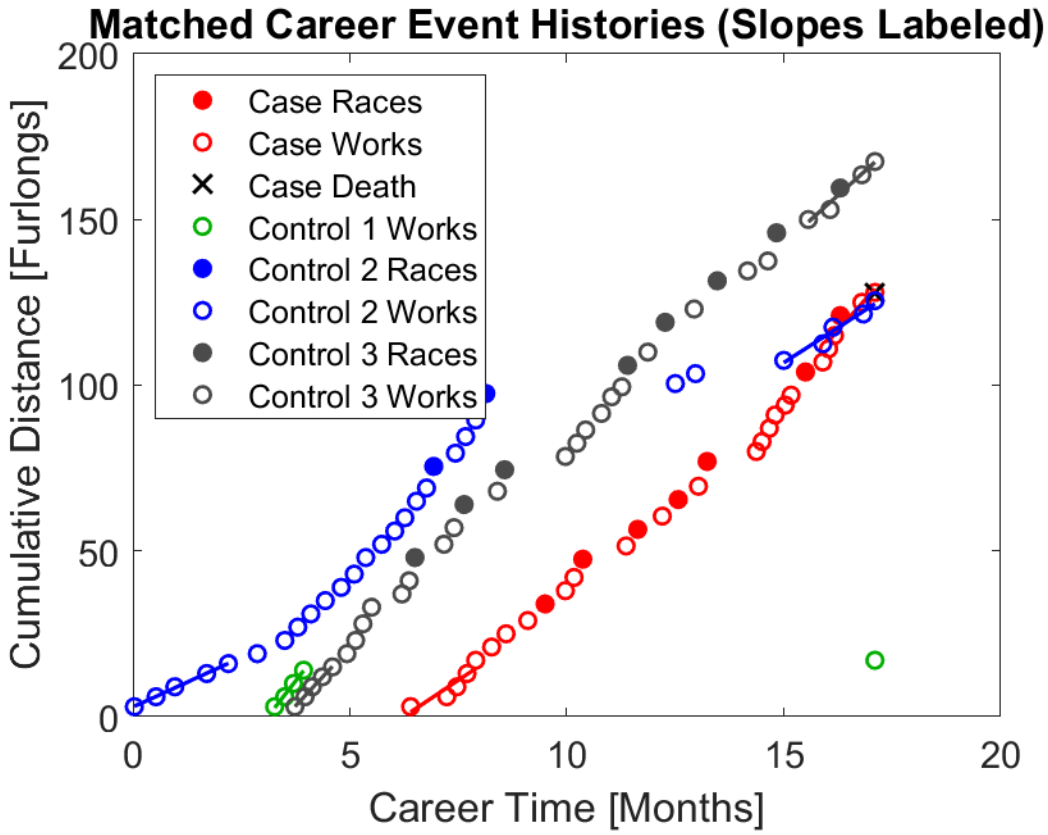


Control 3 High Speed Exercise History

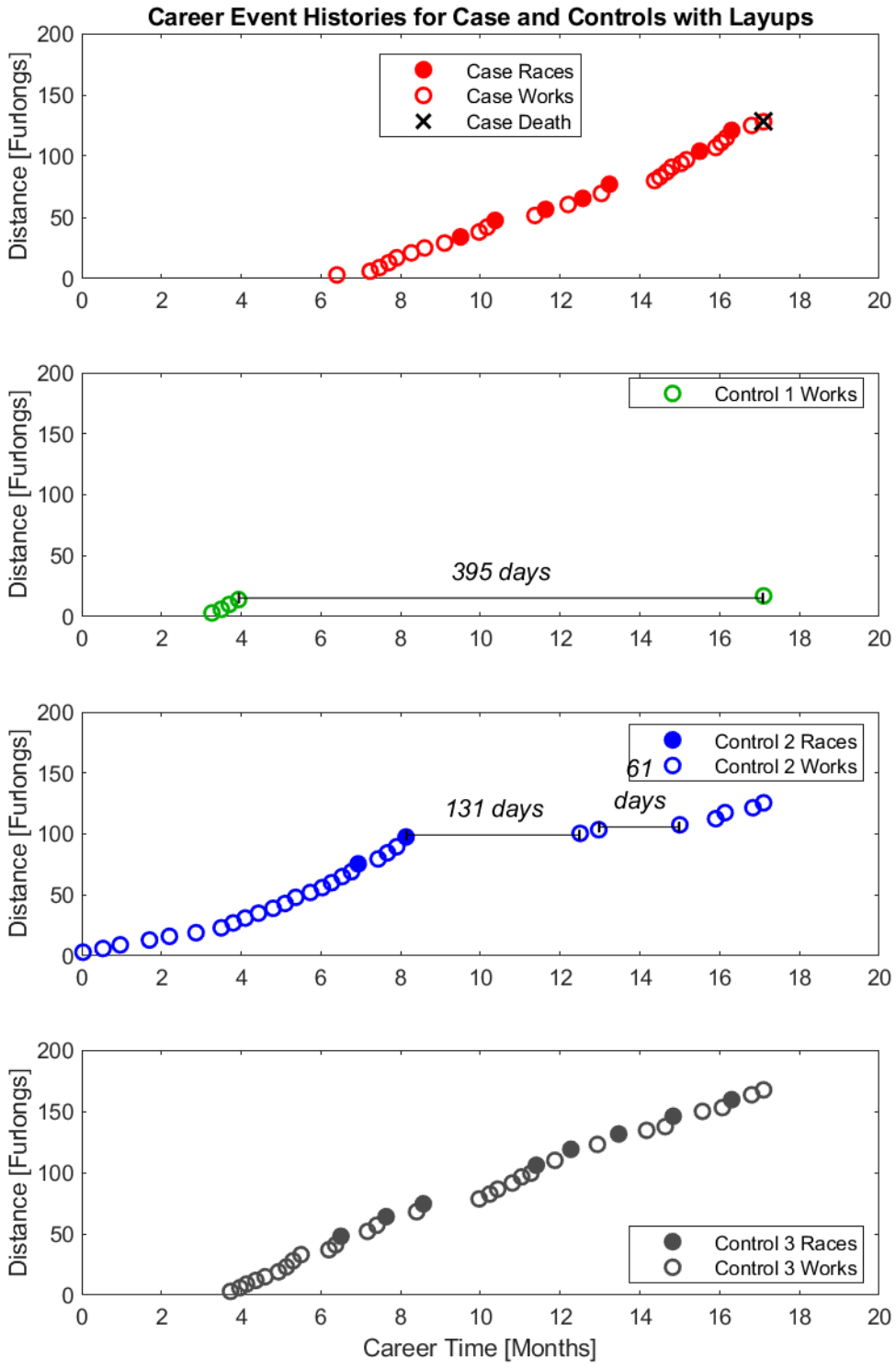


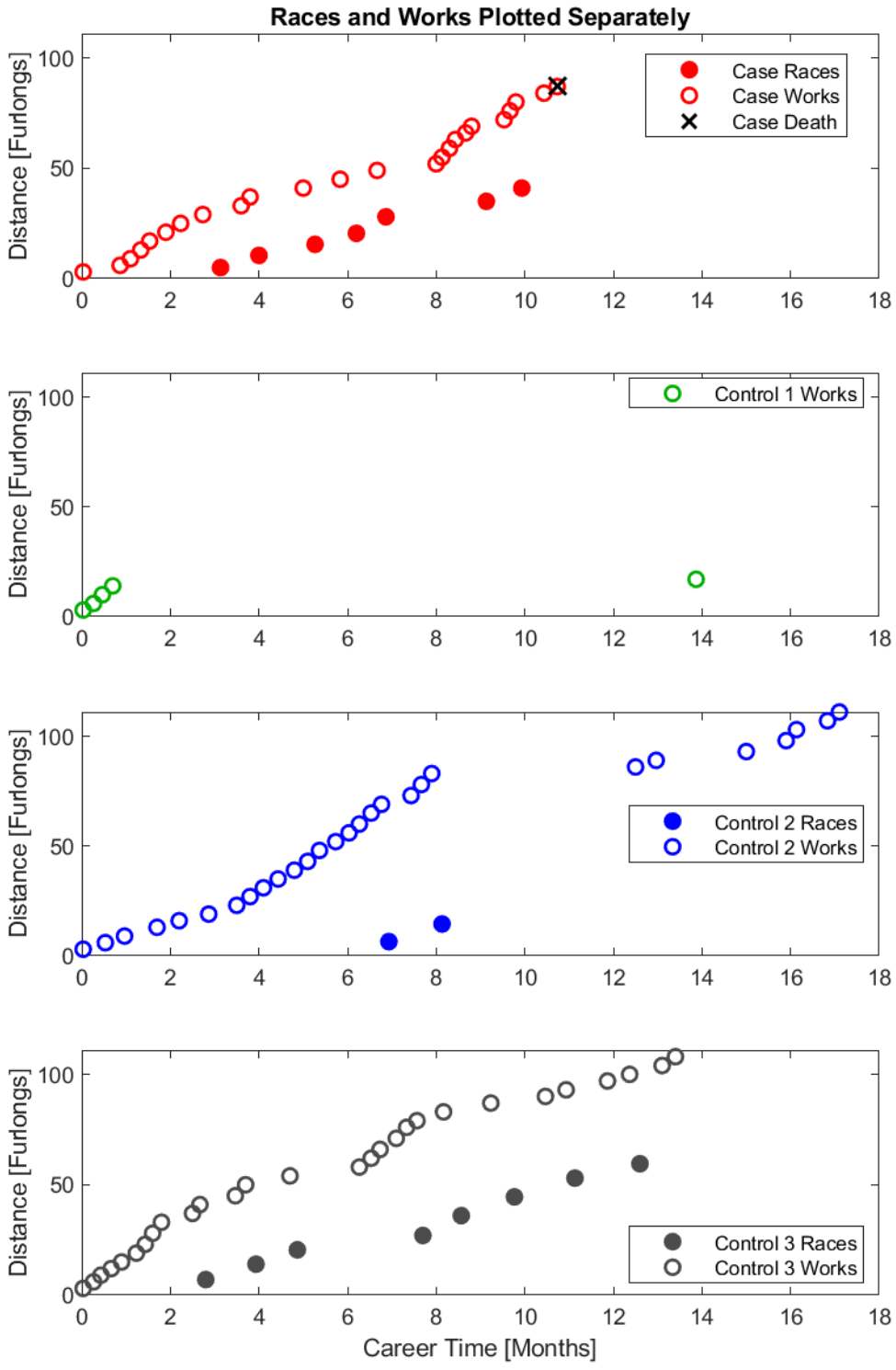


Part 2: Case and Control Horses Plotted Together



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
Control 1 Works
395 days
Control 2 Races
Control 2 Works
61 days
131 days
Control 3 Races
Control 3 Works
Career Time [Months]

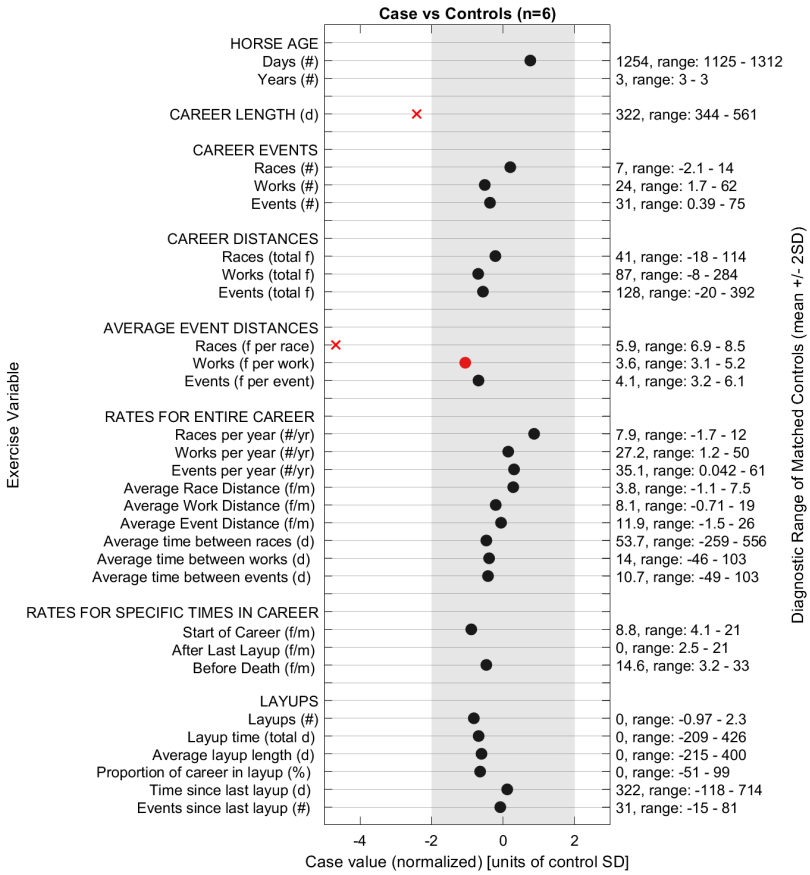

Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/2/2023	W	3.0	SAR	Dirt	Fast	:39.44				
7/24/2023	W	4.0	SAR	Dirt	Fast	:53.00				
7/9/2023	R	6.0	BEL	Turf	Firm		3U	Mcl40000	5640	3
7/5/2023	W	4.0	BEL	Dirt training	Good	:51.15				
7/1/2023	W	4.0	BEL	Dirt training	Fast	:51.00				
6/27/2023	W	3.0	BEL	Dirt training	Fast	:38.85				
6/15/2023	R	7.0	BEL	Turf	Firm		3U	Mcl40000	2820	4
6/5/2023	W	3.0	BEL	Dirt training	Fast	:41.20				
6/1/2023	W	3.0	BEL	Dirt training	Fast	:38.50				
5/25/2023	W	4.0	BEL	Dirt training	Fast	:52.45				
5/21/2023	W	4.0	BEL	Dirt training	Muddy	:51.96				
5/16/2023	W	3.0	BEL	Dirt training	Fast	:38.58				
5/12/2023	W	3.0	BEL	Dirt training	Fast	:39.96				
4/8/2023	R	7.5	GP	Turf	Firm		3	Moc50000cnd-N	400	7
4/2/2023	W	4.0	PMM	Dirt	Wet Fast	:49.35				
3/19/2023	R	5.0	GP	Turf	Firm		3	Msw	7700	3
3/8/2023	W	4.0	PMM	Dirt	Fast	:49.80				
2/19/2023	R	5.0	GP	Turf	Firm		3	Msw	2800	4
2/11/2023	W	4.0	PMM	Turf	Firm	:49.45				
1/12/2023	R	5.5	GP	AllWthr	Fast		3	Moc50000cnd-N	5430	3
1/6/2023	W	4.0	PMM	Dirt	Fast	:51.80				
12/31/2022	W	4.0	PMM	Dirt	Fast	:48.40				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
12/17/2022	R	5.0	GP	AllWthr	Fast		2	Msw	6400	3
12/5/2022	W	4.0	PMM	Dirt	Fast	:48.40				
11/20/2022	W	4.0	KEE	All Weather Training	Fast	:52.80				
11/10/2022	W	4.0	KEE	Dirt	Fast	:48.20				
10/30/2022	W	4.0	KEE	Dirt	Fast	:49.60				
10/24/2022	W	4.0	KEE	Dirt	Fast	:50.20				
10/17/2022	W	3.0	KEE	Dirt	Fast	:37.60				
10/10/2022	W	3.0	KEE	Dirt	Fast	:37.00				
9/15/2022	W	3.0	CDT	Dirt	Fast	:37.80				

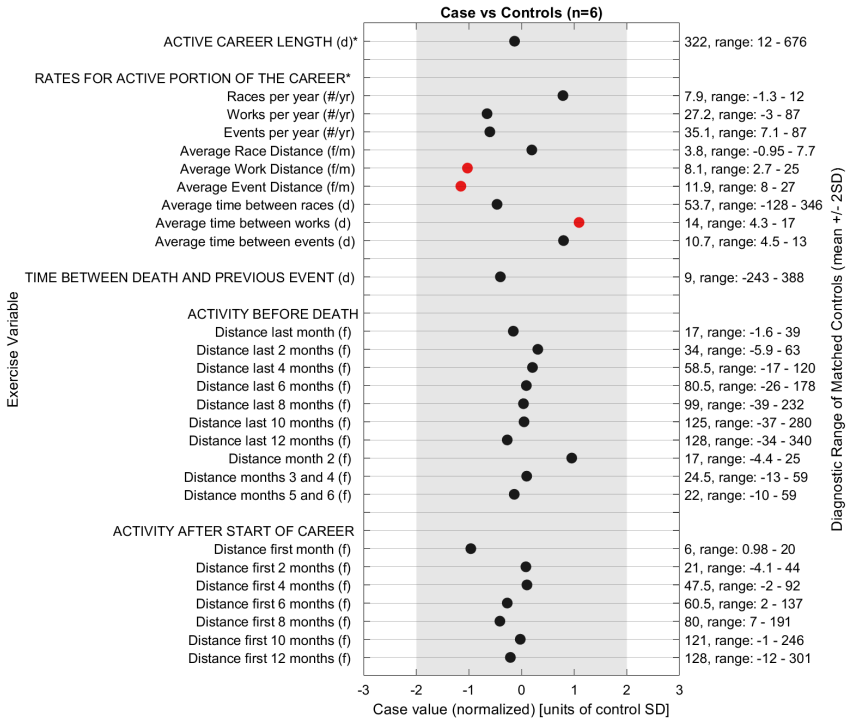
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (3 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, male, Thoroughbreds (n=6) (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 3 year old, male, Thoroughbreds (n=6) (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.

Exercise History Report (Full)
Maple Leaf Mel

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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.

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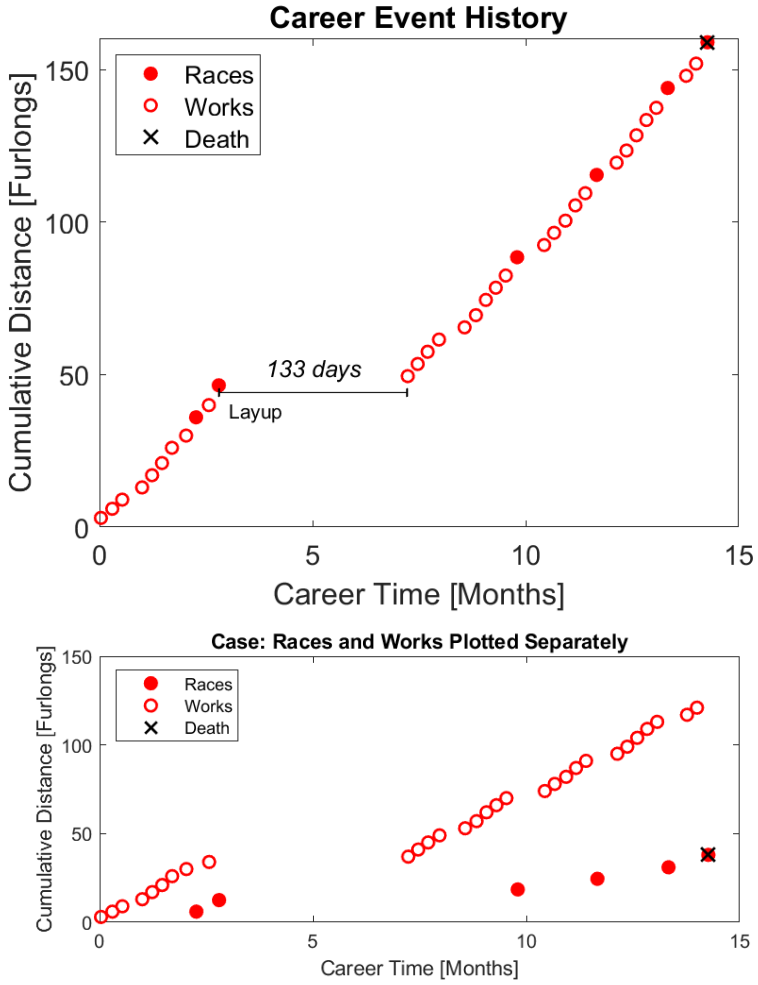
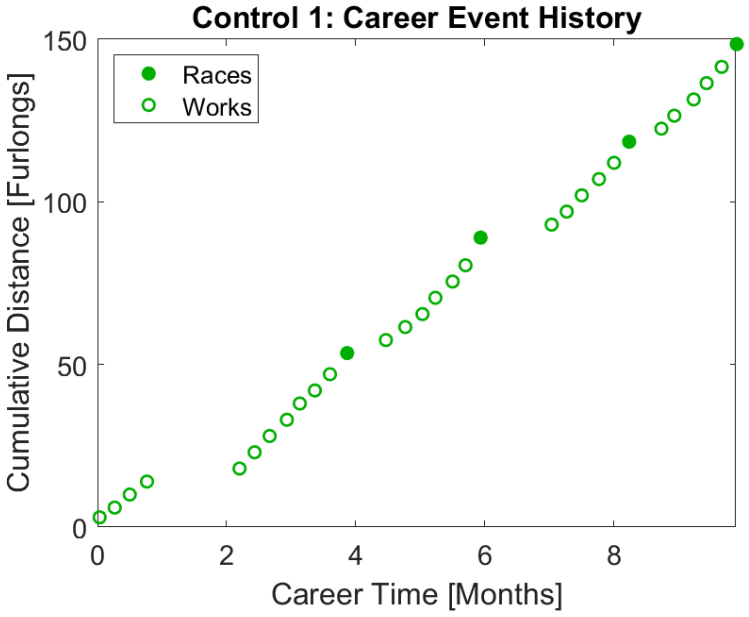
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

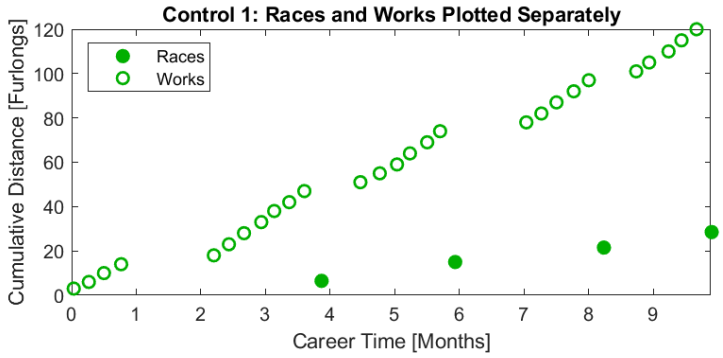
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

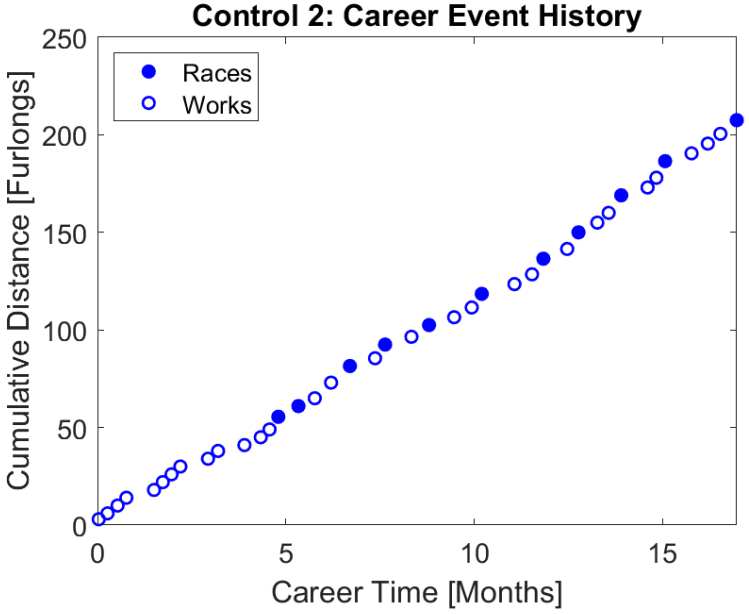


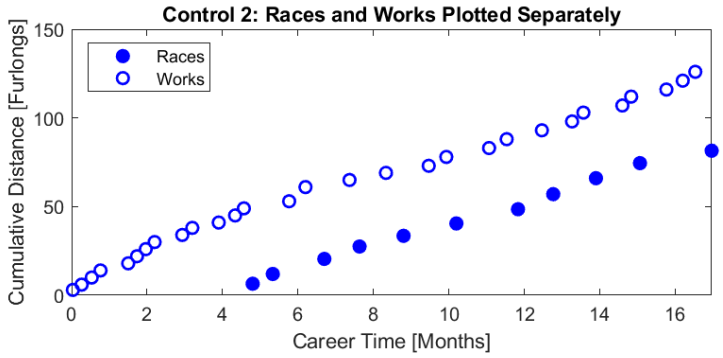
Control 1 High Speed Exercise History



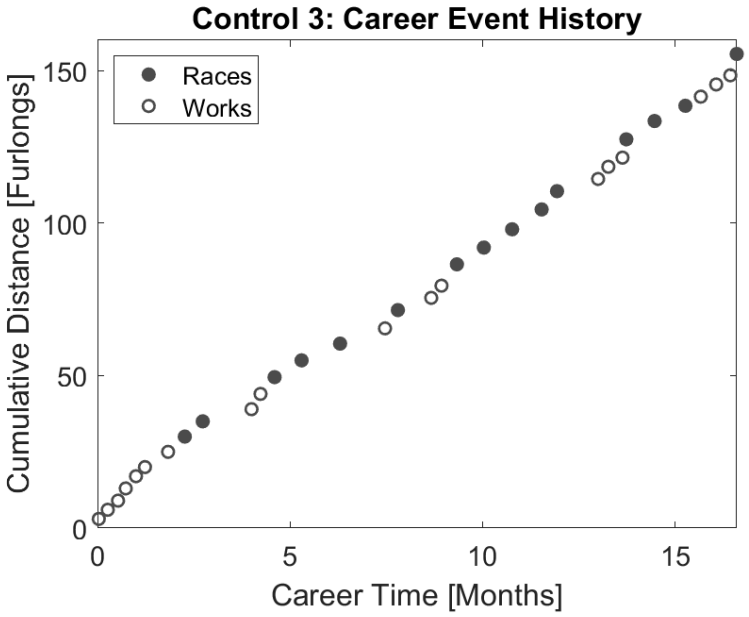


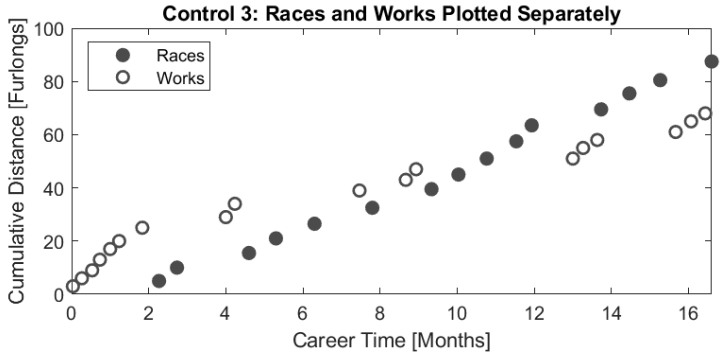
Control 2 High Speed Exercise History



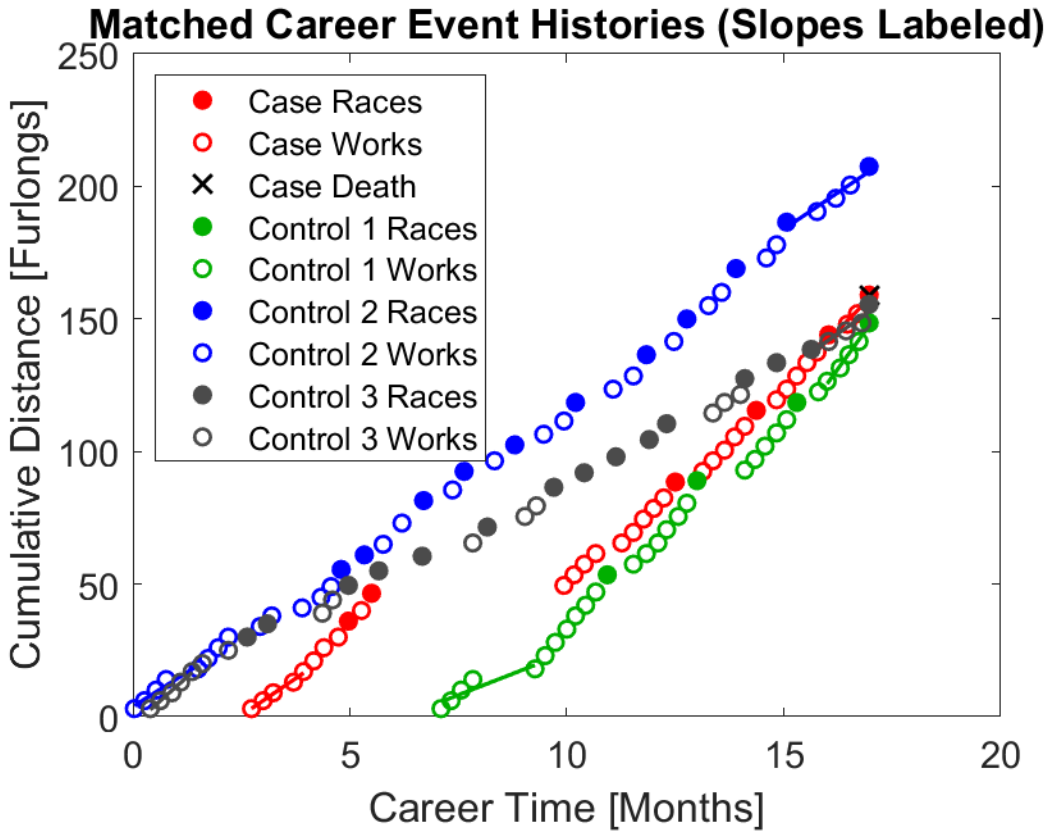


Control 3 High Speed Exercise History

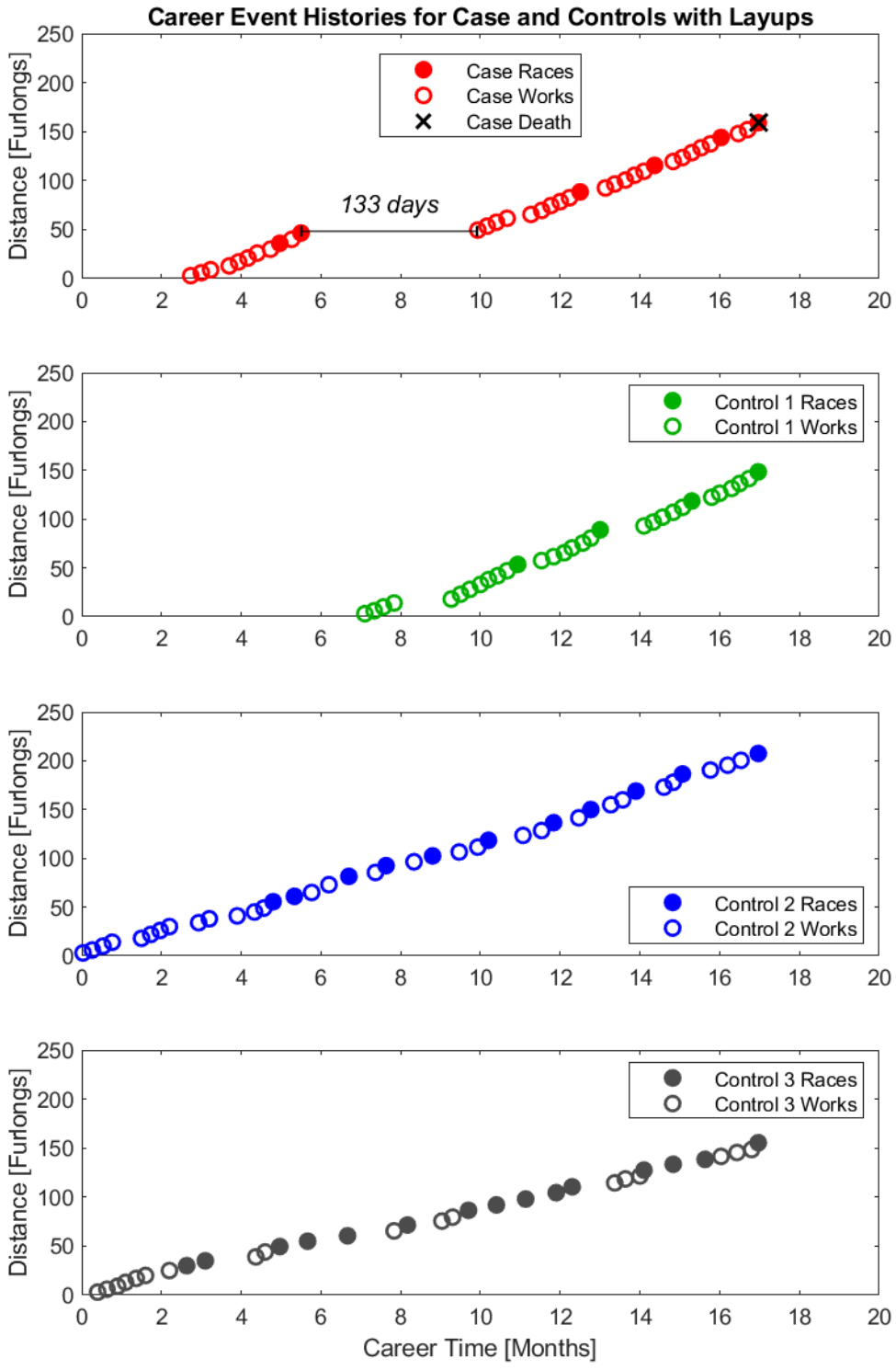


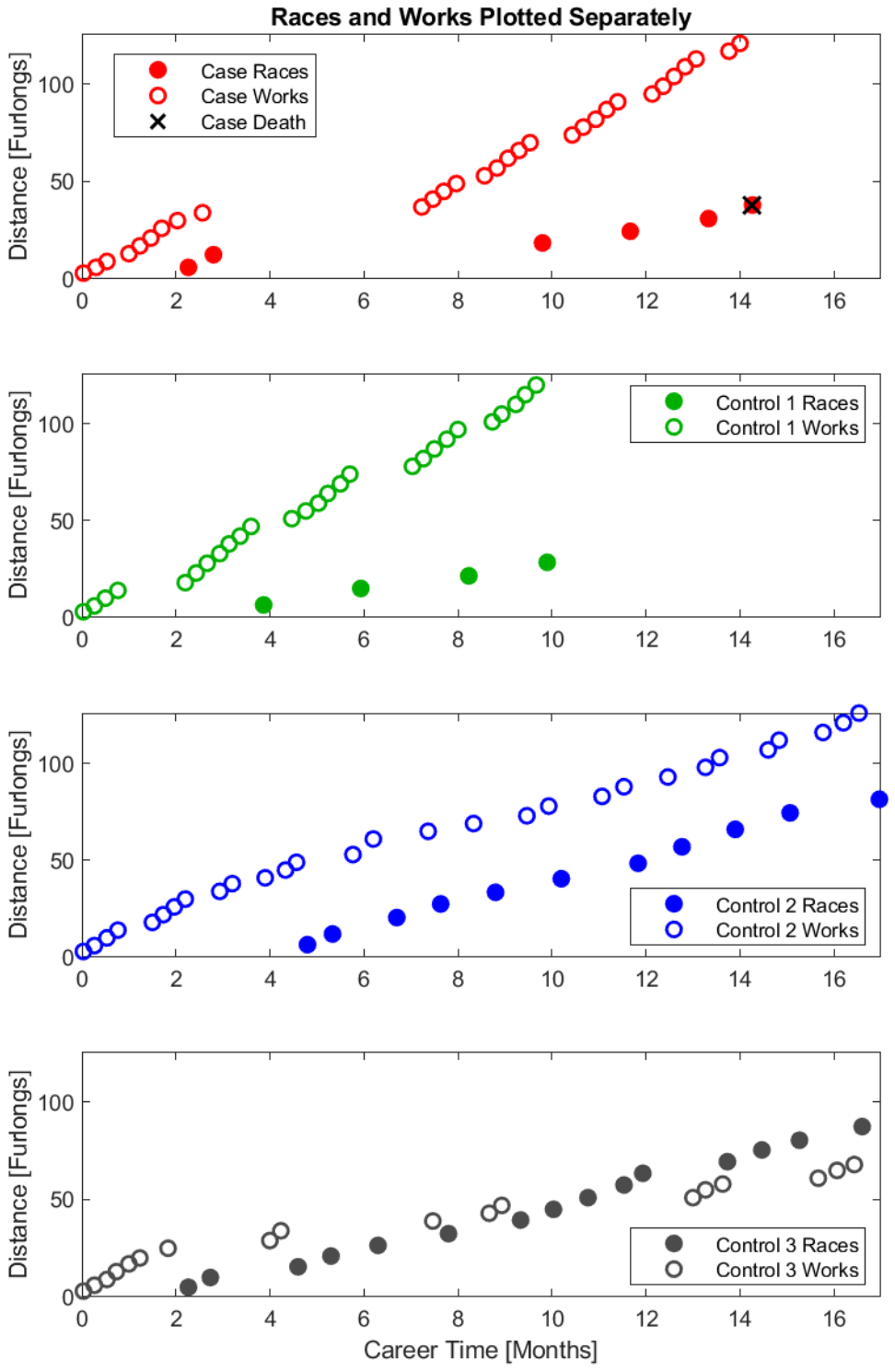


Part 2: Case and Control Horses Plotted Together



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
133 days
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

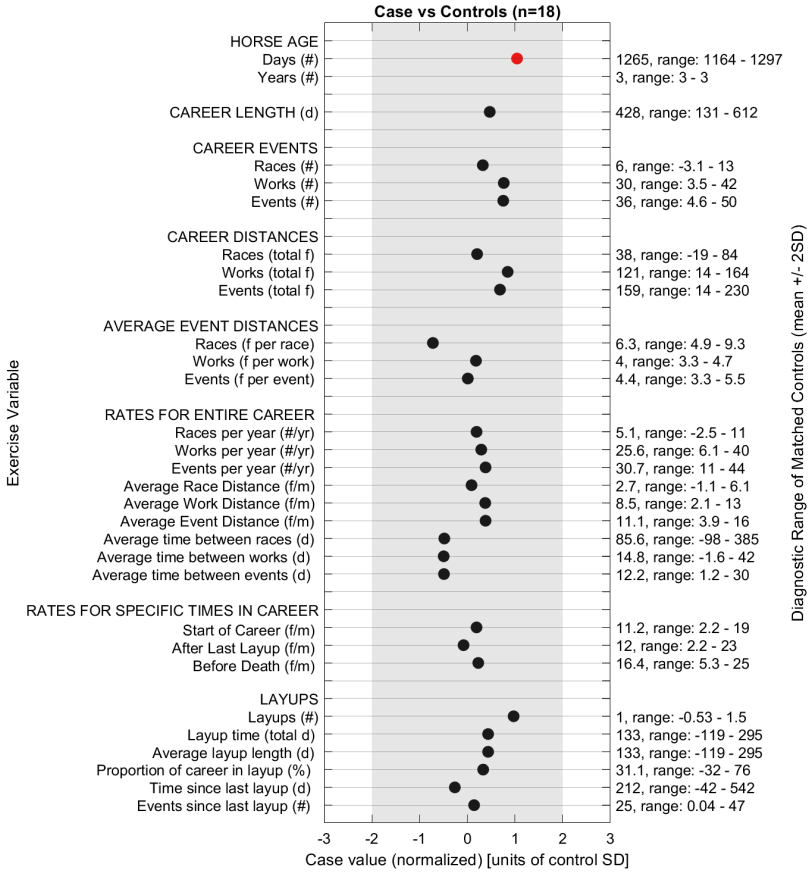

Races and Works Plotted Separately
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Distance [Furlongs]
Career Time [Months]
0
50
100
0
2
4
6
8
10
12
14
16

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/5/2023	R	7.0	SAR	Dirt	Fast		3 /F	TestG1 -500k	0	7
7/28/2023	W	4.0	SAR	Dirt training	Fast	:49.21				
7/21/2023	W	4.0	SAR	Dirt training	Muddy	:49.22				
7/8/2023	R	6.5	BEL	Dirt	Fast		3 /F	VctryRdeG3 -175k	96250	1
6/30/2023	W	4.0	SAR	Dirt training	Fast	:49.40				
6/23/2023	W	5.0	SAR	Dirt training	Fast	01:01.0				
6/16/2023	W	5.0	SAR	Dirt training	Fast	:59.93				
6/9/2023	W	4.0	SAR	Dirt training	Fast	:49.56				
6/2/2023	W	4.0	SAR	Dirt training	Fast	:50.76				
5/19/2023	R	6.0	PIM	Dirt	Fast		3 /F	MsPreknsG3 -150k	90000	1
5/11/2023	W	4.0	PMM	Dirt	Fast	:49.75				
5/4/2023	W	5.0	PMM	Dirt	Fast	:59.35				
4/27/2023	W	4.0	PMM	Dirt	Fast	:46.75				
4/19/2023	W	4.0	PMM	Dirt	Fast	:48.10				
4/12/2023	W	4.0	PMM	Dirt	Wet Fast	:49.10				
3/24/2023	R	6.0	AQU	Dirt	Fast		3 /F	(S) EastViewB -100k	55000	1
3/16/2023	W	4.0	PMM	Dirt	Fast	:51.65				
3/9/2023	W	4.0	PMM	Dirt	Fast	:46.80				
3/2/2023	W	5.0	PMM	Dirt	Fast	01:02.0				
2/23/2023	W	4.0	PMM	Dirt	Fast	:49.40				
2/15/2023	W	4.0	PMM	Dirt	Fast	:48.20				
1/28/2023	W	4.0	PMM	Dirt	Fast	:49.70				
1/20/2023	W	4.0	PMM	Dirt	Fast	:47.55				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
1/13/2023	W	4.0	PMM	Dirt	Fast	:50.45				
1/6/2023	W	3.0	PMM	Dirt	Fast	:37.10				
8/26/2022	R	6.5	SAR	Dirt	Sloppy		2 /F	(S) SeeknAnteB -200k	110000	1
8/19/2022	W	4.0	SAR	Dirt training	Fast	:50.83				
8/10/2022	R	6.0	SAR	Dirt	Fast		2 /F	(S) Msw	48400	1
8/3/2022	W	4.0	SAR	Dirt training	Fast	:48.59				
7/24/2022	W	5.0	SAR	Dirt	Fast	01:01.1				
7/17/2022	W	4.0	SAR	Dirt training	Fast	:47.11				
7/10/2022	W	4.0	SAR	Dirt training	Fast	:49.78				
7/3/2022	W	4.0	SAR	Dirt training	Fast	:49.51				
6/19/2022	W	3.0	SAR	Dirt training	Fast	:37.99				
6/12/2022	W	3.0	SAR	Dirt training	Fast	:36.45				
6/4/2022	W	3.0	SAR	Dirt training	Fast	:39.94				

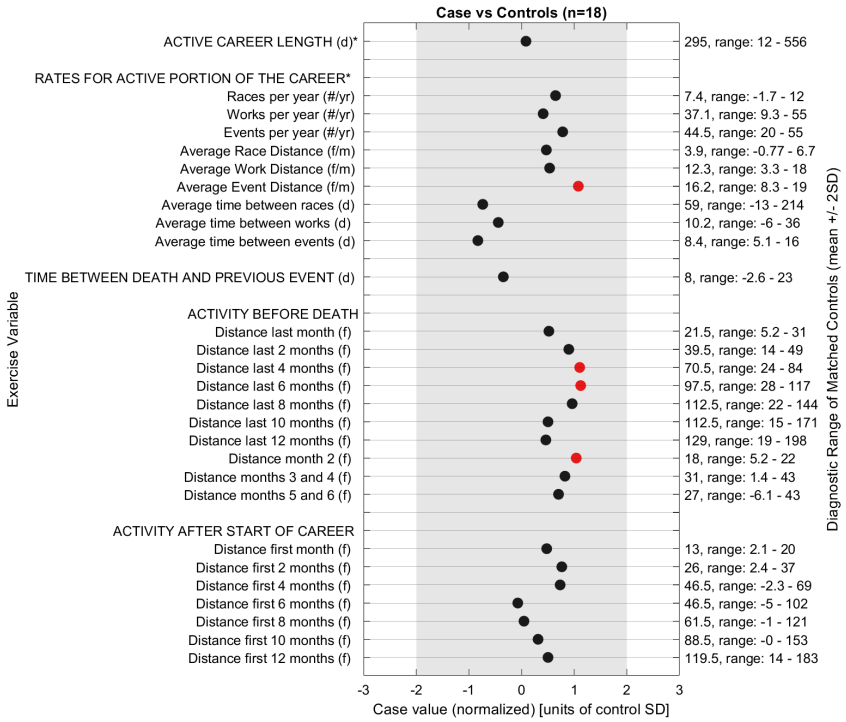
Part 4: Comparison of Exercise Variables between Case Horse and 18 Control Horses (3 year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, female, Thoroughbreds (n=18) (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 3 year old, female, Thoroughbreds (n=18) (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.

Exercise History Report (Full)
New York Thunder

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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).

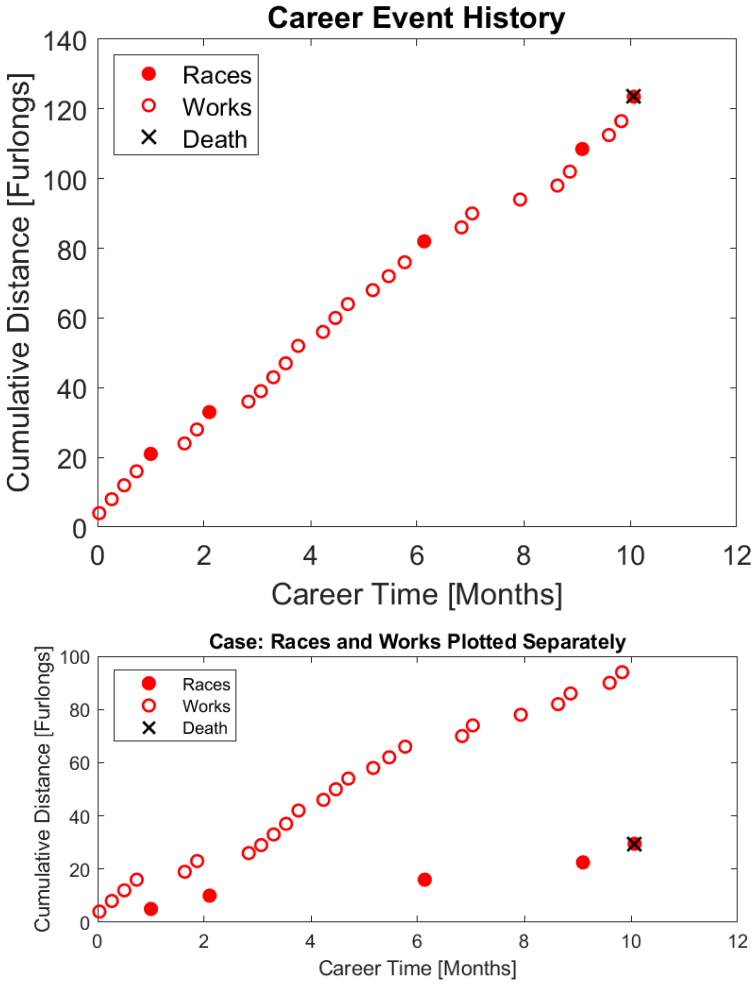
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

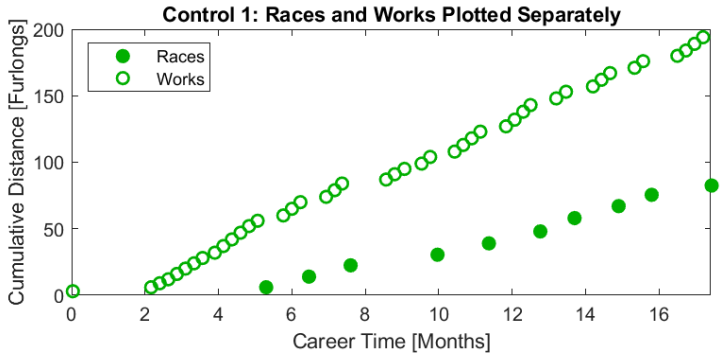
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

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.

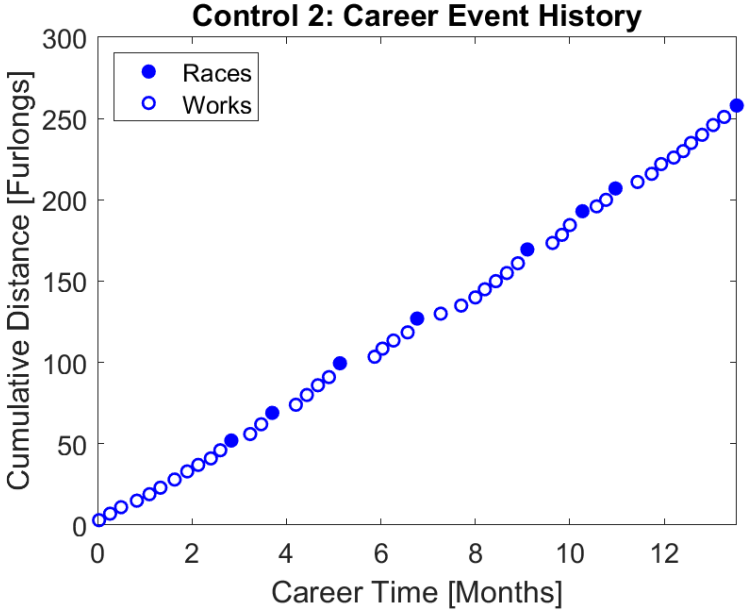
Case Horse High Speed Exercise History

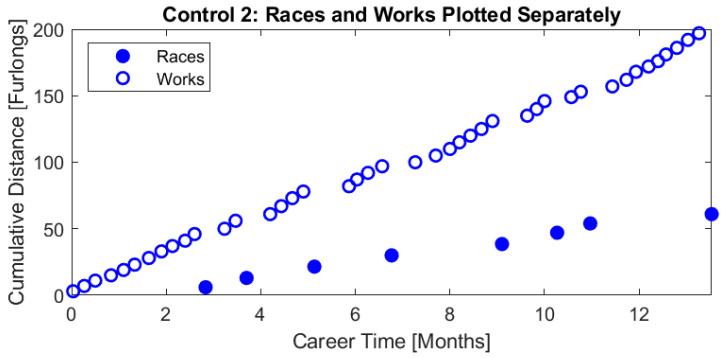


Control 1 High Speed Exercise History

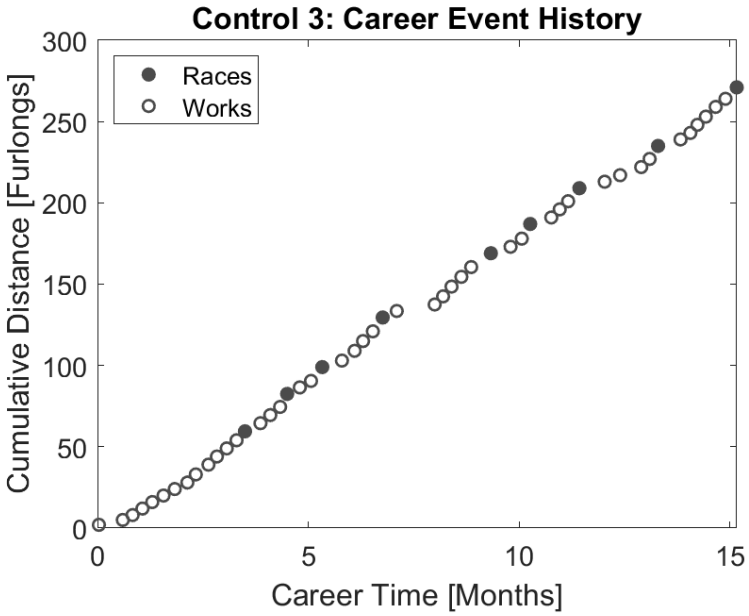


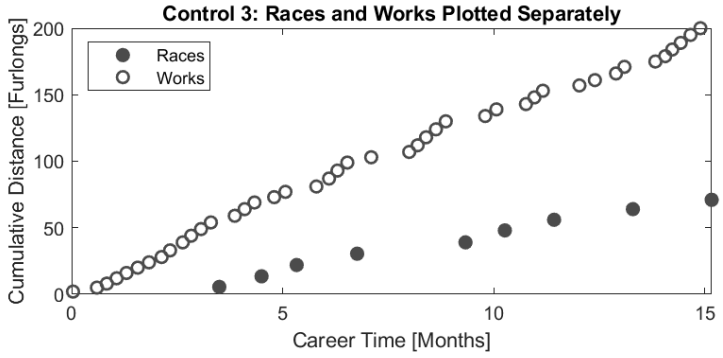
Control 2 High Speed Exercise History



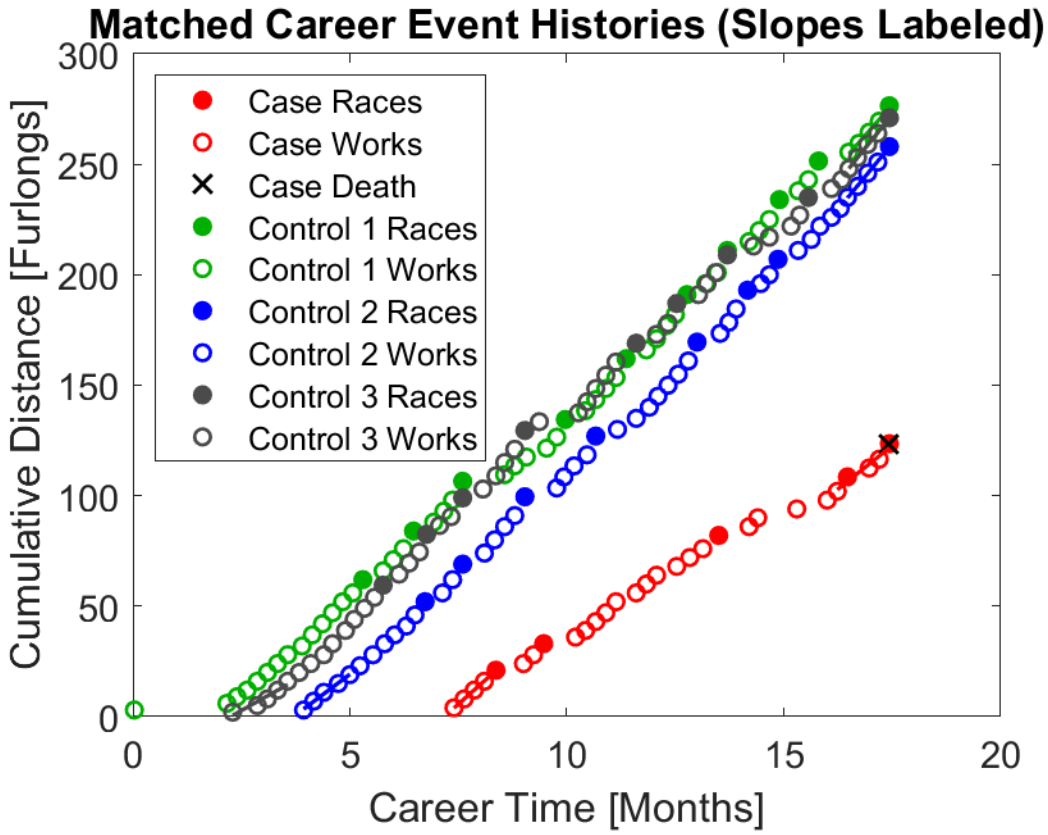


Control 3 High Speed Exercise History

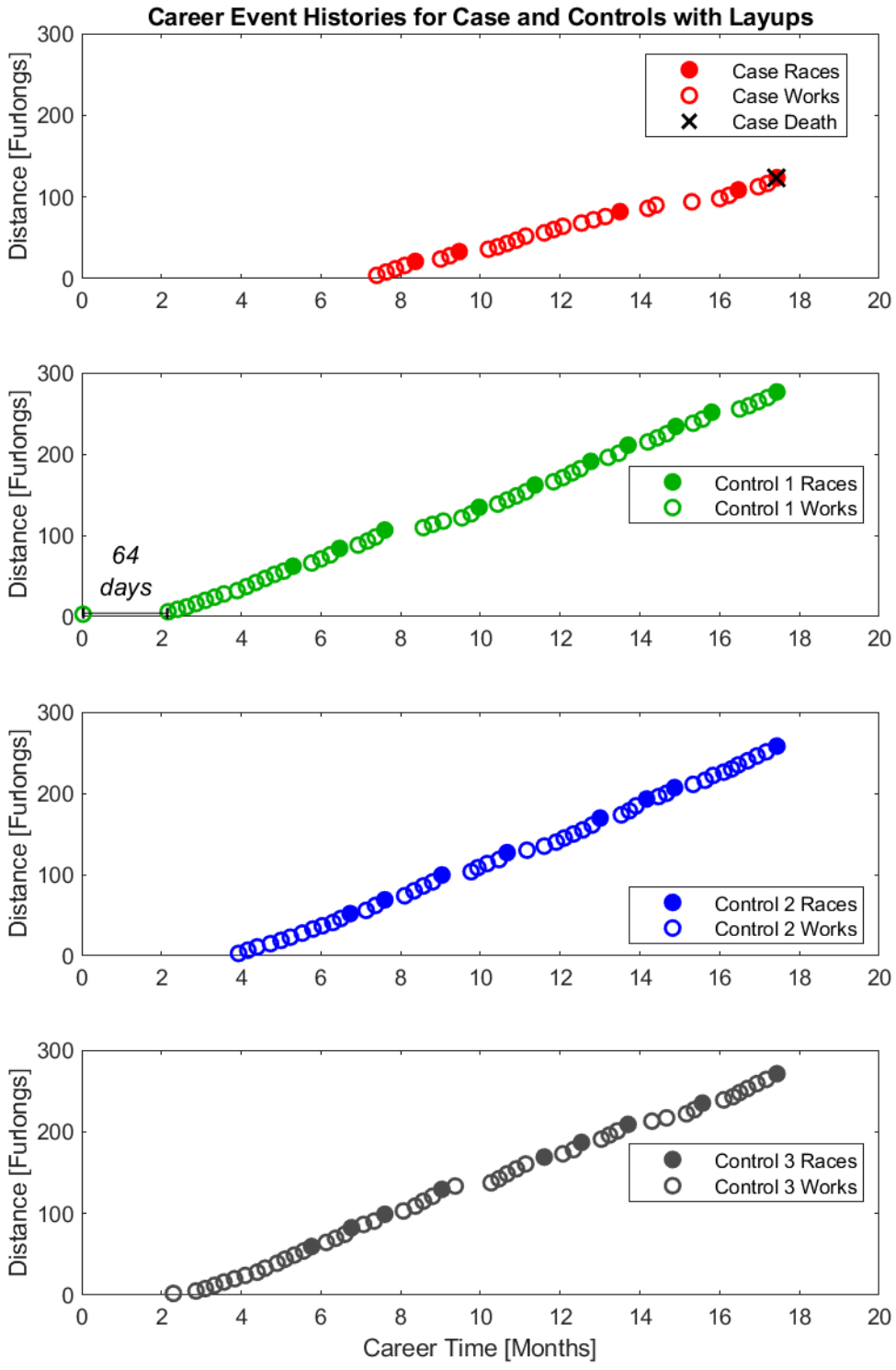


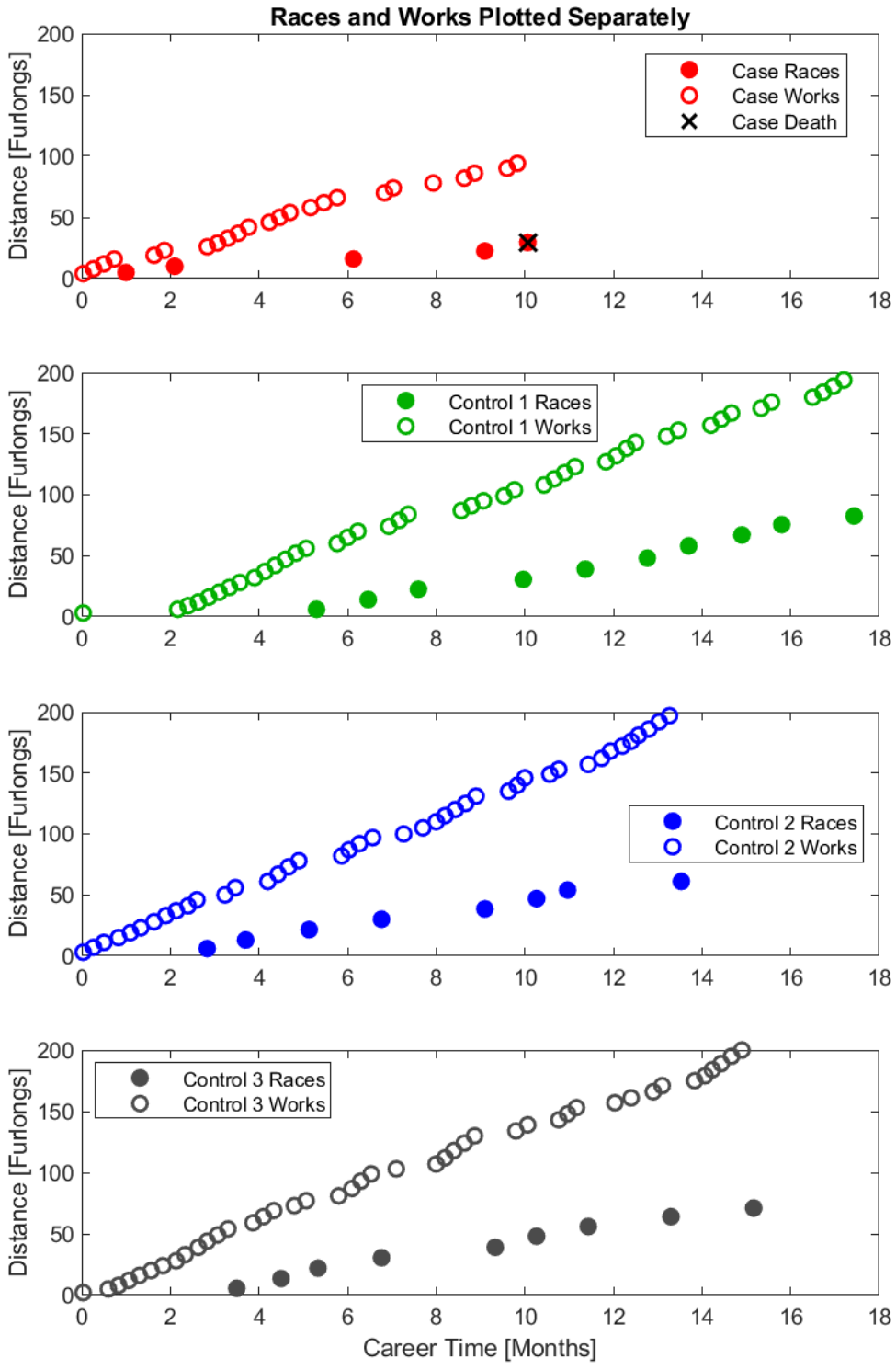


Part 2: Case and Control Horses Plotted Together



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
Control 1 Races
Control 1 Works
64
days
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

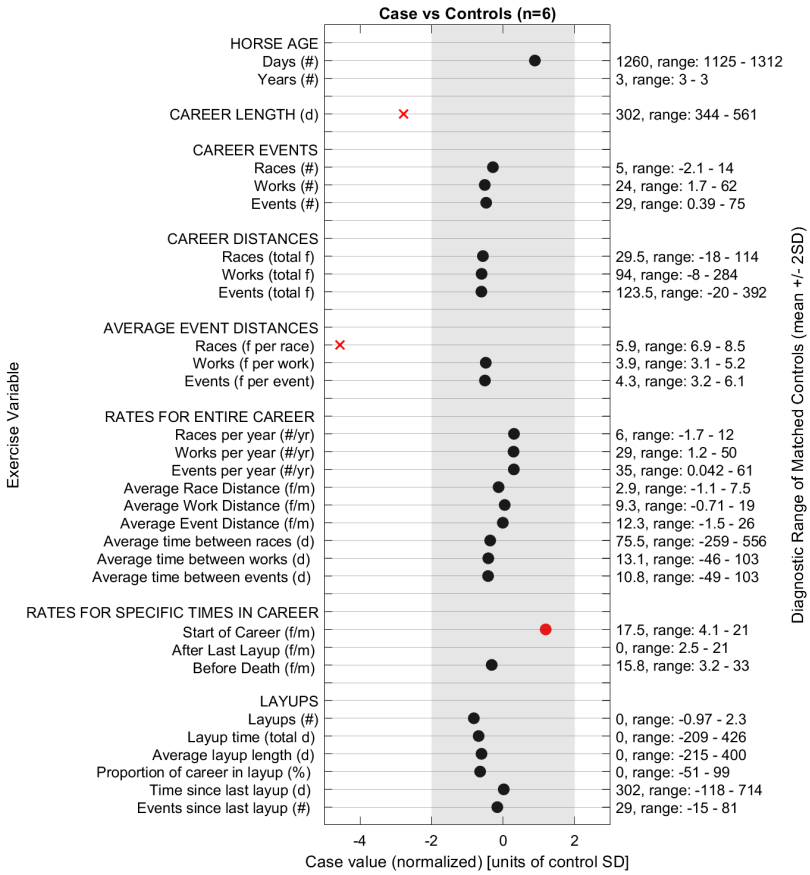

Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/26/2023	R	7.0	SAR	Dirt	Muddy		3	HAJrknsMG1 -500k	0	6
8/19/2023	W	4.0	MTH	Dirt	Fast	:52.00				
8/12/2023	W	4.0	MTH	Dirt	Fast	:52.00				
7/28/2023	R	6.5	SAR	Dirt	Fast		3	AmstrdamG2 -200k	110000	1
7/21/2023	W	4.0	MTH	Dirt	Fast	:47.00				
7/14/2023	W	4.0	MTH	Dirt	Fast	:52.60				
6/23/2023	W	4.0	MTH	Dirt	Fast	:48.00				
5/27/2023	W	4.0	MTH	Dirt	Fast	:46.40				
5/21/2023	W	4.0	MTH	Dirt	Muddy	:49.60				
4/30/2023	R	6.0	WO	AllWthr	Fast		3	WoodstockL -125k	55123	1
4/19/2023	W	4.0	KEE	Dirt	Fast	:49.20				
4/10/2023	W	4.0	KEE	Dirt	Fast	:48.20				
4/1/2023	W	4.0	KEE	Dirt	Good	:46.80				
3/18/2023	W	4.0	TP	AllWthr	Fast	:50.80				
3/11/2023	W	4.0	TP	AllWthr	Fast	:50.20				
3/4/2023	W	4.0	GP	Dirt	Fast	:48.03				
2/18/2023	W	5.0	GP	Dirt	Fast	:58.61				
2/11/2023	W	4.0	GP	Dirt	Fast	:48.18				
2/4/2023	W	4.0	GP	Dirt	Fast	:49.70				
1/28/2023	W	3.0	GP	Dirt	Fast	:37.52				
1/21/2023	W	3.0	GP	Dirt	Fast	:36.31				
12/30/2022	R	5.0	GP	Turf	Firm		2	Aoc75000nw1/ x-N	43200	1
12/23/2022	W	4.0	GP	Dirt	Fast	:47.42				
12/16/2022	W	3.0	GP	Dirt	Fast	:37.50				
11/27/2022	R	5.0	GP	AllWthr	Fast		2	Msw	24000	1
11/19/2022	W	4.0	GP	Dirt	Fast	:47.47				
11/12/2022	W	4.0	GP	Dirt	Fast	:48.42				
11/5/2022	W	4.0	GP	Dirt	Fast	:51.69				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
10/29/2022	W	4.0	GP	Dirt	Fast	:48.47				

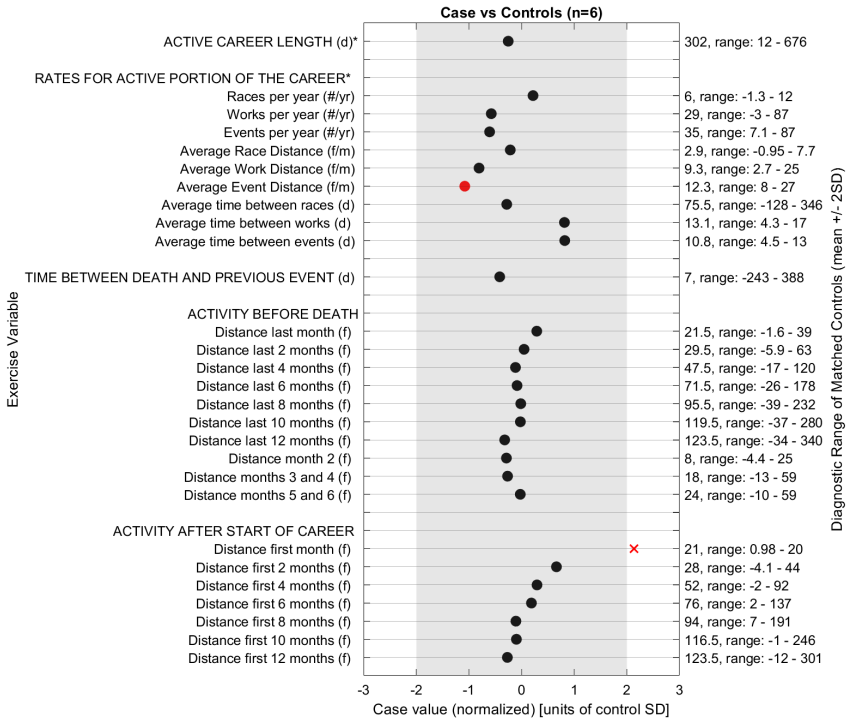
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (3 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, male, Thoroughbreds (n=6) (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 3 year old, male, Thoroughbreds (n=6) (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.

Exercise History Report (Full)
Nobel (IRE)

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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).

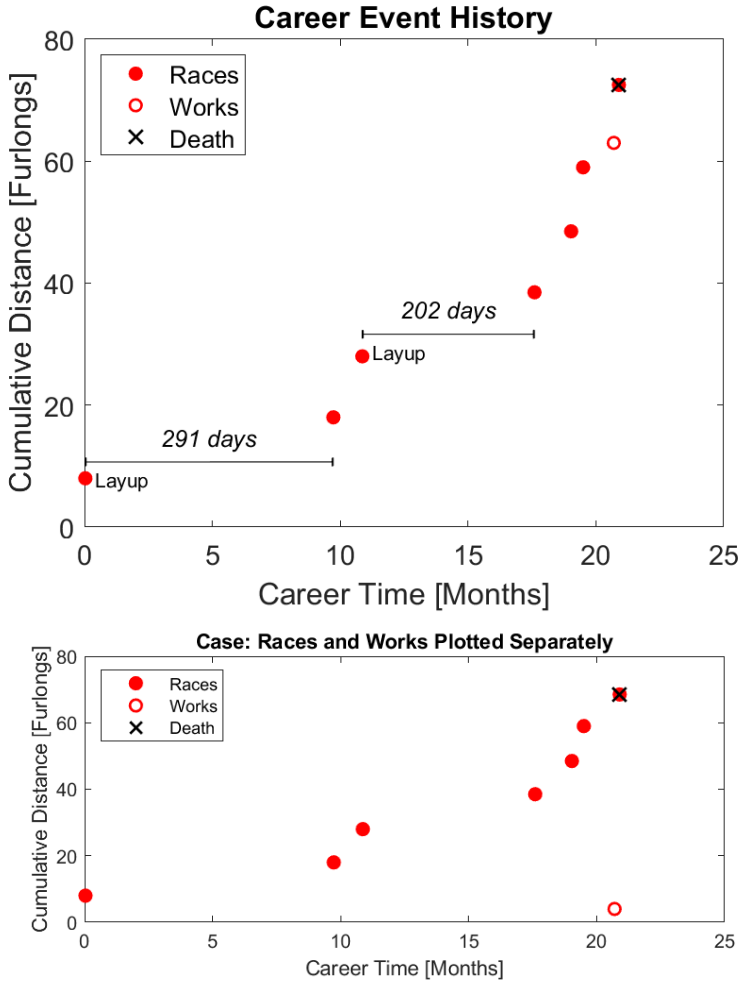
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

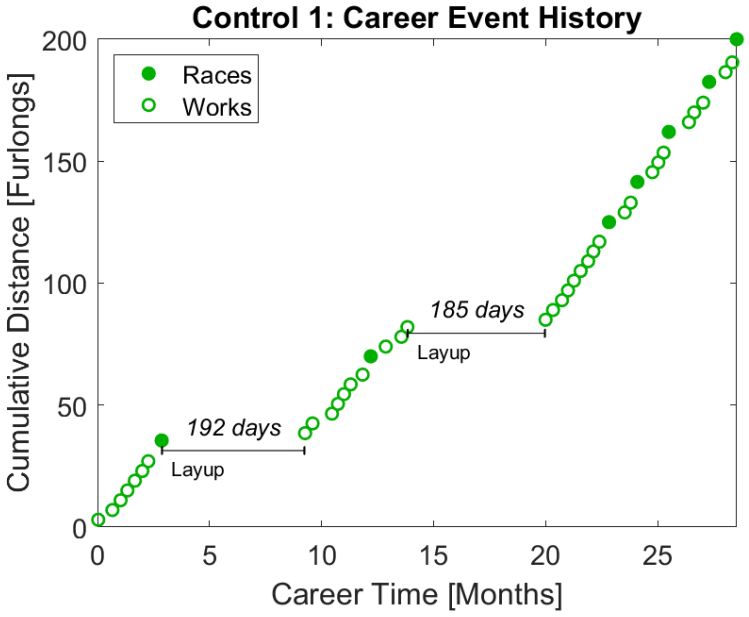
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

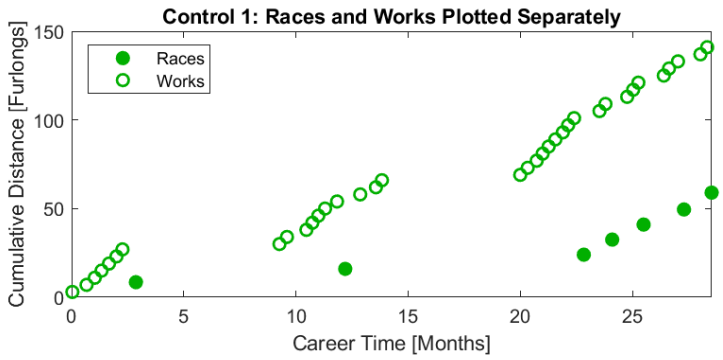
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

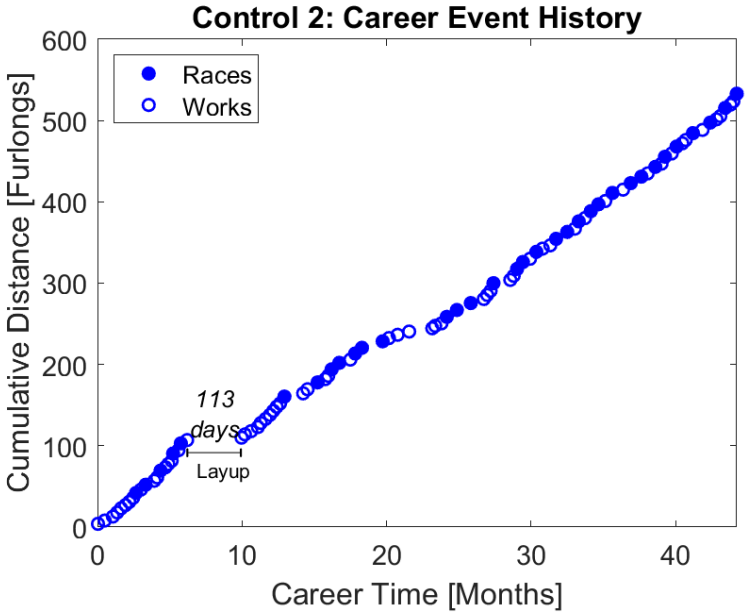


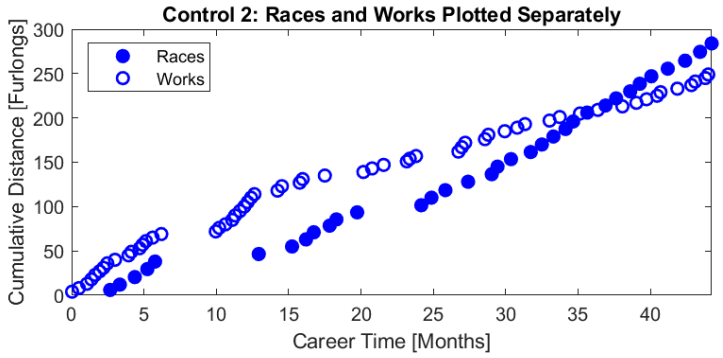
Control 1 High Speed Exercise History



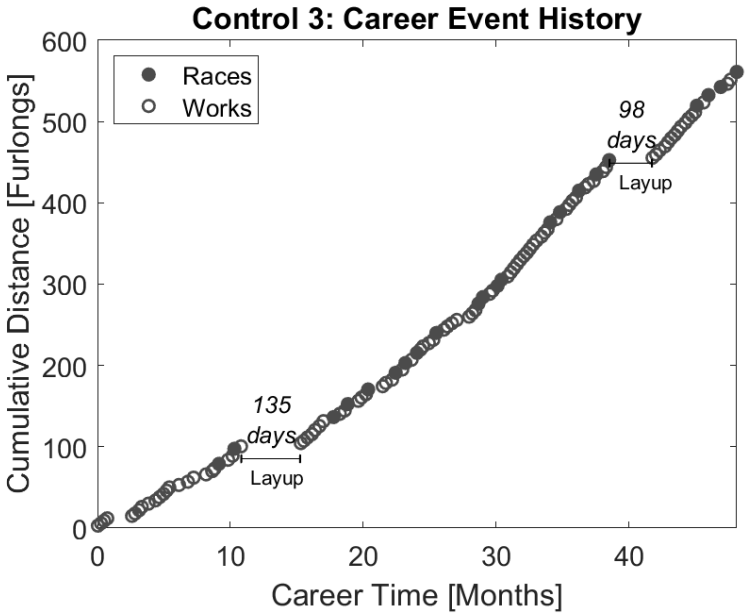


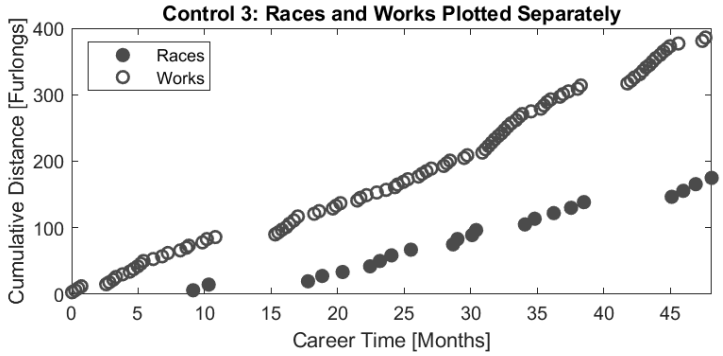
Control 2 High Speed Exercise History



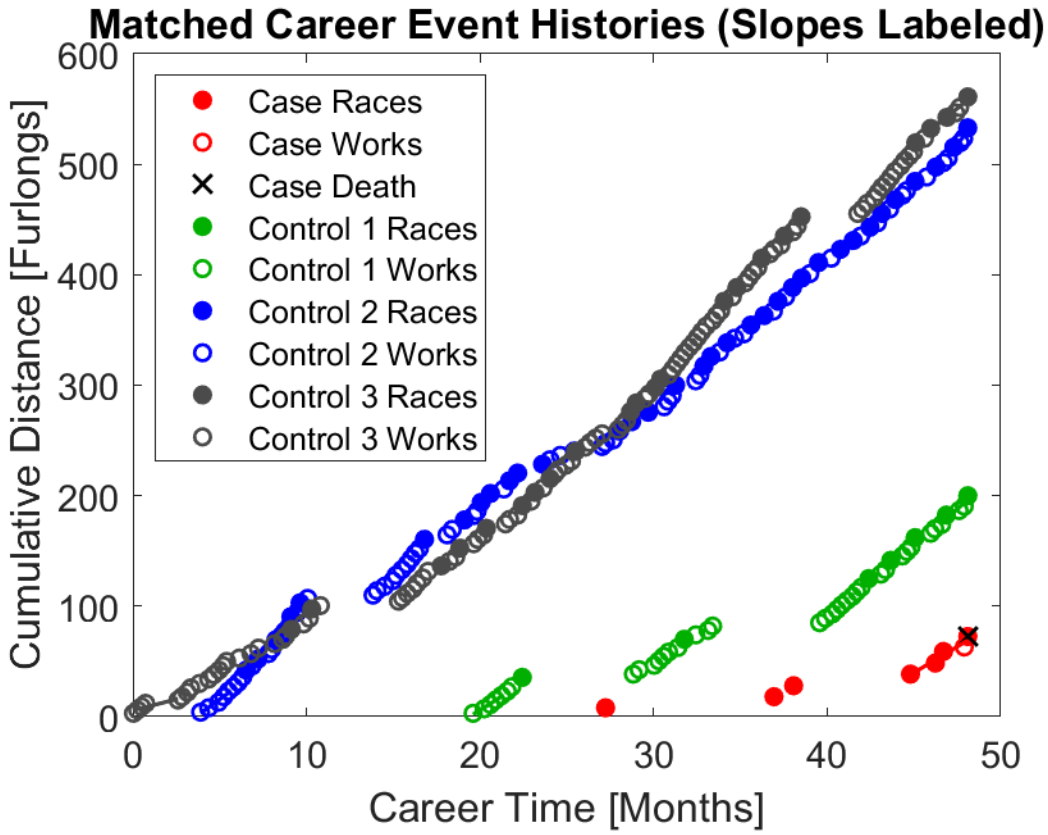


Control 3 High Speed Exercise History

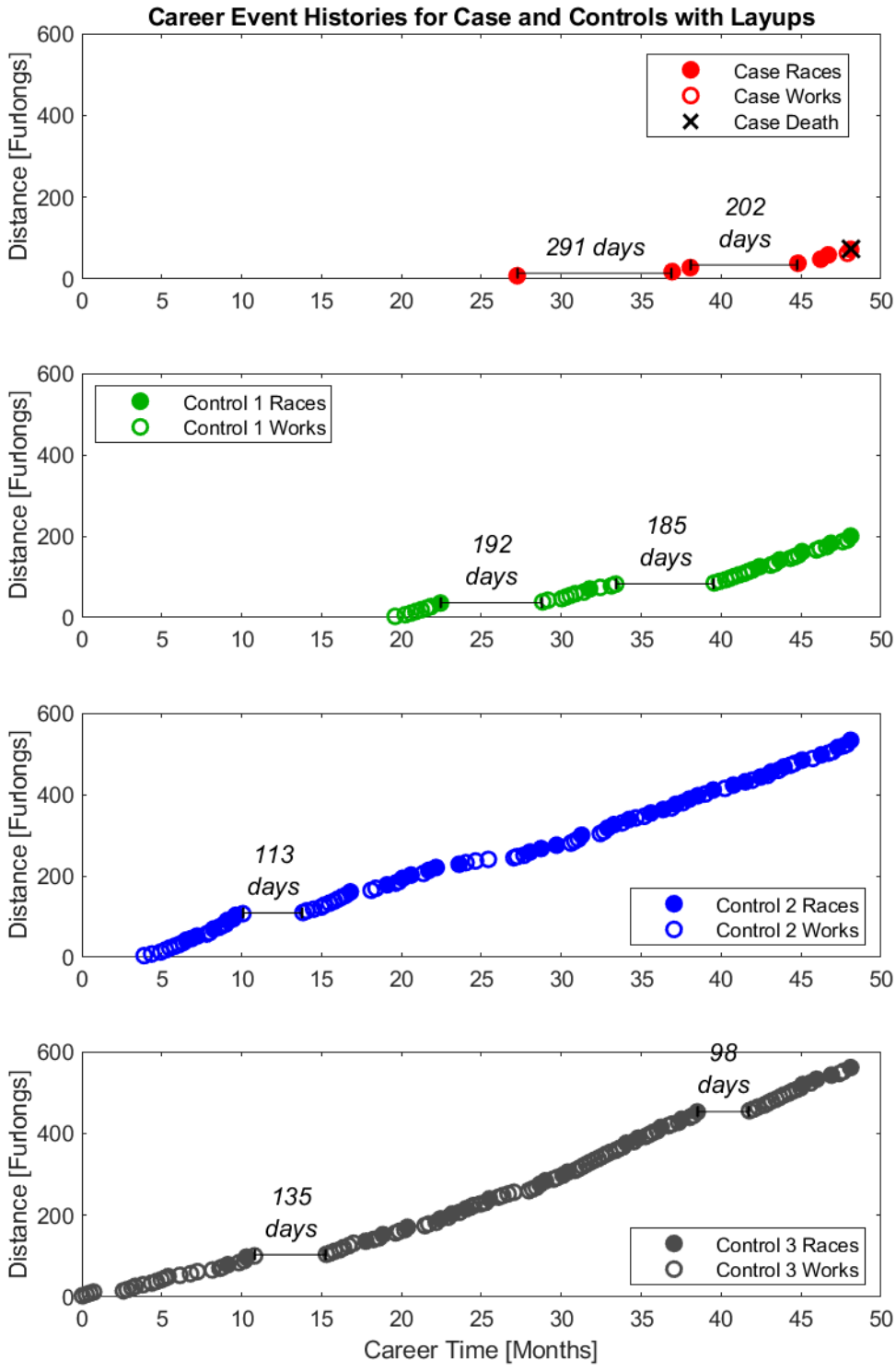


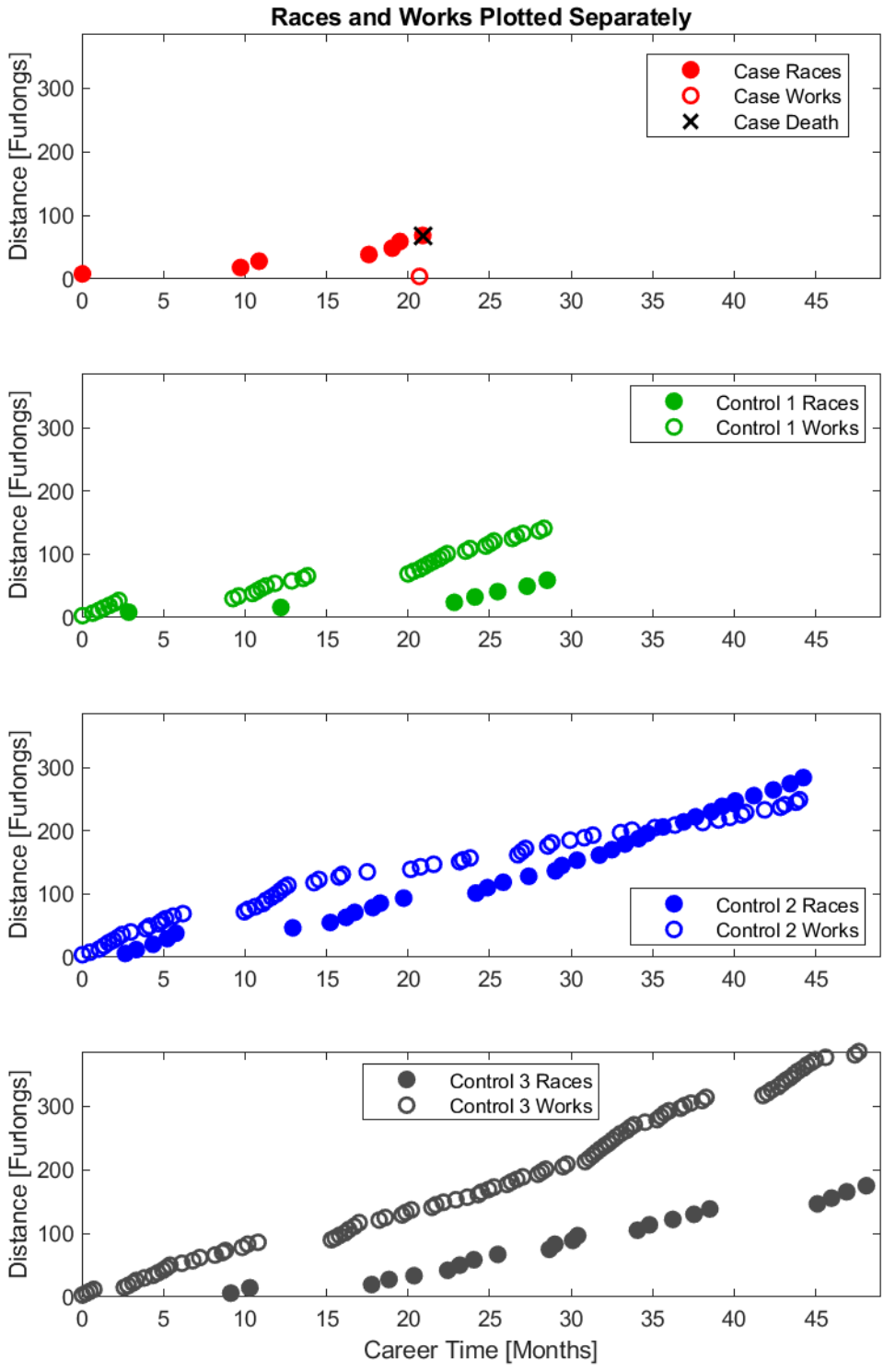


Part 2: Case and Control Horses Plotted Together



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.

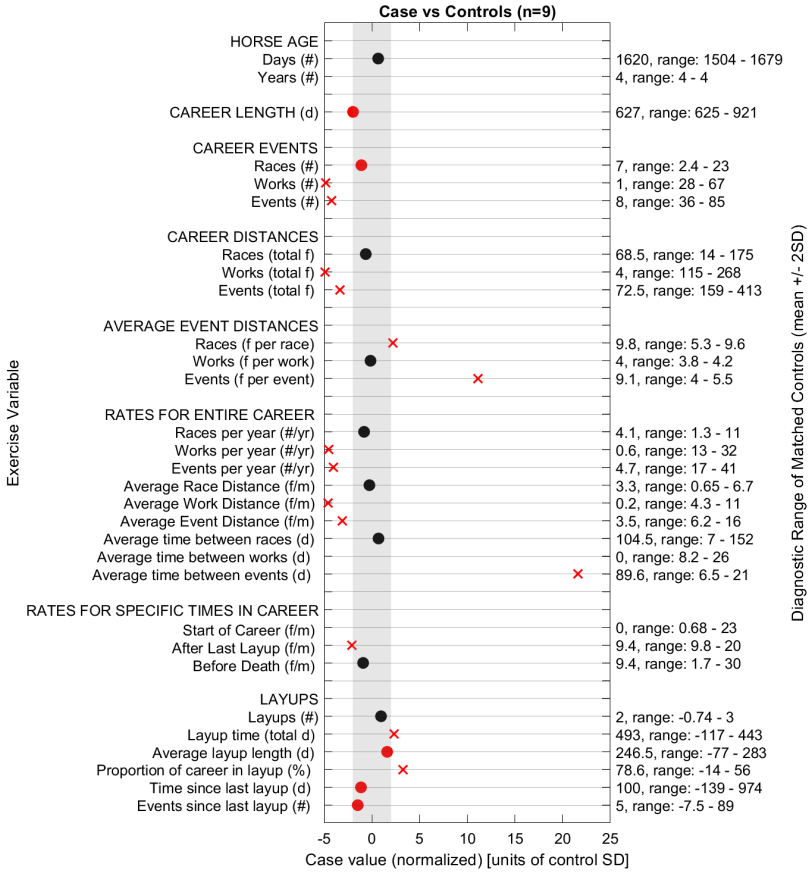

Career Event Histories for Case and Controls with Layups
Distance [Furlongs]
Case Races
Case Works
Case Death
291 days
202 days
Control 1 Races
Control 1 Works
192 days
185 days
Control 2 Races
Control 2 Works
113 days
Control 3 Races
Control 3 Works
135 days
98 days
Career Time [Months]


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
8/26/2023	R	9.5	SAR	Turf	Good		3U	Aoc62500nw2$/4800 x-N		5
8/20/2023	W	4.0	SAR	Turf	Good	:48.20				
7/15/2023	R	10.5	YOR	Turf	Good to Soft		3U	H261864	15817	4
7/1/2023	R	10.0	NC	AllWthr	Slow		4U	H19300	10422	1
5/19/2023	R	10.5	YOR	Turf	Good to Firm		4U	H43431	0	10
10/29/2022	R	10.0	NEW	Turf	Soft		3U	Stk - 60k	0	8
9/25/2022	R	10.0	EPS	Turf	Good		3U	Wn10851	5859	1
12/8/2021	R	8.0	KEM	AllWthr	Slow		2	Wn8608	4648	1

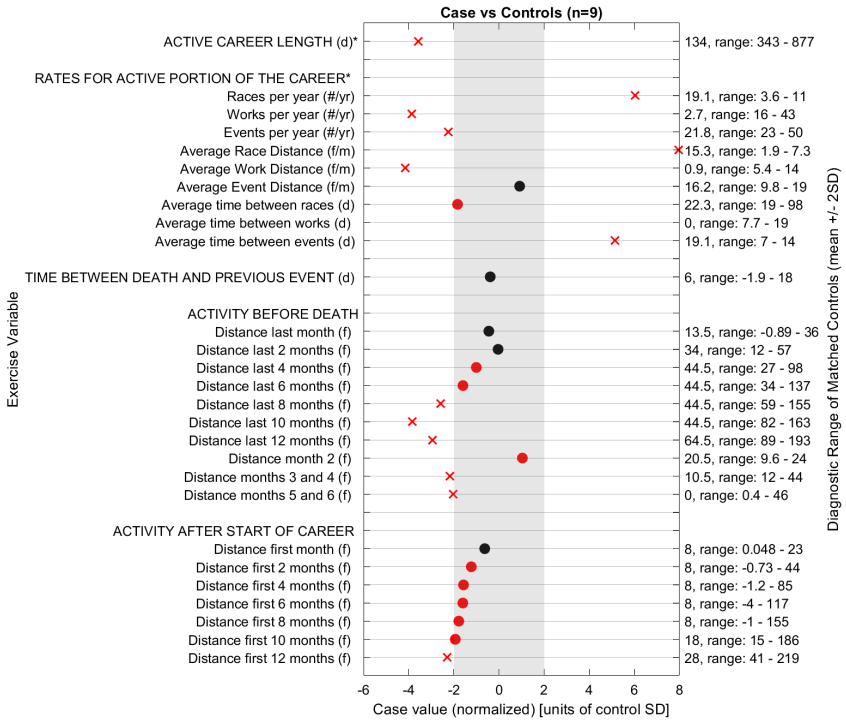
Part 4: Comparison of Exercise Variables between Case Horse and 9 Control Horses (4 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, male, Thoroughbreds (n=9) (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=9) (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.

Exercise History Report (Full)
Sopran Basilea (IRE)

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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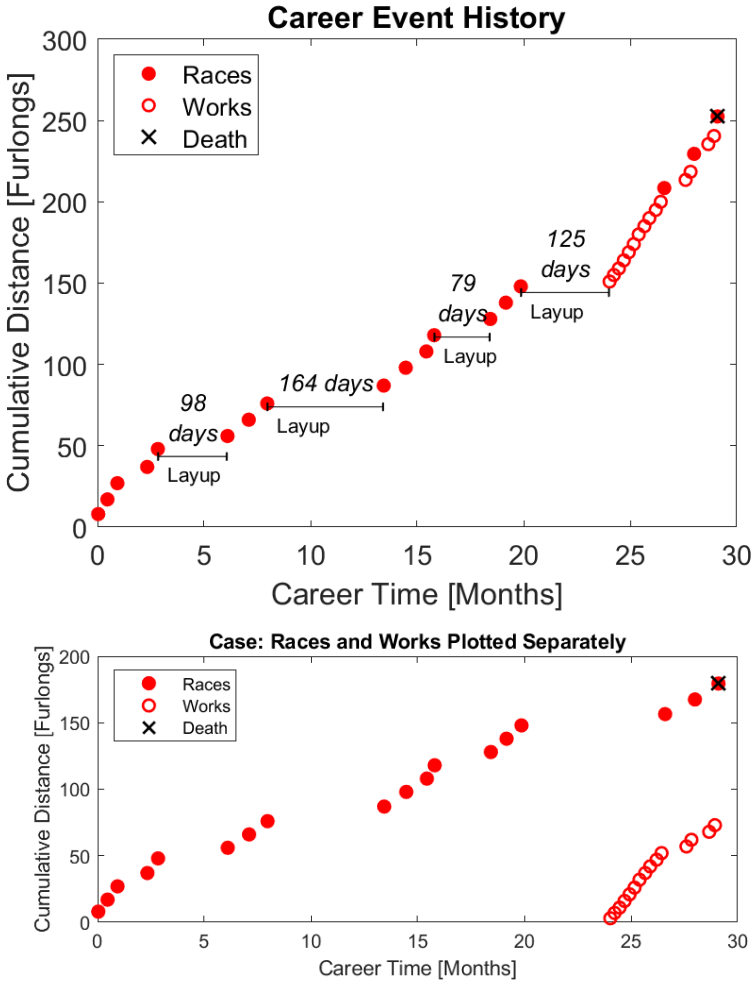
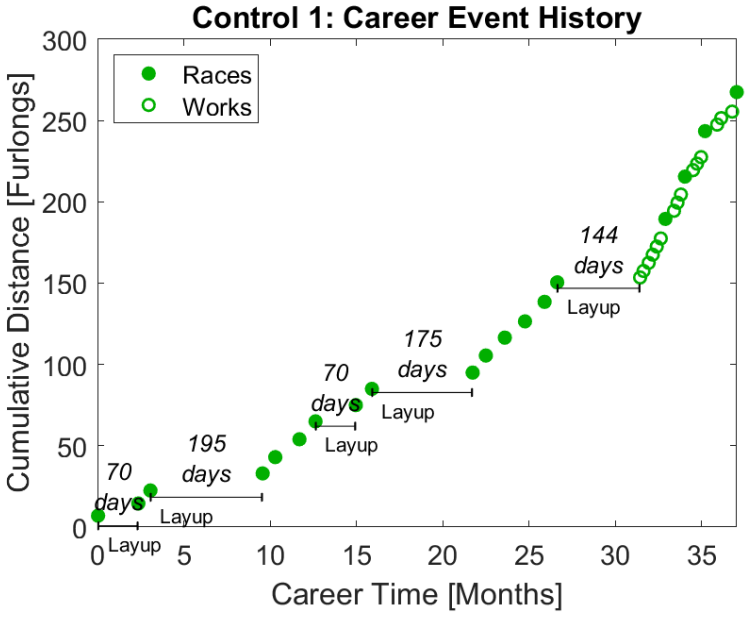
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

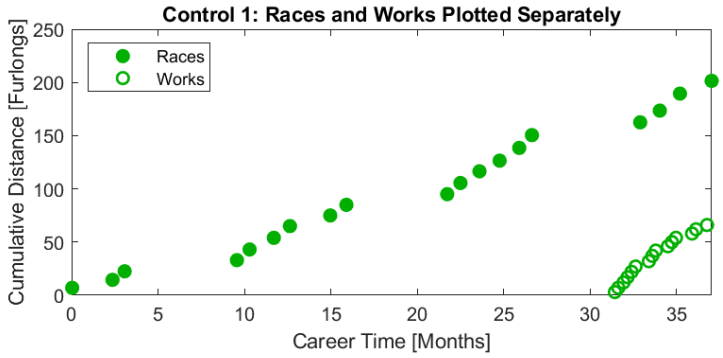
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

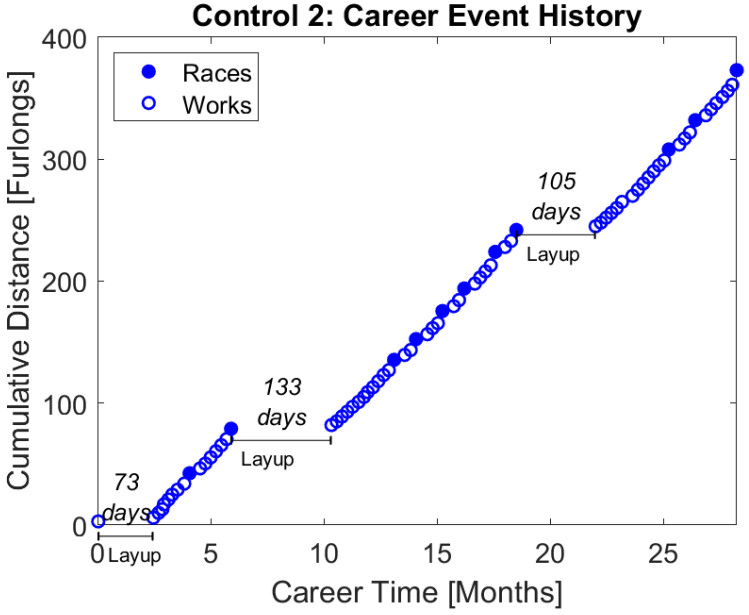


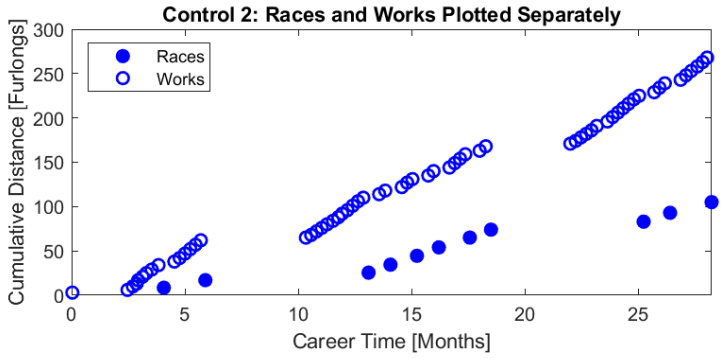
Control 1 High Speed Exercise History



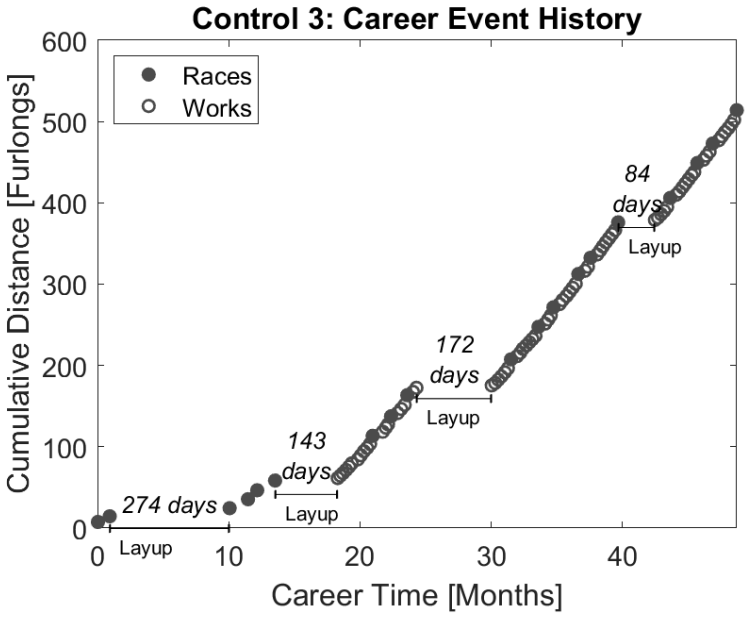


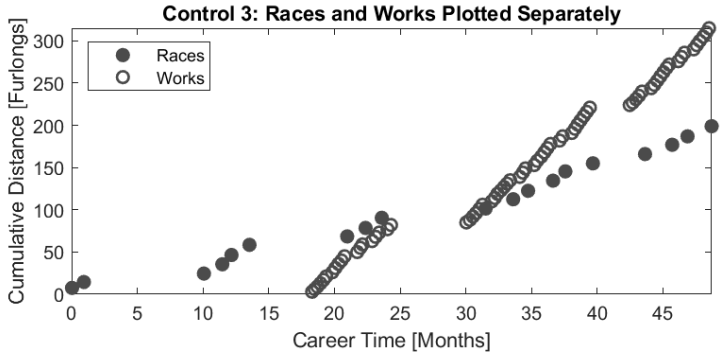
Control 2 High Speed Exercise History



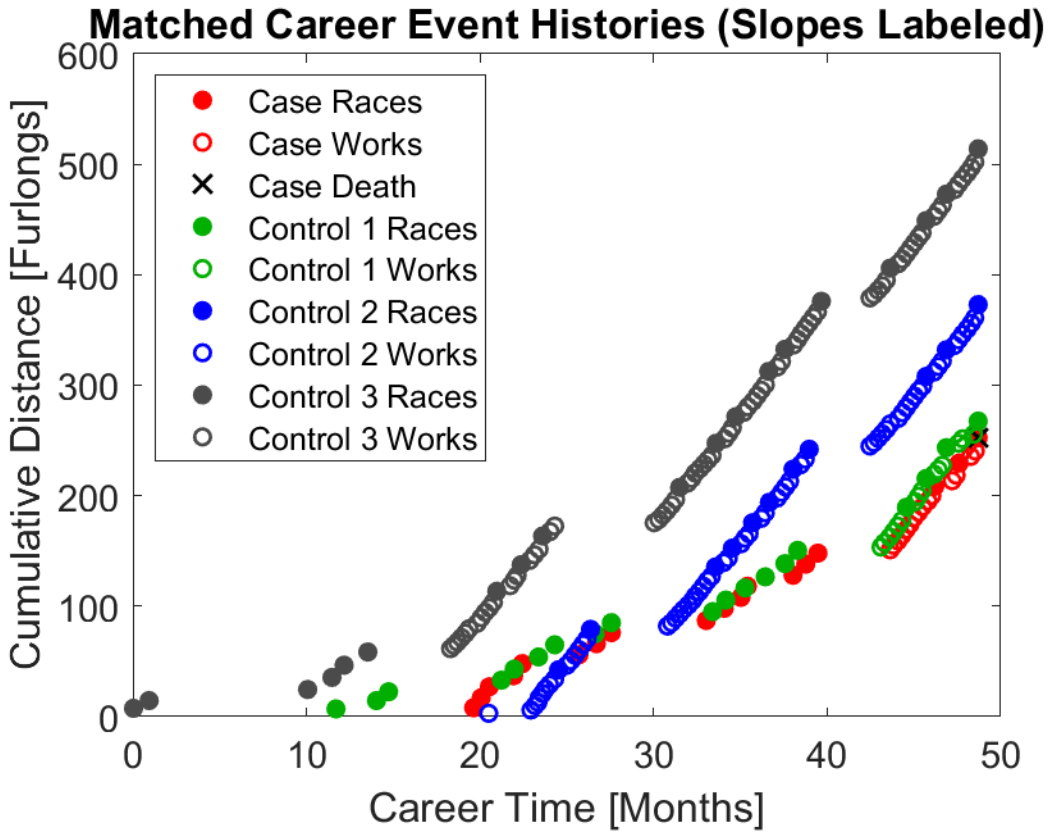


Control 3 High Speed Exercise History

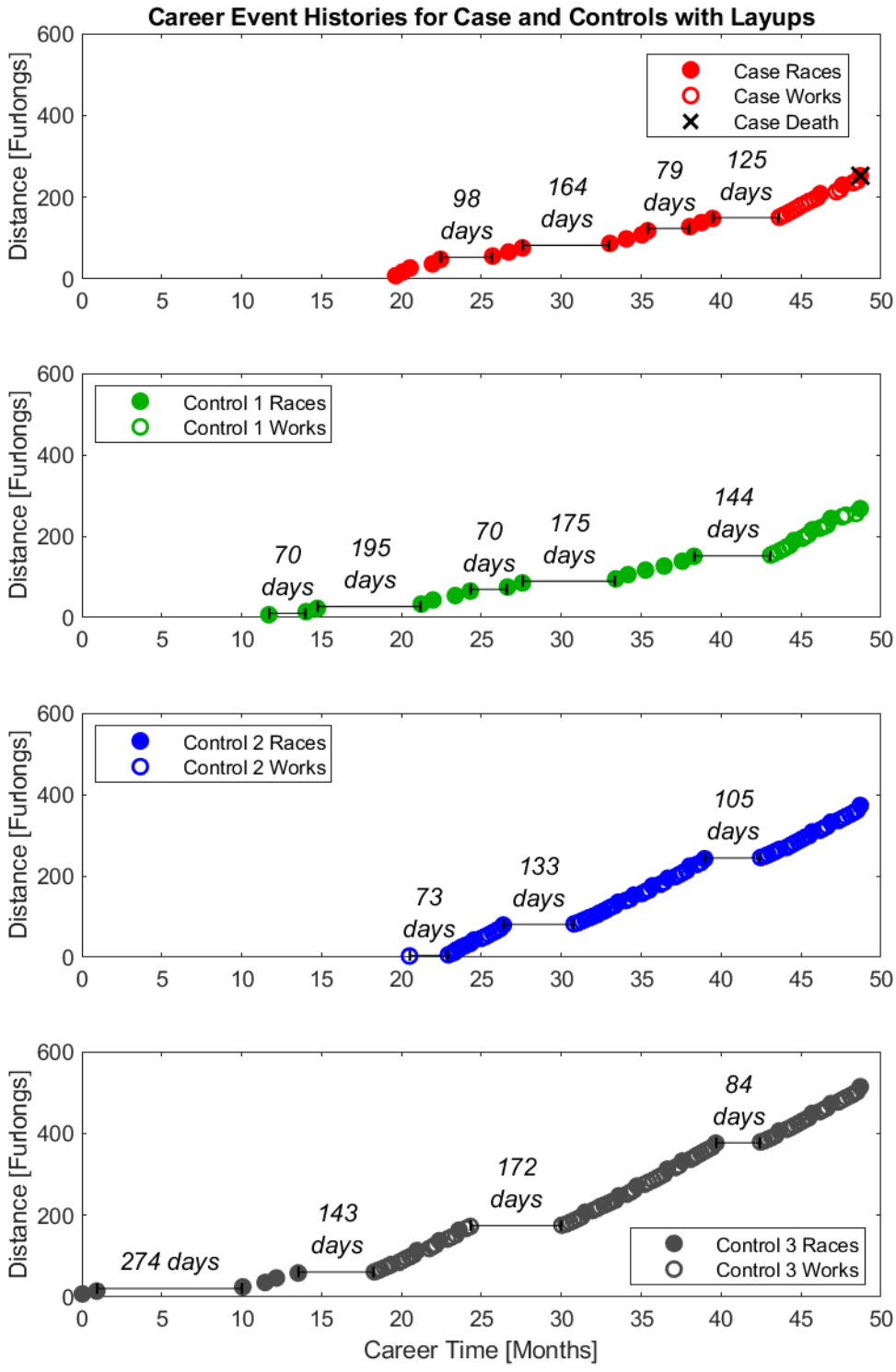


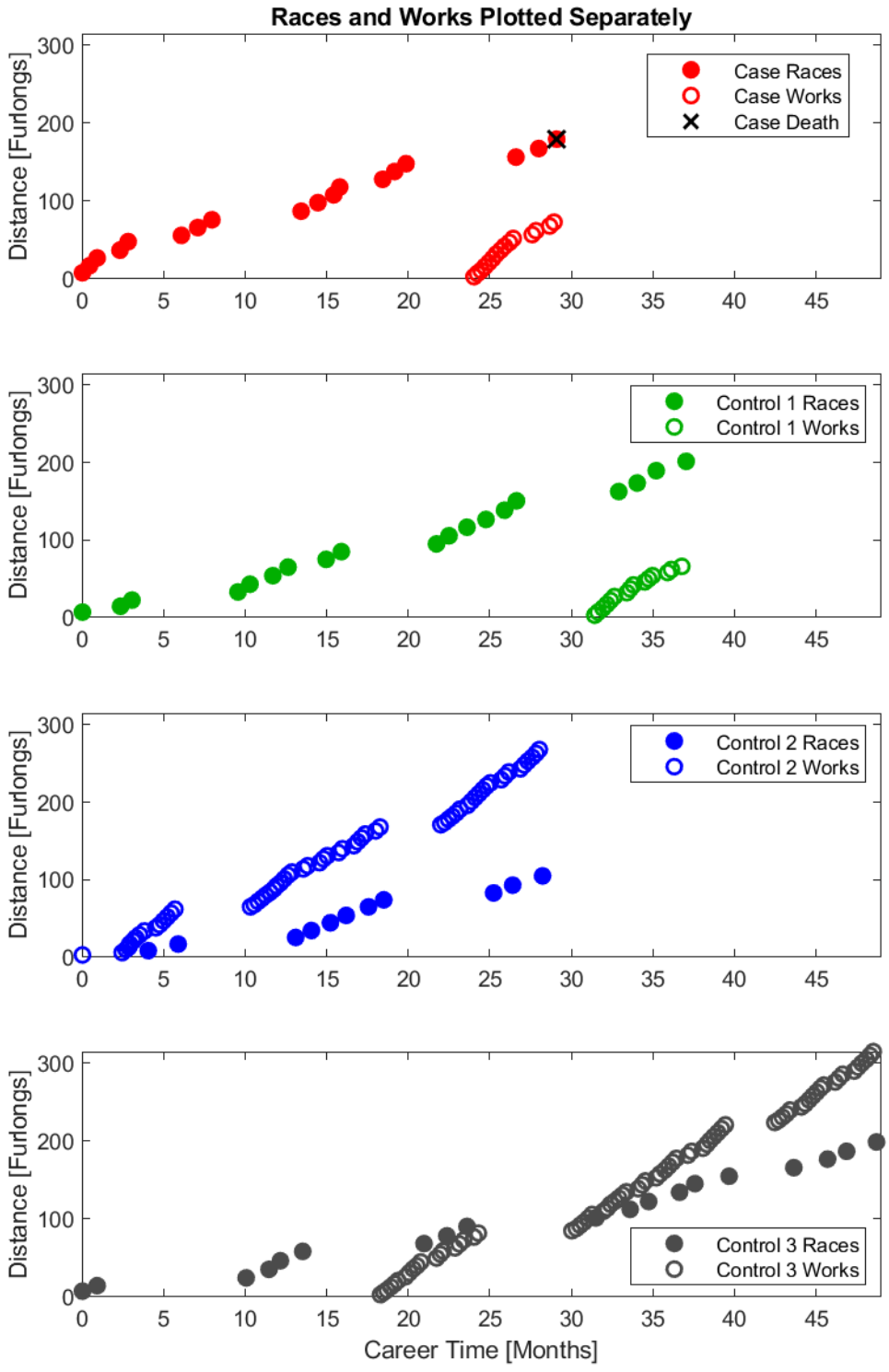


Part 2: Case and Control Horses Plotted Together



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]
Career Time [Months]
Case Races
Case Works
Case Death
98 days
164 days
79 days
125 days
Control 1 Races
Control 1 Works
70 days
195 days
70 days
175 days
144 days
Control 2 Races
Control 2 Works
73 days
133 days
105 days
Control 3 Races
Control 3 Works
274 days
143 days
172 days
84 days


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]

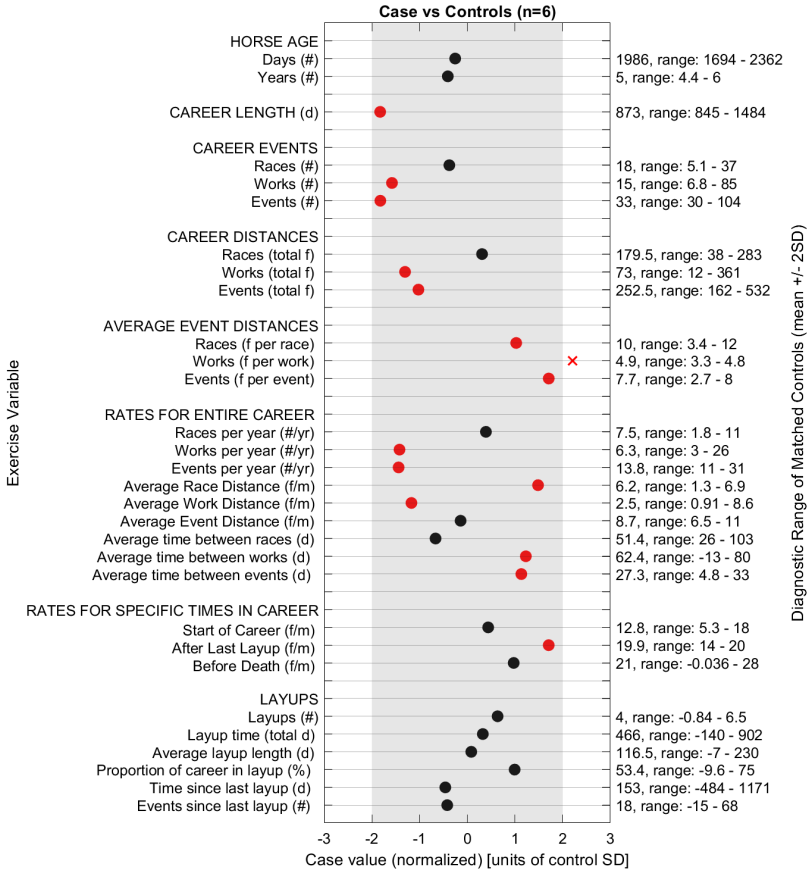
Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/3/2023	R	12.0	SAR	Turf	Firm		4U / FM	GlenFlsG2 -250k	15000	4
7/29/2023	W	5.0	FAI	All Weather Training	Fast	01:02.6				
7/21/2023	W	6.0	FAI	All Weather Training	Fast	01:14.8				
7/1/2023	R	11.0	DEL	Turf	Soft		3U / FM	RGDckMemG3 -250k	150000	1
6/26/2023	W	5.0	FAI	All Weather Training	Fast	01:02.6				
6/19/2023	W	5.0	FAI	All Weather Training	Fast	01:02.6				
5/20/2023	R	8.5	PIM	Turf	Firm		3U / FM	GalorettG3 -100k	20000	2
5/15/2023	W	5.0	FAI	All Weather Training	Fast	01:03.0				
5/8/2023	W	5.0	FAI	All Weather Training	Fast	01:04.4				
4/29/2023	W	5.0	FAI	All Weather Training	Fast	01:02.6				
4/22/2023	W	5.0	FAI	All Weather Training	Fast	01:02.2				
4/14/2023	W	6.0	FAI	All Weather Training	Fast	01:15.0				
4/7/2023	W	5.0	FAI	All Weather Training	Fast	01:02.4				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
3/31/2023	W	5.0	FAI	All Weather Training	Fast	01:02.0				
3/24/2023	W	5.0	FAI	All Weather Training	Fast	01:03.4				
3/17/2023	W	4.0	FAI	All Weather Training	Fast	:50.00				
3/10/2023	W	4.0	FAI	All Weather Training	Fast	:49.60				
3/4/2023	W	3.0	FAI	All Weather Training	Fast	:37.00				
10/30/2022	R	10.0	ROM	Turf	Good		3U / FM	Stk - 298k - G2	59624	2
10/9/2022	R	10.0	MIL	Turf	Soft		3U / FM	Stk - 76k - G3	15215	2
9/17/2022	R	10.0	ROM	Turf	Good		3U / FM	Co22034	1202	4
6/30/2022	R	10.0	MIL	Turf	Good		3U	Stk - 207k - G2	0	6
6/19/2022	R	10.0	MIL	Turf	Good		4U / FM	Stk - 76k - G3	15235	2
5/21/2022	R	11.0	MIL	Turf	Good		4U / FM	Stk - 42k	0	6
4/20/2022	R	11.0	MIL	Turf	Good		4U / FM	Co17802	8092	1
11/7/2021	R	10.0	ROM	Turf	Heavy		3U / FM	Stk - 320k - G2	145586	1
10/12/2021	R	10.0	ROM	Turf	Good to Soft		3U / FM	Stk - 80k - G3	36395	1
9/12/2021	R	8.0	ROM	Turf	Good		3 /F	Co19488	2126	3
6/6/2021	R	11.0	MIL	Turf	Good		3 /F	Stk - 446k - G2	24307	4
5/22/2021	R	10.0	MIL	Turf	Soft		3 /F	Stk - 47k	21317	1
4/10/2021	R	10.0	MIL	Turf	Good		3 /F	Co18328	3666	2

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
3/27/2021	R	9.0	MIL	Turf	Good		3 /F	Maid14271	6487	1
3/14/2021	R	8.0	MIL	Turf	Good		3 /F	Maid14464	2893	2

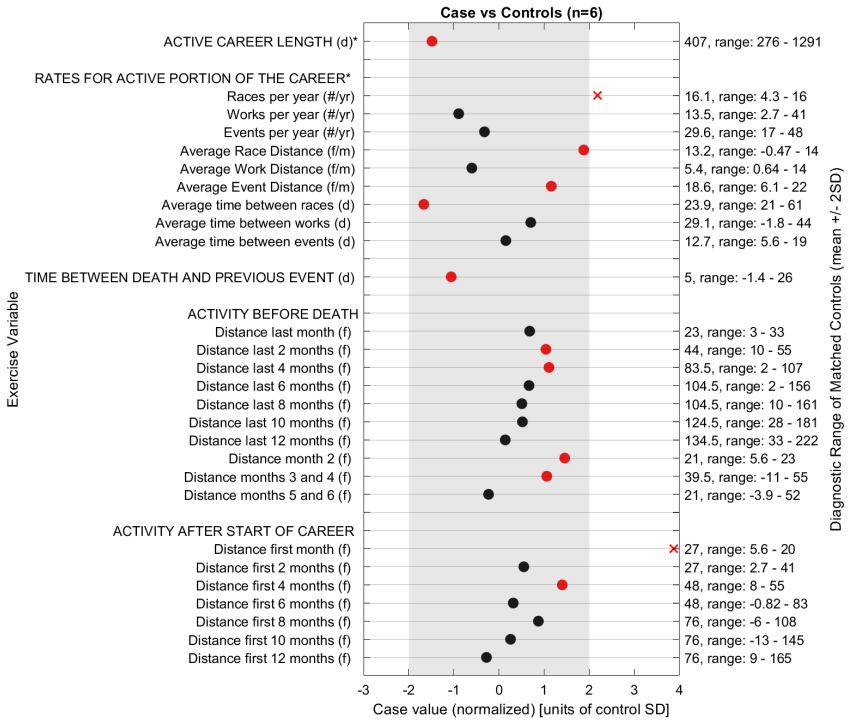
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (5+ year old, female, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 5+ year old, female, Thoroughbreds (n=6) (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 5+ year old, female, Thoroughbreds (n=6) (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.

Exercise History Report (Full)

Winter Son

J. D. Wheat Veterinary Orthopedic Research Laboratory

Sep-25-2023

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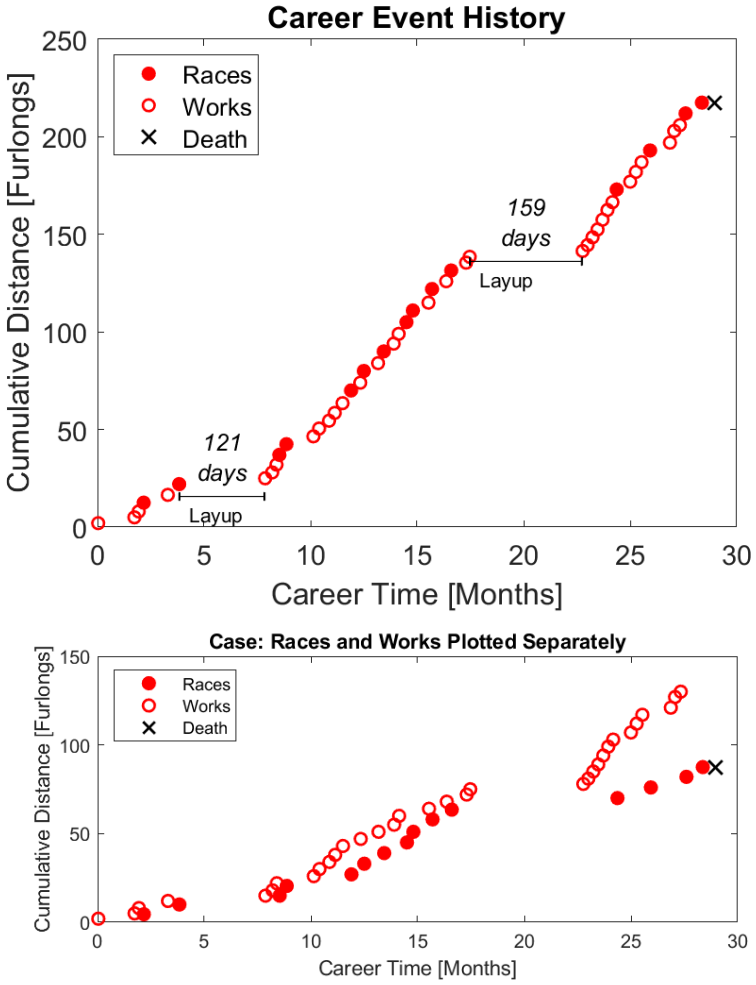
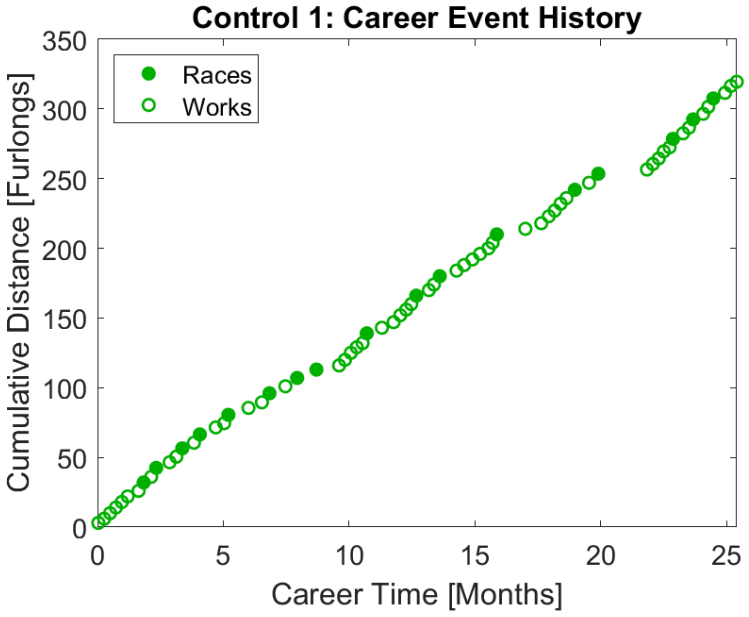
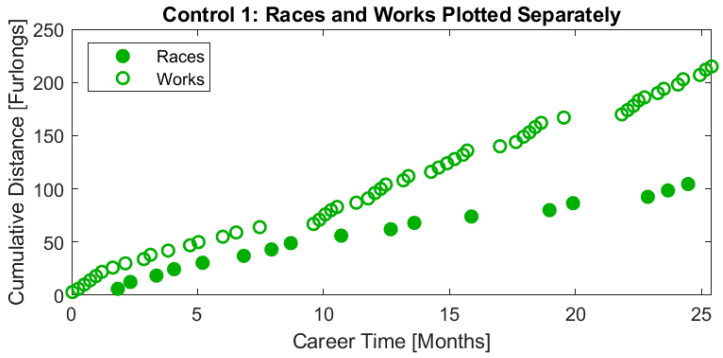
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

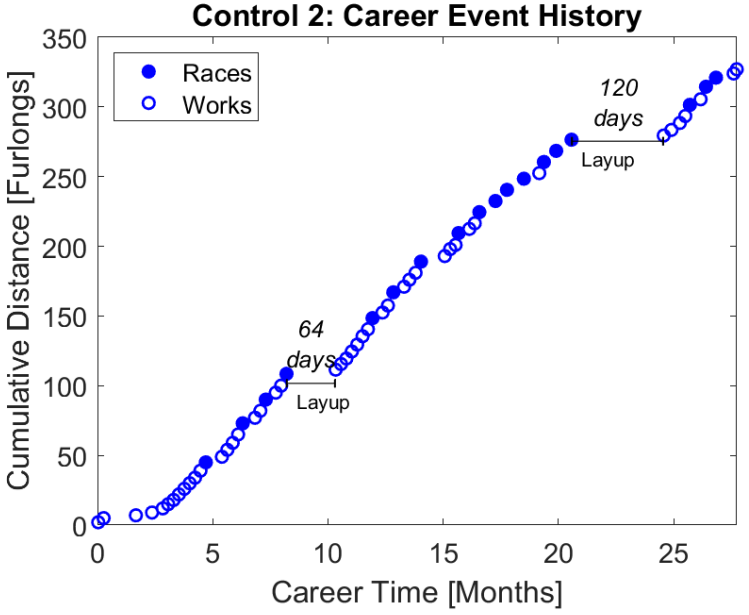


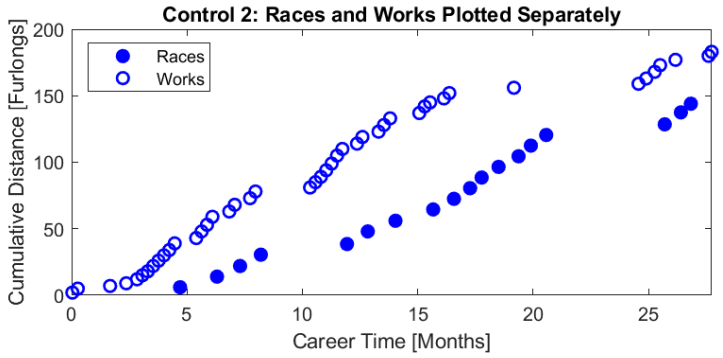
Control 1 High Speed Exercise History



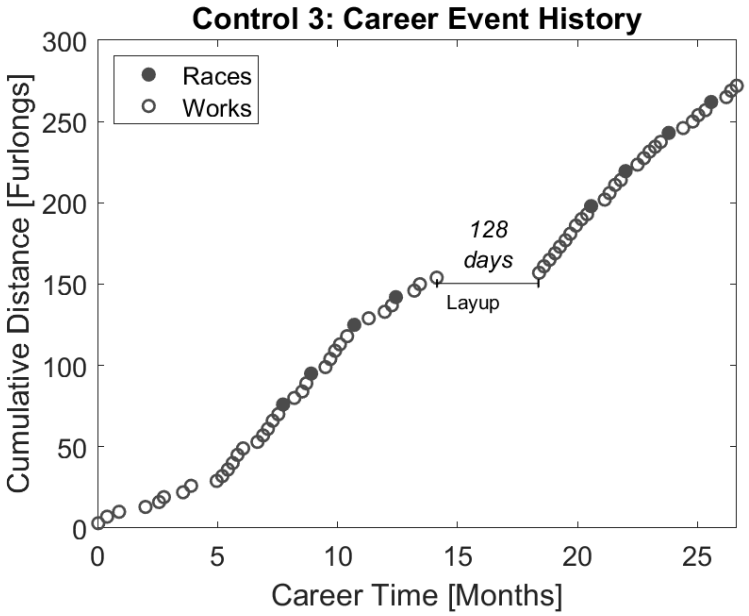


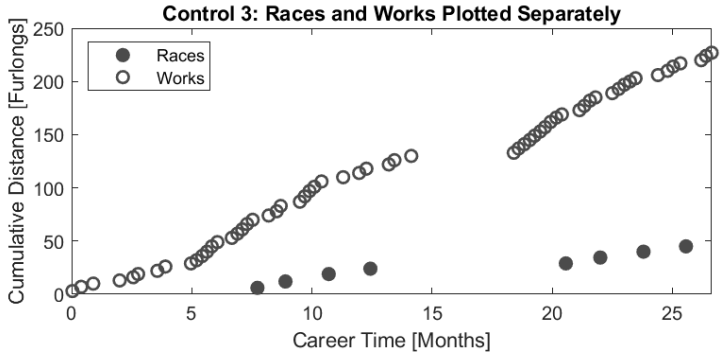
Control 2 High Speed Exercise History



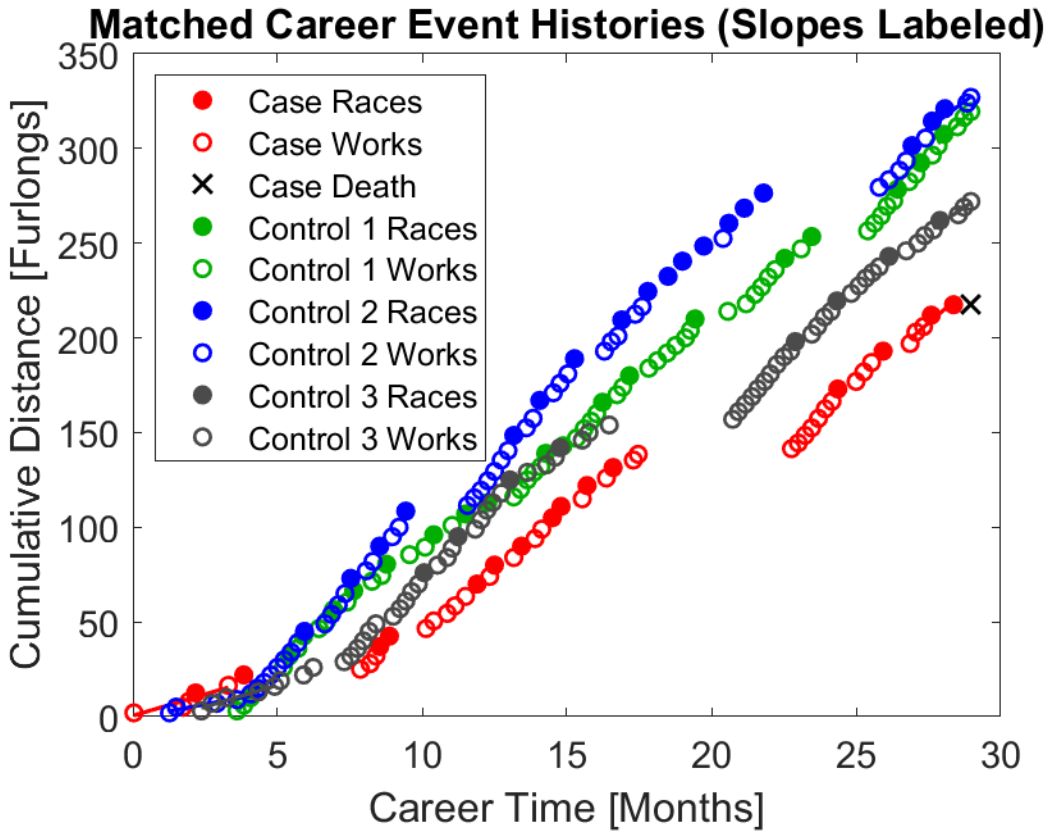


Control 3 High Speed Exercise History

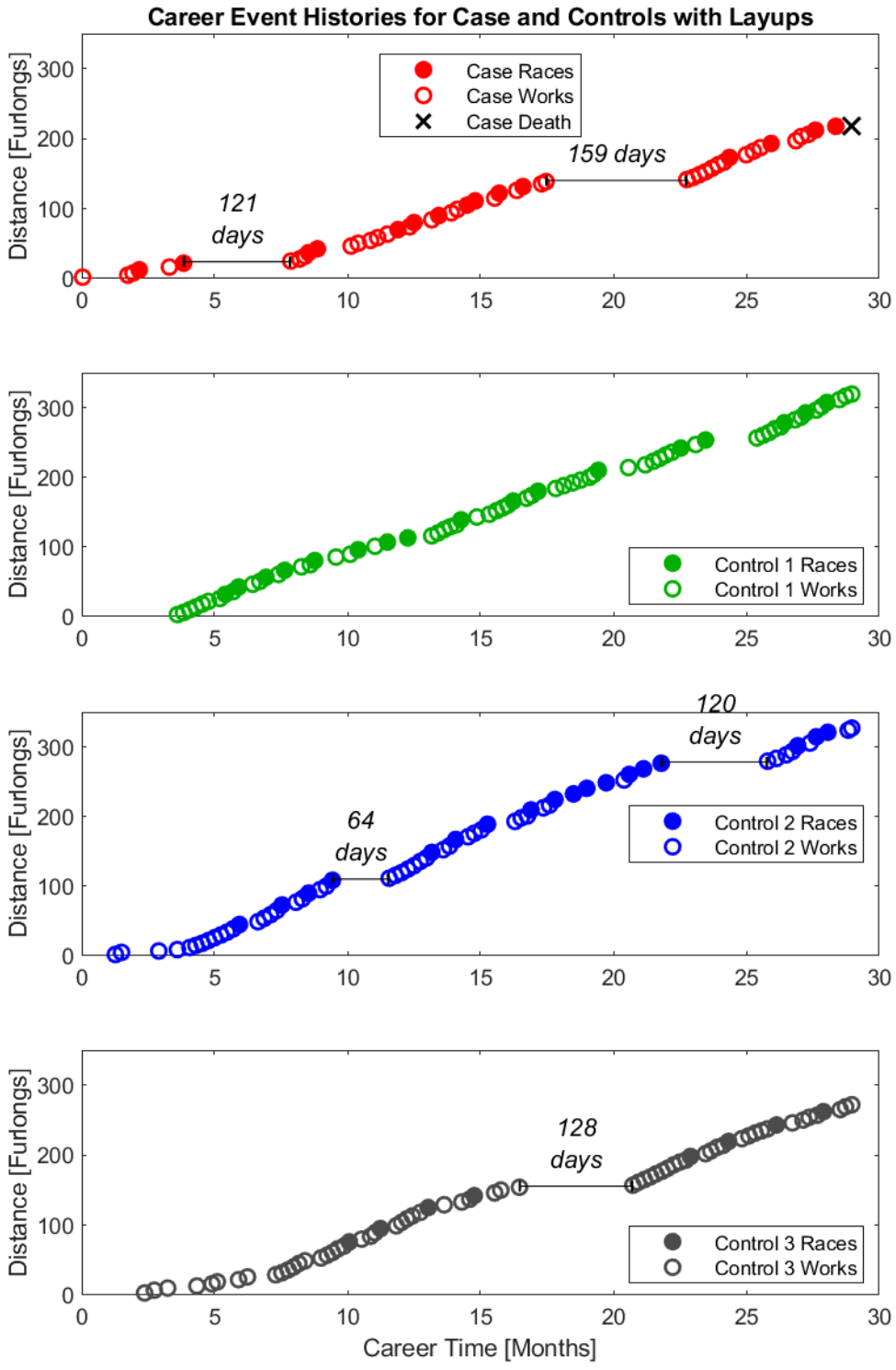


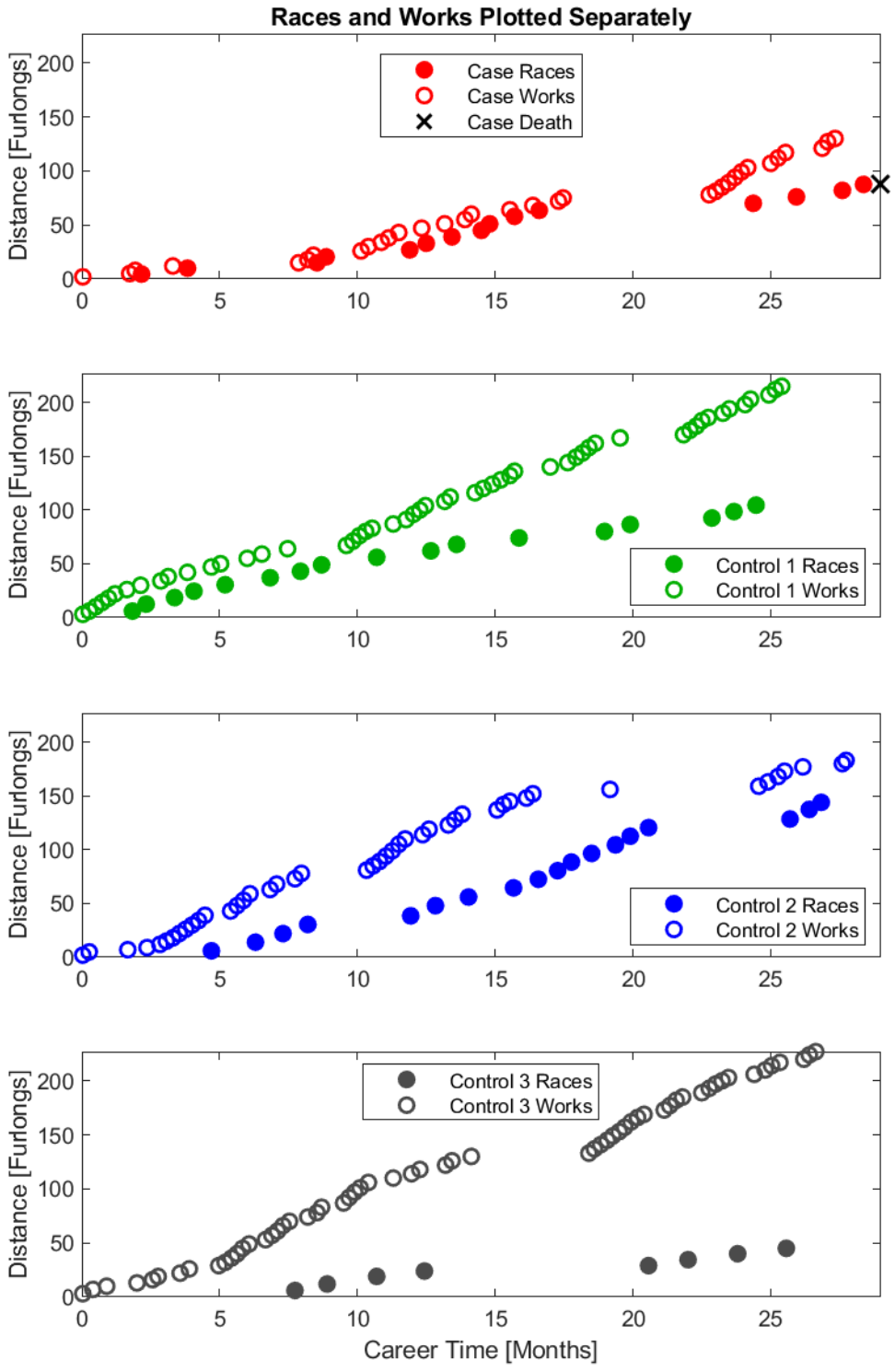


Part 2: Case and Control Horses Plotted Together



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
121 days
159 days
Control 1 Races
Control 1 Works
64 days
120 days
Control 2 Races
Control 2 Works
128 days
Control 3 Races
Control 3 Works
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]

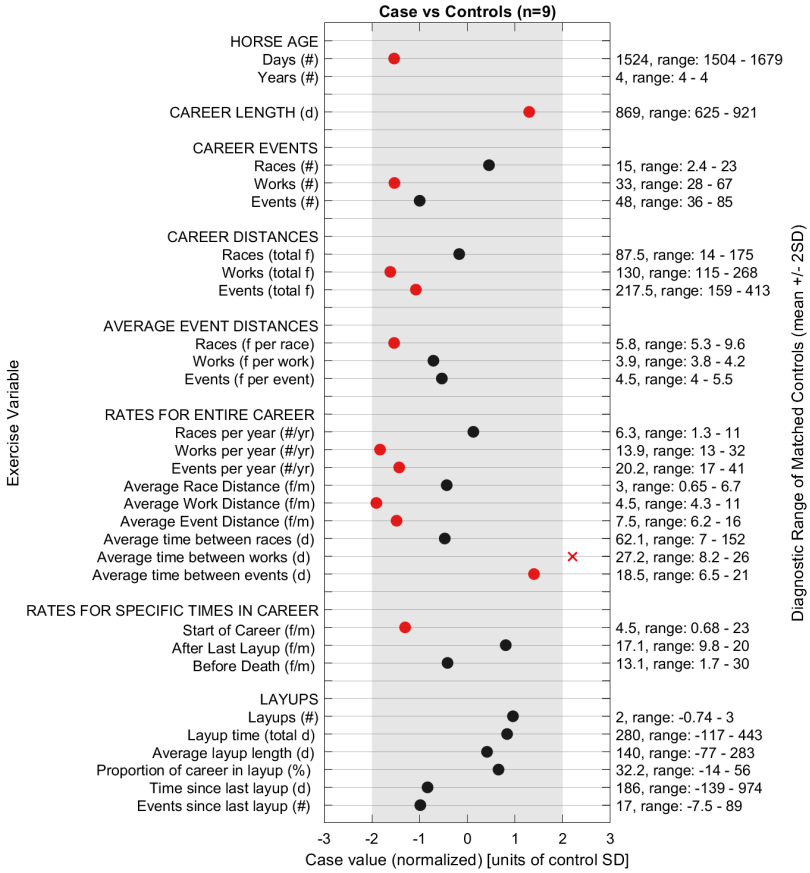
Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
7/2/2023	R	5.5	MTH	Turf	Firm		3U	Alw57500nw1$x	600	6
6/9/2023	R	6.0	BEL	Turf	Firm		3U	Alw95000nw1$x	570	9
6/1/2023	W	3.0	BEL	Dirt training	Fast	:35.70				
5/24/2023	W	6.0	BEL	Dirt training	Fast	01:14.2				
5/18/2023	W	4.0	BEL	Dirt training	Fast	:49.50				
4/20/2023	R	6.0	AQU	Turf	Firm		3U	Alw82000nw1$x	3280	5
4/8/2023	W	5.0	BEL	Dirt training	Fast	01:01.5				
3/31/2023	W	5.0	BEL	Dirt training	Fast	01:02.0				
3/23/2023	W	4.0	BEL	Dirt training	Fast	:47.29				
3/4/2023	R	6.5	AQU	Dirt	Muddy		4U	Alw82000nw1$x	1230	7
2/26/2023	W	4.0	BEL	Dirt training	Fast	:48.42				
2/19/2023	W	5.0	BEL	Dirt training	Fast	01:00.2				
2/12/2023	W	5.0	BEL	Dirt training	Fast	01:01.4				
2/5/2023	W	4.0	BEL	Dirt training	Fast	:50.51				
1/29/2023	W	4.0	BEL	Dirt training	Fast	:49.74				
1/22/2023	W	3.0	BEL	Dirt training	Fast	:38.42				
1/15/2023	W	3.0	BEL	Dirt training	Fast	:40.21				
8/9/2022	W	3.0	SAR	Dirt	Fast	:35.44				

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/4/2022	W	4.0	SAR	Dirt	Fast	:49.66				
7/14/2022	R	5.5	SAR	Turf	Firm		3U	Str50000nw1/x	38500	1
7/7/2022	W	4.0	BEL	Dirt training	Fast	:49.23				
6/17/2022	R	7.0	BEL	Turf	Firm		3U	Str50000nw1/x	900	6
6/12/2022	W	4.0	BEL	Dirt training	Fast	:49.00				
5/21/2022	R	6.0	BEL	Turf	Yielding		3U	Clm30000nw2/L	4920	3
5/12/2022	R	6.0	BEL	Dirt	Fast		3U	Str50000nw1/x	1800	6
5/1/2022	W	5.0	BEL	Dirt	Fast	01:03.2				
4/24/2022	W	4.0	BEL	Dirt training	Fast	:50.11				
4/10/2022	R	6.0	AQU	Dirt	Fast		3	Clm20000-c	2640	4
4/2/2022	W	4.0	BEL	Dirt training	Fast	:49.08				
3/13/2022	R	6.0	AQU	Dirt	Fast		3	SOC 50000/50000	11000	2
3/8/2022	W	4.0	TP	AllWthr	Fast	:48.40				
2/23/2022	R	6.5	TP	AllWthr	Fast		3	Clm30000 (30-20)	1550	4
2/11/2022	W	5.0	TP	AllWthr	Fast	01:02.0				
1/31/2022	W	4.0	TP	AllWthr	Fast	:47.80				
1/23/2022	W	4.0	TP	AllWthr	Good	:49.80				
1/9/2022	W	4.0	TP	AllWthr	Fast	:50.40				
1/1/2022	W	4.0	TP	AllWthr	Fast	:50.00				
11/24/2021	R	5.5	MNR	Dirt	Good		2	Msw	9570	1
11/14/2021	R	5.0	MNR	Dirt	Sloppy		2	Msw	3300	2
11/10/2021	W	4.0	TP	AllWthr	Good	:49.40				
11/4/2021	W	3.0	TP	AllWthr	Good	:36.80				
10/25/2021	W	3.0	BTP	Dirt	Fast	:40.23				
6/26/2021	R	5.5	BEL	Dirt	Fast		2	Msw	2700	6

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
6/10/2021	W	4.0	ATC	Dirt	Fast	:53.00				
5/7/2021	R	4.5	CD	Dirt	Fast		2	Mcl50000	1254	5
4/30/2021	W	3.0	TTC	Dirt	Muddy	:37.60				
4/24/2021	W	3.0	TTC	Dirt	Fast	:37.80				
3/4/2021	W	2.0	ATC	Dirt	Fast	:25.30				

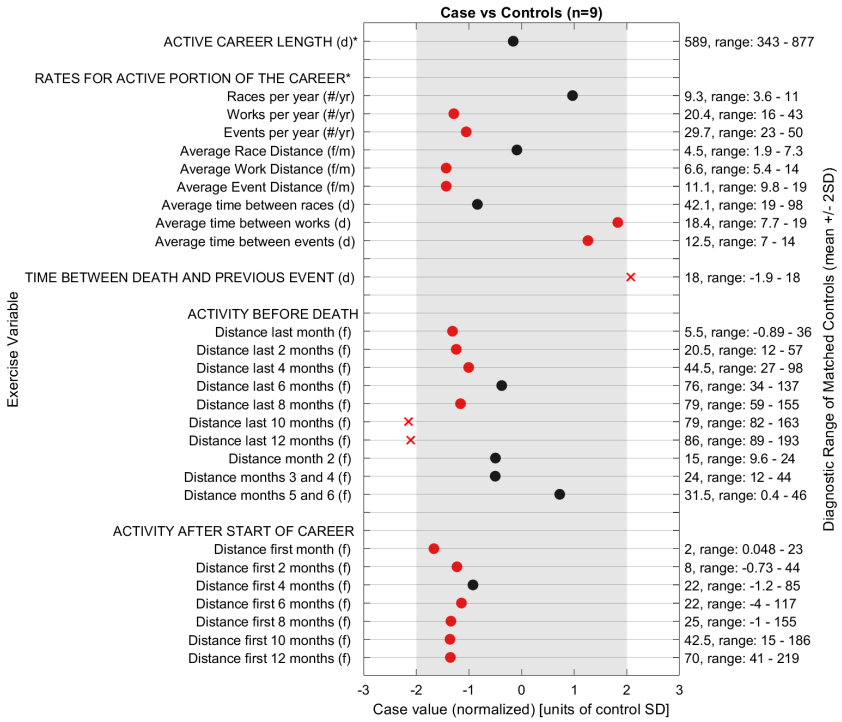
Part 4: Comparison of Exercise Variables between Case Horse and 9 Control Horses (4 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 4 year old, male, Thoroughbreds (n=9) (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=9) (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.

Exercise History Report (Full)
Wisecraken

Sep-25-2023

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).

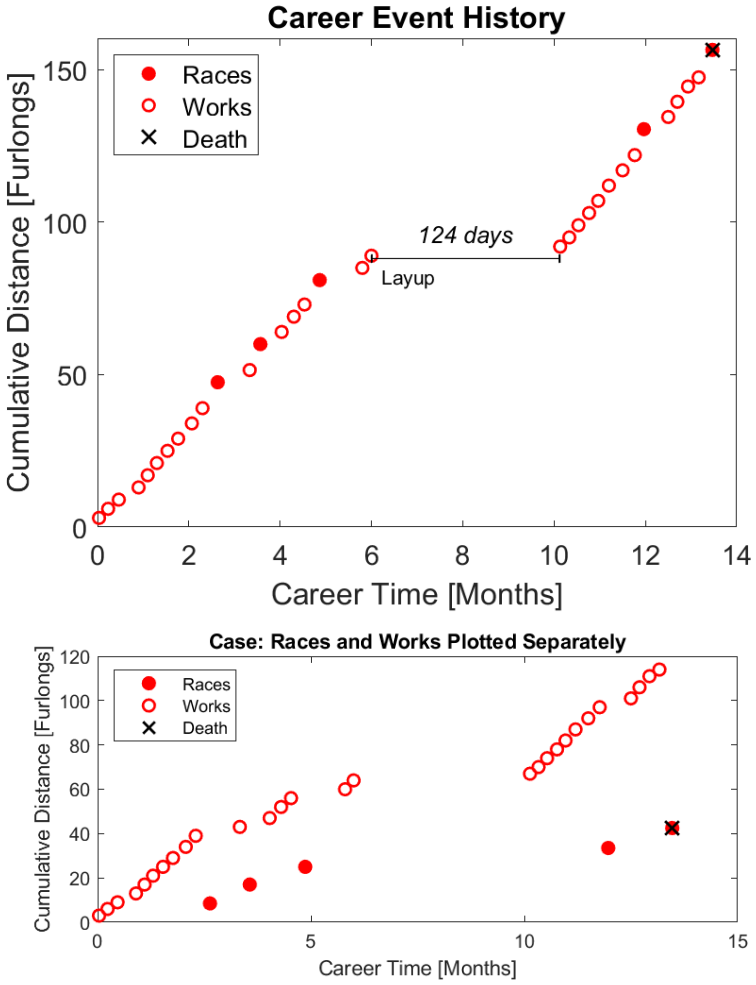
Part 4 is a chart that allows comparison of exercise variables between Case Horse and other racehorses of similar age, sex, and breed that did not die at the same time from an injury. Similar to comparing the results of a blood test to a range of normal values, the values for Case Horse can be assessed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

Table of Contents

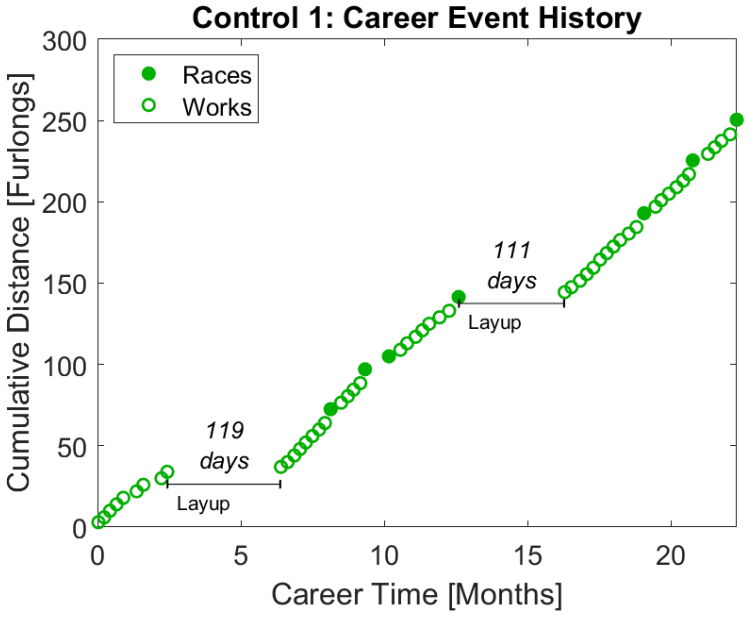
Part 1: Graphical Representation of Individual High-Speed Exercise Histories

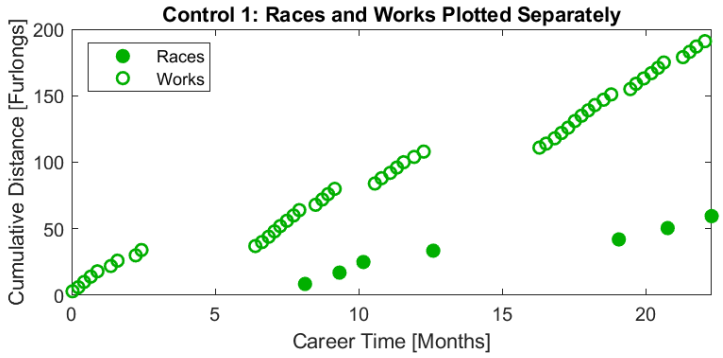
Races (filled circles), officially timed high-speed works (open circles), layups (line with endcaps, periods of time greater than 60 days in length without a race or timed work), and time of death (X) are illustrated over time (Career Time in months). With each event (race or work), the number of furlongs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

Case Horse High Speed Exercise History

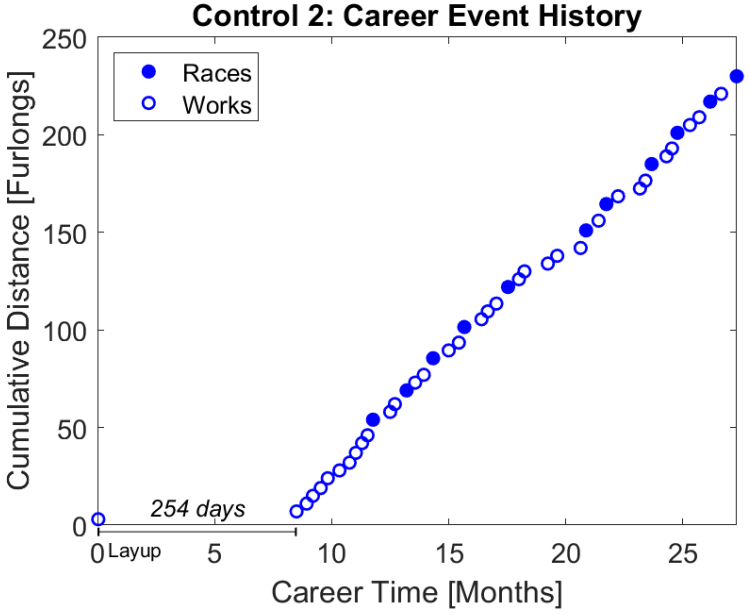


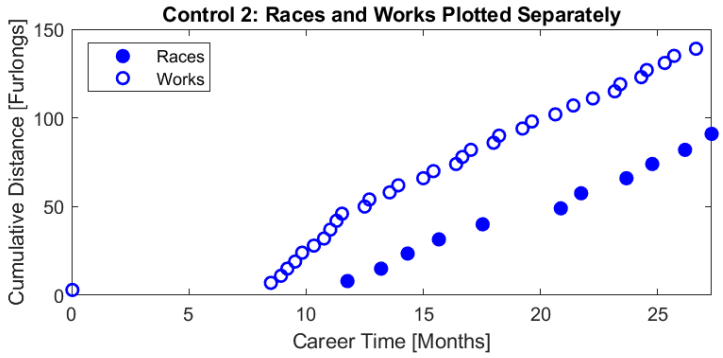
Control 1 High Speed Exercise History



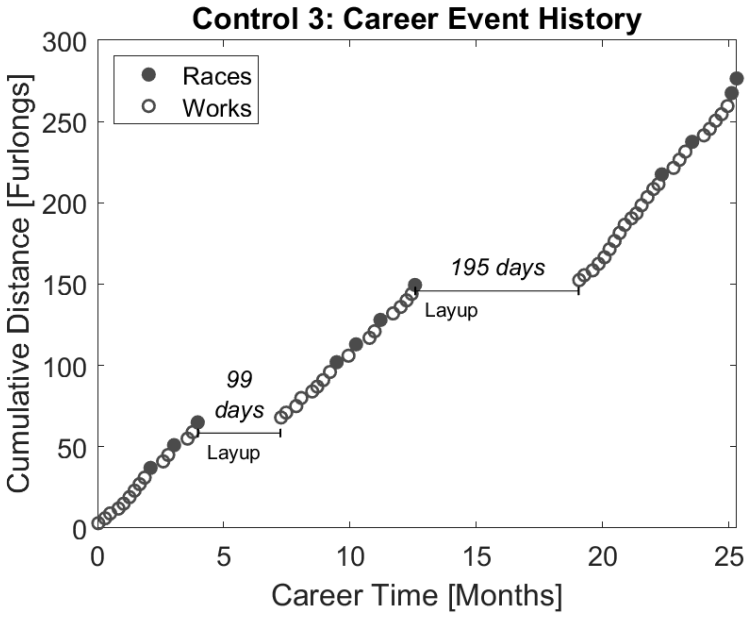


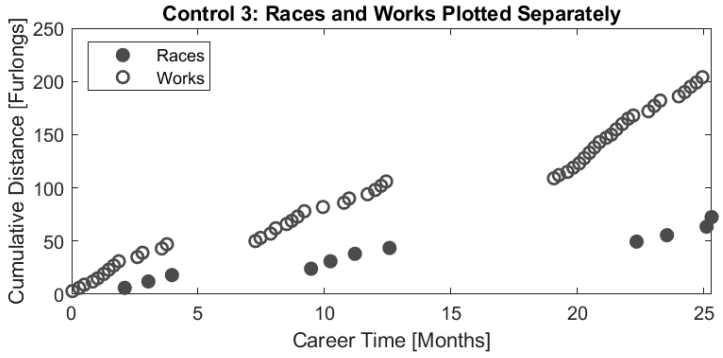
Control 2 High Speed Exercise History



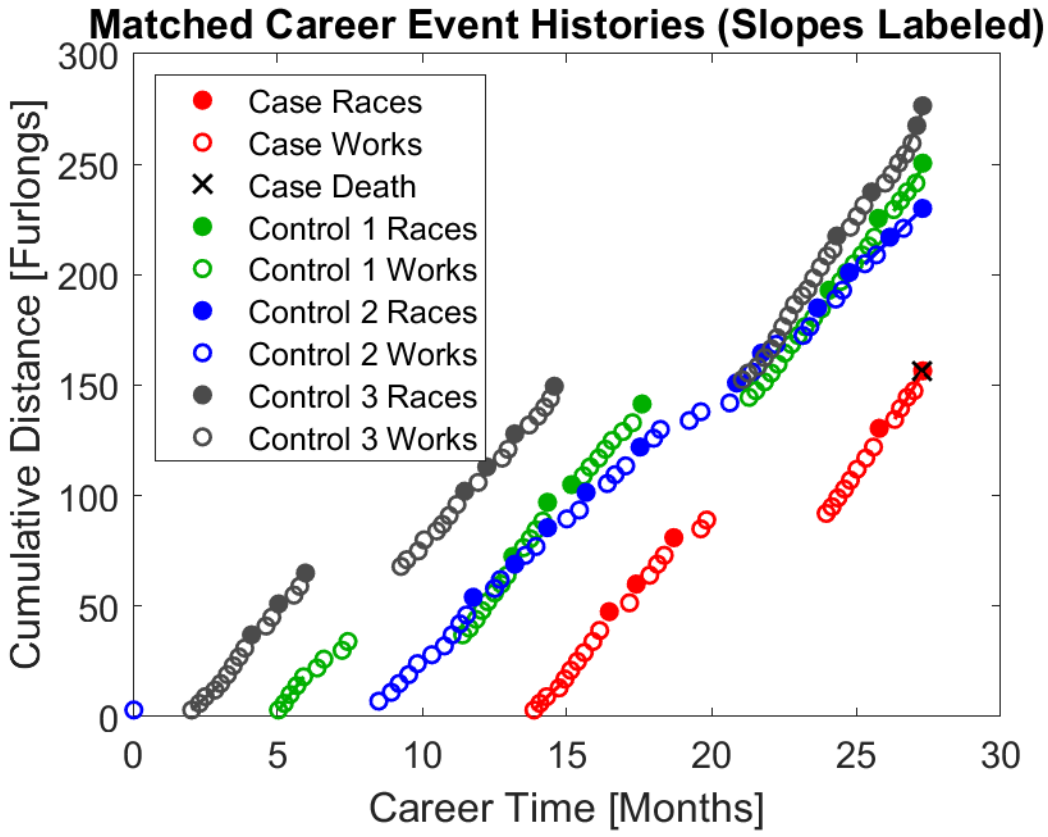


Control 3 High Speed Exercise History

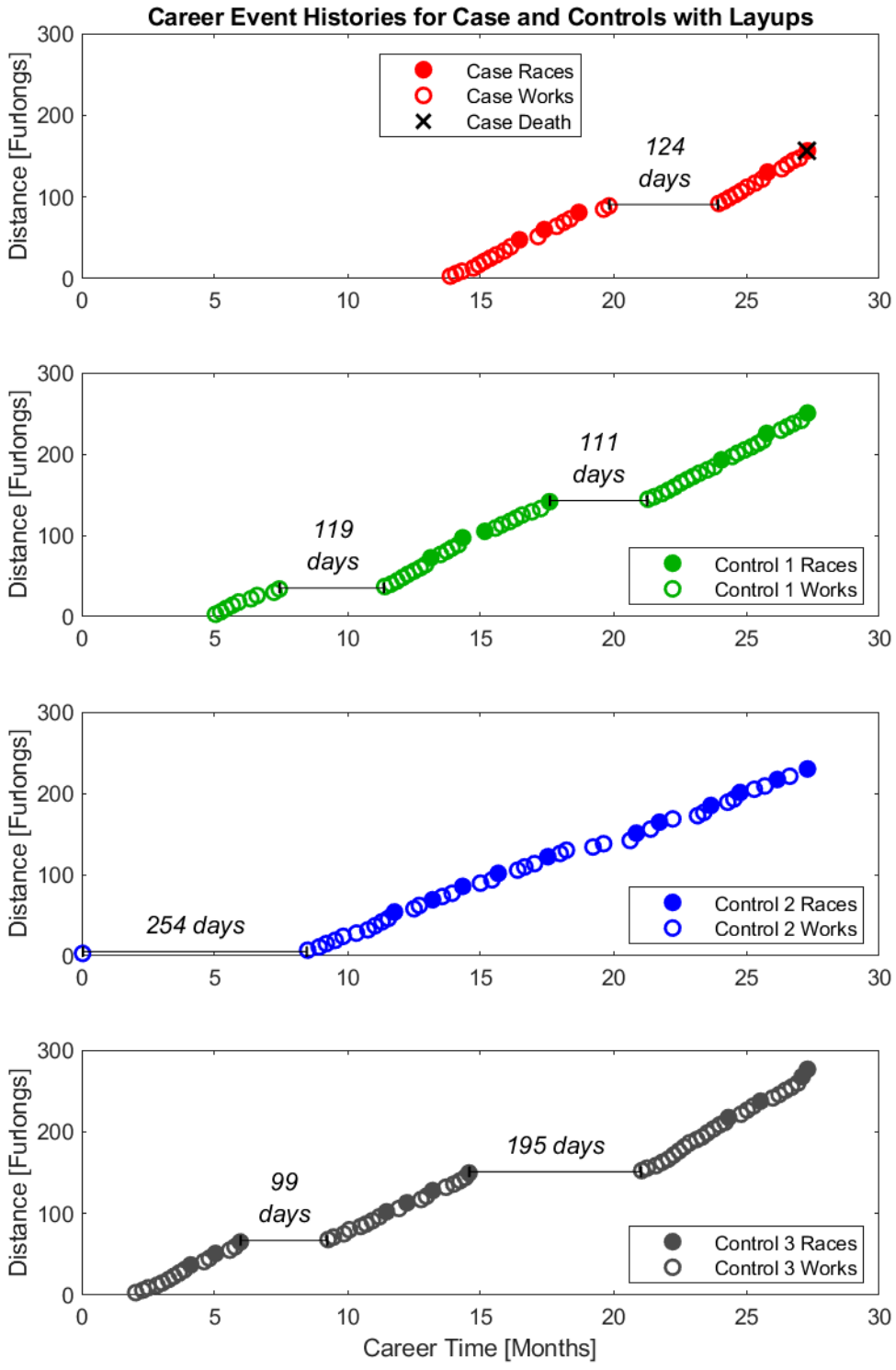


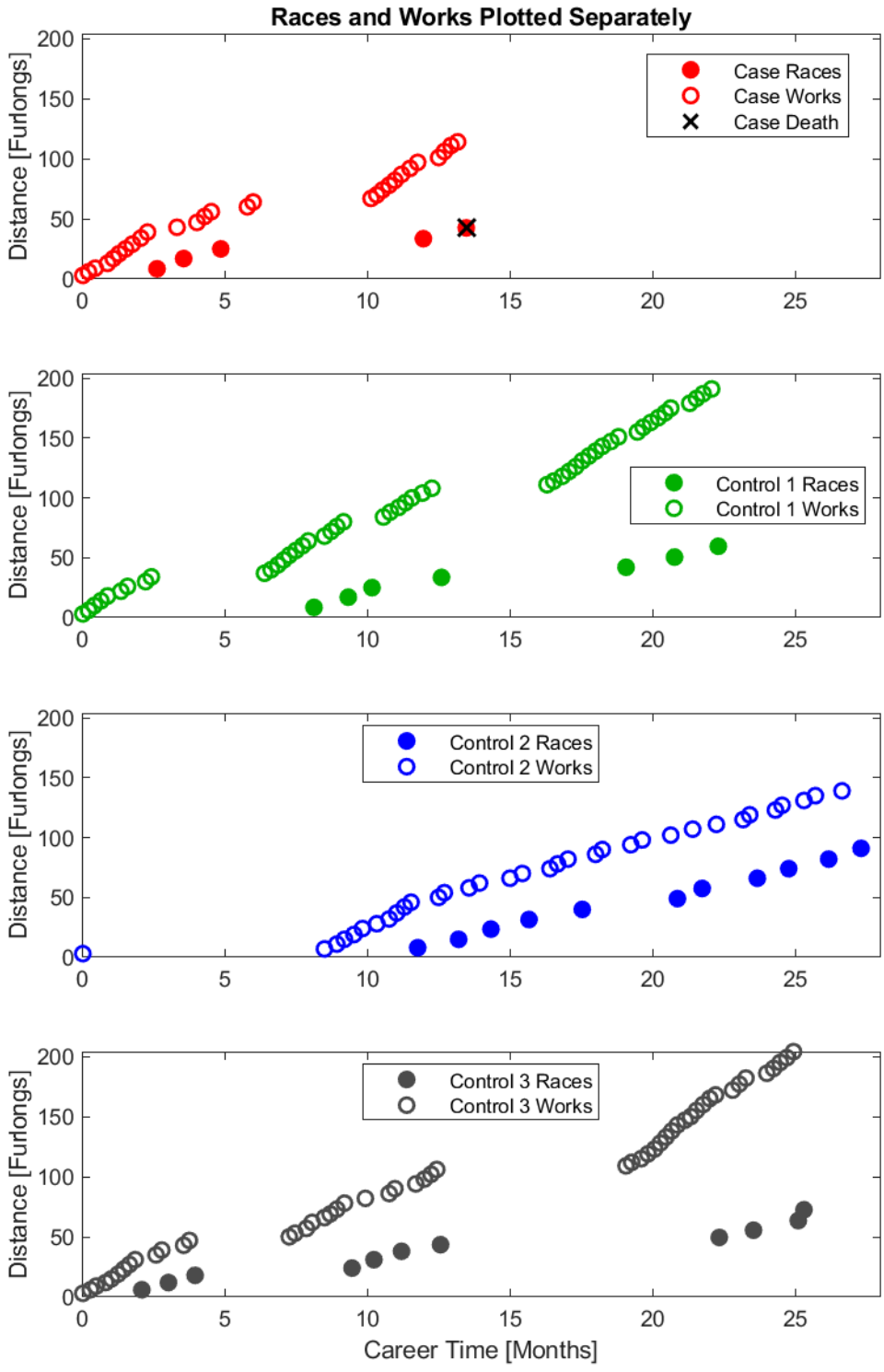


Part 2: Case and Control Horses Plotted Together



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]
Career Time [Months]
Case Races
Case Works
Case Death
124 days
Control 1 Races
Control 1 Works
119 days
111 days
Control 2 Races
Control 2 Works
254 days
Control 3 Races
Control 3 Works
99 days
195 days

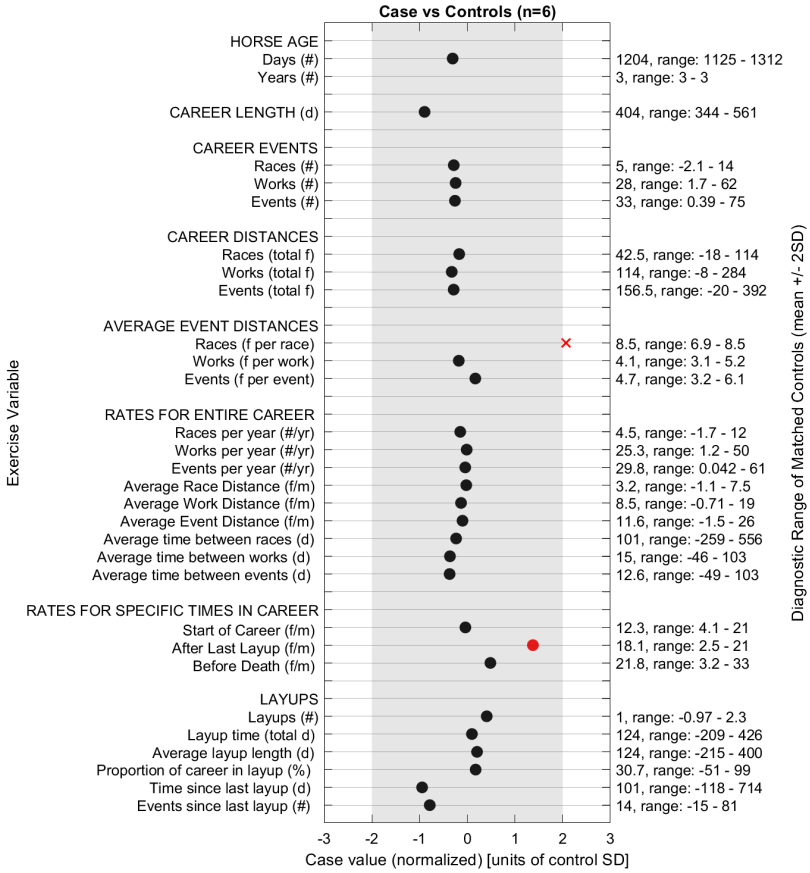

Races and Works Plotted Separately
Distance [Furlongs]
Case Races
Case Works
Case Death
Control 1 Races
Control 1 Works
Control 2 Races
Control 2 Works
Control 3 Races
Control 3 Works
Career Time [Months]

Part 3: Case Horse's Event History

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
8/16/2023	R	9.0	SAR	Turf	Good		3U	Str50000nw1/ x	0	9
8/7/2023	W	3.0	SAR	Dirt training	Fast	:37.77				
7/31/2023	W	5.0	BEL	Dirt training	Fast	01:03.8				
7/24/2023	W	5.0	BEL	Dirt	Fast	01:02.7				
7/18/2023	W	4.0	BEL	Dirt	Fast	:47.00				
7/2/2023	R	8.5	BEL	Turf	Firm		3U	Mcl40000	25850	1
6/26/2023	W	5.0	BEL	Dirt training	Fast	01:02.0				
6/18/2023	W	5.0	BEL	Dirt	Fast	01:02.9				
6/9/2023	W	5.0	BEL	Dirt	Fast	01:01.8				
6/2/2023	W	4.0	BEL	Dirt	Fast	:48.55				
5/27/2023	W	4.0	BEL	Dirt	Fast	:48.56				
5/20/2023	W	4.0	BEL	Dirt	Fast	:52.12				
5/14/2023	W	3.0	BEL	Dirt	Fast	:37.33				
5/8/2023	W	3.0	BEL	Dirt	Fast	:39.33				
1/4/2023	W	4.0	BEL	Dirt training	Fast	:50.66				
12/29/2022	W	4.0	BEL	Dirt training	Fast	:52.02				
12/1/2022	R	8.0	AQU	Dirt	Good		2	Mcl75000	810	6
11/21/2022	W	4.0	BEL	Dirt training	Fast	:48.00				
11/14/2022	W	5.0	BEL	Dirt training	Fast	01:02.0				
11/6/2022	W	4.0	BEL	Dirt training	Fast	:49.29				
10/23/2022	R	8.5	BAQ	Turf	Firm		2	Msw	570	8
10/16/2022	W	4.0	BEL	Dirt training	Fast	:48.90				
9/25/2022	R	8.5	BAQ	Turf	Firm		2	Msw	570	10

Date	Race/ Work	Fur-longs	Track	Surface	Track Cond.	Time	Age/ Sex	Race Class	Earn-ings	Finish
9/15/2022	W	5.0	BEL	Dirt training	Fast	01:01.4				
9/8/2022	W	5.0	BEL	Dirt training	Fast	01:02.0				
8/30/2022	W	4.0	BEL	Dirt training	Fast	:49.00				
8/23/2022	W	4.0	BEL	Dirt training	Fast	:48.85				
8/16/2022	W	4.0	BEL	Dirt training	Fast	:51.00				
8/10/2022	W	4.0	BEL	Dirt	Fast	:49.49				
8/4/2022	W	4.0	BEL	Dirt	Fast	:50.13				
7/22/2022	W	3.0	BEL	Dirt	Fast	:36.80				
7/15/2022	W	3.0	BEL	Dirt training	Fast	:39.90				
7/9/2022	W	3.0	BEL	Dirt training	Fast	:39.96				

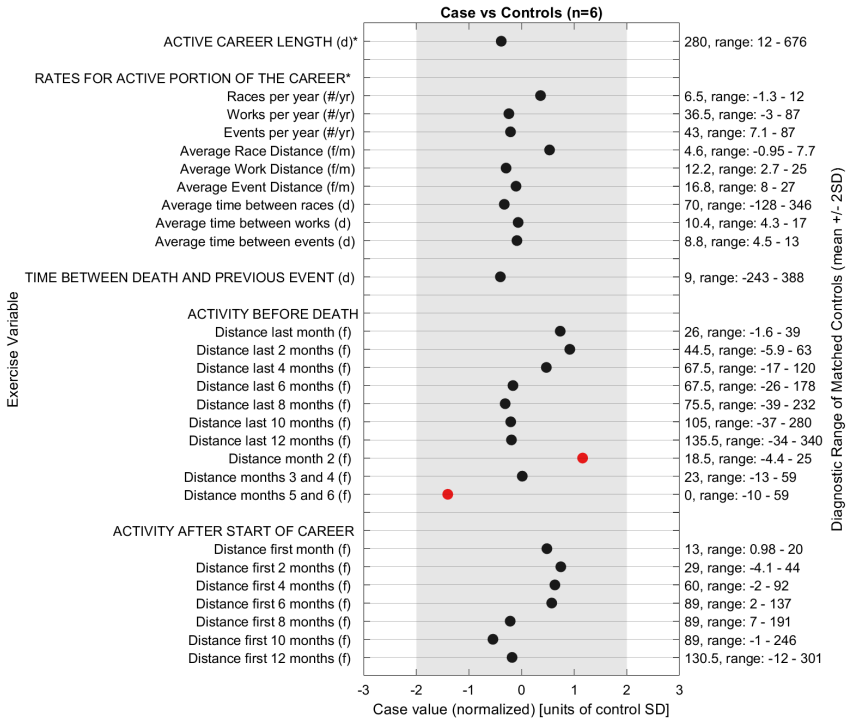
Part 4: Comparison of Exercise Variables between Case Horse and 6 Control Horses (3 year old, male, Thoroughbred)



Case Horse values are indicated by black or red symbols: circles indicate values considered normal for 95% of 3 year old, male, Thoroughbreds (n=6) (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.



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