

VETERINARY MEDICAL DIAGNOSTIC PROGRAM

JANUARY 1, 2016 TO DECEMBER 31, 2016



Supported by the
Oklahoma Horse Racing Commission



Oklahoma-Breeding Development Program



Conducted by the
Oklahoma Animal Disease Diagnostic Laboratory
Center for Veterinary Health Sciences
Stillwater, OK
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CENTER FOR VETERINARY HEALTH SCIENCES
Healthy Animals — Healthy People

Veterinary Medical Diagnostic Program

Supported by: **The Oklahoma Horse Racing Commission (OHRC)**

Conducted by: **The Oklahoma Animal Disease Diagnostic Laboratory (OADDL)**
Center for Veterinary Health Sciences
Oklahoma State University

Reporting Period: **January 1, 2016 through December 31, 2016**

Summary of Necropsy Findings for Race Horses Submitted to OADDL in 2016

This report summarizes the case submissions and diagnostic findings of the Veterinary Medical Diagnostic Program for calendar year 2016. A total of thirty-eight (38) horses were submitted from Oklahoma racetracks to the OADDL. This represents the fewest number of horses submitted for any year in the 2004-2016 time period. The catastrophic musculoskeletal injury (CMI) index is used to normalize the number of fatal musculoskeletal injuries to the number of horses that race. The nationwide CMI index for 2016 was 1.54. The overall CMI index for all Oklahoma race horses in 2016 was 1.38, with Oklahoma Thoroughbreds slightly higher than the national average at 1.92.

The peak months for submission of horses to OADDL were April and September. Quarter Horse (QH) and Thoroughbred (TB) breeds accounted for all of the horses submitted (15 QH and 23 TB submissions). Of the QH submissions, 12 were males and 3 were females. Of the TB submissions, 13 were males and 10 were females. The most common age was 3 years old (32%), followed by 2 years old (29%).

The majority of fatalities (~68%) occurred on race day with an additional 26% related to training activities. In 2016, 92% (35/38) of the submissions were attributed to musculoskeletal system injury sustained during racing or training. Exercise-induced pulmonary hemorrhage (EIPH) was confirmed as the cause of death of one horse on race day. Injuries to the forelimbs accounted for 93% of the fatalities, with nearly equal distribution between the right and left forelimbs. Distal forelimb injuries accounted for 67% of the total fatal musculoskeletal injuries. Carpal fractures were the most common distal forelimb injuries, followed by equal numbers of fetlock failures and third metacarpal (cannon bone) fractures.

Only 2/38 (5%) of the fatalities were due to non-exercise related activities or natural diseases, including one horse with ileus/colitis and another horse with equine protozoal myeloencephalitis (EPM). Gastric ulcers were identified in the stomachs of 55% of the horses at necropsy, with the majority of the ulcers (57%) of mild severity.

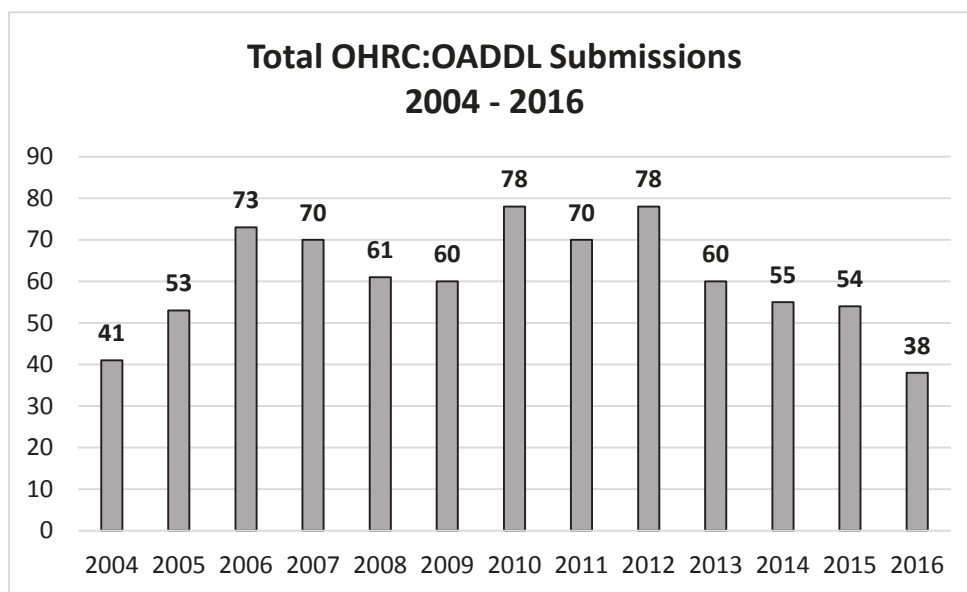


Table 1: Monthly Distribution of Necropsy Submissions in 2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
REM	0	1	2	8	2	0	0	2	6	1	5	3	30
FMT	0	0	0	0	0	2	1	0	0	0	0	0	3
WRD	1	0	0	0	2	0	1	0	0	1	0	0	5
Totals	1	1	2	8	4	2	2	2	6	2	5	3	38

Table 2: Monthly Distribution of Necropsy Submissions by Breed in 2016

Breed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
TB	1	0	0	0	2	2	1	2	6	1	5	3	23
QH	0	1	2	8	2	0	1	0	0	1	0	0	15
Totals	1	1	2	8	4	2	2	2	6	2	5	3	38

Table 3: Gender and Breed of Necropsy Submissions in 2016

		REM	FMT	WRD	Totals
Male	TB	4	0	0	4
	QH	3	0	1	4
Female	TB	6	1	3	10
	QH	3	0	0	3
Gelding	TB	7	2	0	9
	QH	7	0	1	8
Totals		30	3	5	38

Table 4: Age and Breed of Necropsy Submissions in 2016

Age (Years) & Breed		REM	FMT	WRD	Totals
2	TB	6	0	0	6
	QH	5	0	0	5
3	TB	8	0	0	8
	QH	3	0	1	4
4	TB	4	0	1	5
	QH	3	0	0	3
5	TB	0	2	1	3
	QH	1	0	1	2
6	TB	0	0	1	1
	QH	0	0	0	0
8	TB	0	1	0	1
	QH	0	0	0	0
Totals		30	3	5	38

Table 5: Fatal Event by Age of Necropsy Submissions in 2016

Age (Years)	Racing	Training	Non-exercise	Totals
2	4	6	1	11
3	11	0	1	12
4	5	3	0	8
5	4	1	0	5
6	1	0	0	1
8	1	0	0	1
Totals	26	10	2	38

Table 6: Fatal Event by Breed of Necropsy Submissions in 2016

Breed	Racing	Training	Non-exercise	Totals
TB	16	6	1	23
QH	10	4	1	15
Totals	26	10	2	38

Table 7: Fatal Event by Track for Necropsy Submissions in 2016

Track	Racing	Training	Non-exercise	Totals
REM	21	8	1	30
FMT	3	0	0	3
WRD	2	2	1	5
Totals	26	10	2	38

Table 8: Fatal Event by Breed and Track for Necropsy Submissions in 2016

			REM	FMT	WRD	Totals
RACE DAY	Before Race	TB	1	0	0	1
		QH	0	0	0	0
	During Race	TB	11	3	1	15
		QH	8	0	1	9
	After Race	TB	0	0	0	0
		QH	1	0	0	1
TRAINING		TB	4	0	2	6
		QH	4	0	0	4
NON-EXERCISE		TB	1	0	0	1
		QH	0	0	1	1
TOTALS			30	3	5	38

Table 9: Cause of Death by Track for Necropsy Submissions in 2016

		REM	FMT	WRD	Totals
MUSCULOSKELETAL INJURY	Racing	20	3	2	25
	Training	8	0	2	10
EXERCISE-INDUCED PULMONARY HEMORRHAGE (EIPH)		1	0	0	1
NON-EXERCISE		1	0	1	2
Totals		30	3	5	38

Table 10: Limb Injuries by Breed and Racing (R) or Training (T) in 2016

Location of Injury		REM		FMT		WRD		Totals	
		R	T	R	T	R	T	R	T
Right Front	TB	5	0	2	0	1	2	8	2
	QH	3	1	0	0	0	0	3	1
Left Front	TB	4	2	1	0	0	0	5	2
	QH	3	2	0	0	1	0	4	2
Both Front	TB	0	0	0	0	0	0	0	0
	QH	1	0	0	0	0	0	1	0
Right Hind	TB	1	0	0	0	0	0	1	0
	QH	0	0	0	0	0	0	0	0
Left Hind	TB	0	1	0	0	0	0	0	1
	QH	0	0	0	0	0	0	0	0
Totals		17	6	3	0	2	2	22	8

Table 11: All Fatal Injuries during Racing or Training by Track in 2016

Injury		REM		FMT		WRD		Totals	
		TB	QH	TB	QH	TB	QH	TB	QH
Carpal Fracture		4	5	1	0	1	0	6	5
Fetlock Failure	Single Sesamoid	1	0	0	0	0	1	1	1
	Biaxial Sesamoid	1	1	1	0	1	0	3	1
3 rd Metacarpus (Cannon)	Diaphysis	1	1	1	0	0	0	2	1
	Distal Condyle	2	0	0	0	1	0	3	0
Vertebrae	Cervical	0	1	0	0	0	0	0	1
	Thoracic	1	0	0	0	0	0	1	0
	Lumbosacral	0	1	0	0	0	0	0	1
Tibia		2	0	0	0	0	0	2	0
Skull		2	0	0	0	0	0	2	0
Scapula		0	1	0	0	0	0	0	1
Humerus		1	0	0	0	0	0	1	0
Ulna		0	1	0	0	0	0	0	1
1 st Phalanx (P1 front)		1	0	0	0	0	0	1	0
Flexor Tendon Laceration		0	1	0	0	0	0	0	1
EIPH		0	1	0	0	0	0	0	1
Totals		16	13	3	0	3	1	22	14

Table 12: Race Fatality by Track Location for Necropsy Submissions in 2016

	REM	FMT	WRD	Total
At Finish/Past Finish	8	1	1	10
Home Stretch	1	2	1	4
Far Turn	2	0	0	2
1/16 Pole	2	0	2	2
Near Turn	2	0	2	2
Grandstands-unsaddling	1	0	0	1
50 yards before wire	1	0	0	1
Back Stretch	1	0	0	1
1/4 Pole	1	0	0	1
At/Out of Starting Gate	1	0	0	1
In Saddling Paddock	1	0	1	1
Totals	21	3	2	26

Table 13: Hoof Anatomy and Horse Shoe Characteristics in 2016

		TB	QH	Totals
Toe Grabs	No toe grabs on front	22	0	22
	Front < 5 mm	1 (1 shoe)	11	12
	Front > 5 mm	0	4	4
	Hind < 5 mm	8	0	8
	Hind > 5 mm	7	14	21
Hind Shoes Not Examined		7	1	8
No Shoes on Hind		1	0	1
Long Toe/Low Heel	Normal toe/heel	4	3	7
	Mild	8	9	17
	Moderate	8	3	11
	Marked	3	0	3
	Not reported	0	0	0
Under-Run heels	Normal heel	5	4	9
	Mild	8	6	14
	Moderate	7	5	12
	Marked	3	0	3
	Not reported	0	0	0
Squared toe/Dubbed Toe		5	4	9
Abnormal Growth Lines				
Hoof Wall Quality		2	2	4
Symmetry/Imbalance				
Rim Pads		2	1	3
Front Quarter Crack		1	0	1
Toe clips		1	0	1
Hind Heel Caulks		1	0	1

Table 14: Gastric Ulcers Identified During Necropsy Submission in 2016

	TB	QH	Totals
None	10	7	17
Mild	8	4	12
Moderate	5	3	8
Marked	0	1	1
Totals	23	15	38

Table 15: Race Day Fatality by Class of Race & Breed in 2016

		REM		FMT		WRD		Totals	
		TB	QH	TB	QH	TB	QH	TB	QH
Maiden claiming		4	0	0	0	1	0	5	0
Claiming	\$0-\$4999	0	0	0	0	0	0	0	0
	\$5000-\$7499	1	0	0	0	0	0	1	0
	\$7500-\$9999	1	0	0	0	1	0	2	0
	\$10,000-\$19,999	3	1	3	0	0	0	6	1
	\$20,000-up	3	1	0	0	0	0	3	1
Futurity/Derby Trial		0	2	0	0	0	0	0	2
Allowance		1	2	0	0	0	1	1	3
Stakes		0	1	0	0	0	0	0	1
Maiden Race		3	2	0	0	0	0	3	2
Totals		12	9	3	0	1	1	21	10

Table 16: Thoroughbred Race Fatality, Number of Starters and Distance in 2016

Race Distance	REM		FMT		WRD		Total	
	#Fatalities/ #Starters	Fatalities per 1000	#Fatalities/ #Starters	Fatalities per 1000	#Fatalities/ #Starters	Fatalities per 1000	#Fatalities/ # Starters	Fatalities per 1000
Races on DIRT								
3 fur	0/11	-	-	-	-	-	-	-
4 fur	0	-	0/341	-	-	-	-	-
4-1/2 fur	0/8	-	-	-	-	-	-	-
5 fur	0/143	-	-	-	0/95	-	-	-
5-1/2 fur	5/971	5.14	0/46	-	0/610	-	5/1627	3.07
6 fur	0/1132	-	1/225	4.44	1/586	1.71	2/1943	1.03
6-1/2 fur	0/285	-	2/238	4.20	-	-	2/523	3.82
7 fur	1/219	4.56	-	-	-	-	1/219	4.56
1 mile	3/801	3.74	0/191	-	0/595	-	3/1587	1.89
1mi70yds	2/470	4.26	-	-	0/234	-	2/704	2.84
1-1/16 mi	0/73	-	-	-	-	-	-	-
1-1/8 mi	0/19	-	-	-	-	-	-	-
Total dirt	11/4132	2.66	3/1041	2.88	1/2120	0.47	15/7293	2.06
Races on TURF								
5 fur	0/280	-	-	-	-	-	0/280	-
7-1/2 fur	0/180	-	-	-	-	-	0/180	-
1 mile	1/407	2.46	-	-	-	-	1/407	2.46
1-1/16 mi	0/153	-	-	-	-	-	0/153	-
1-1/8 mi	0/8	-	-	-	-	-	0/8	-
1-1/2 mi	0/7	-	-	-	-	-	0/7	-
Total turf	1/1035	0.96	-	-	-	-	1/1035	0.96

Table 17: Thoroughbred Race Fatality per 1000 starters (EID Format) - 2016

Surface	REM		FMT		WRD		Oklahoma Total	
	#Fatal/#Starter	Fatal per1000	#Fatal/#Starter	Fatal per1000	#Fatal/#Starter	Fatal per1000	#Fatal/#Starter	Fatal per1000
Turf	1/1035	0.96					1/1035	0.96
Dirt	11/4132	2.66	3/1041	2.88	1/2120	0.47	15/7293	2.06
Distance (all surfaces)								
<6f	5/1413	3.54	0/387	-	0/705	-	5/2505	2.00
6-7-1/2f	1/1816	0.55	3/463	6.48	1/586	1.71	5/2865	1.74
8f & up	6/1938	3.10	0/191	-	0/829	-	6/2958	2.03

Table 18: Spring Breed Race Fatality, Number of Starters and Distance in 2016

Race Distance in yards	REM			FMT			WRD			Total	
	Sprint Breed		Fatalities per 1000 Starters	Sprint Breed		Fatalities per 1000 Starters	Sprint Breed		Fatalities per 1000 Starters	#Fatalites/#Sprit Starters	Fatalities per 1000
	#Fatal	#Start		#Fatal	#Start		#Fatal	#Start			
100	0	0	-	0	10	-	0	0	-	0/10	-
110	0	8	-	0	0	-	0	10	-	0/18	-
220	0	18	-	0	0	-	0	0	-	0/18	-
250	1	710	1.41	0	521	-	0	689	-	1/1920	0.52
300	4	1080	3.70	0	600	-	0	757	-	4/2437	1.64
330	1	1059	0.94	0	227	-	0	104	-	1/1390	0.72
350	2	1167	1.71	0	507	-	0	660	-	2/2334	0.86
400	0	498	-	0	0	-	0	181	-	0/679	-
440	0	220	-	0	0	-	0	73	-	0/293	-
550	0	125	-	0	0	-	0	65	-	0/190	-
870	0	197	-	0	184	-	1	179	5.89	1/560	1.78
Total	8	5082	1.57	0	2049	-	1	2718	0.37	9/9849	0.91

Table 19: Chronic/Pre-existing Lesions Identified in Necropsy Submissions in 2016

Breed	Age	Sex	Fatal Injury	Lesion
TB	5 yr	Female	RF Fetlock	Marked LF MCIII condyle & LF carpal chips
QH	2 yr	Male	LF Scapula	Marked lesion on affected spine of scapula (fracture site)
QH	2 yr	Male	RF Carpus	Marked LF fetlock, including non-union chips
QH	3 yr	Female	LF Carpus	Marked RF carpus
QH	4 yr	Gelding	LF Carpus	Marked RF and LF carpus (fracture site); moderate bilateral front fetlocks
QH	2 yr	Gelding	LF MCIII	Marked LF MCIII (fracture site)
TB	8 yr	Gelding	RF Fetlock	Marked LF and RF fetlocks (fracture site), chips and synovitis
TB	3 yr	Male	RF Carpus	Marked LF fetlock (bone & soft tissue), moderate RF fetlock
TB	2 yr	Female	LF MCIII	Marked LF MCIII (fracture site)
TB	3 yr	Male	RF Carpus	Marked LF and RF fetlocks (MCIII, P1, synovium), moderate bilateral carpus
QH	5 yr	Gelding	LF Fetlock	Marked LF (fracture site) and RF fetlocks (MCIII, synovium)
TB	3 yr	Gelding	RF Carpus	Marked RF fetlock (MCIII condyle)
TB	3 yr	Gelding	RF Fetlock	Marked RF (fracture site) and LF fetlock, non-union chip in LF

Table 20: Number of Musculoskeletal Fatalities per Number of Race Days by Year

	Catastrophic Musculoskeletal Fatality	Number of RACE DAYS	Catastrophic Musculoskeletal Fatality per Race Day
Totals			
2007	46	265	0.174
2008	39	265	0.147
2009	40	238	0.168
2010	51	211	0.242
2011	44	211	0.208
2012	45	211	0.213
2013	45	211	0.213
2014	40	209	0.191
2015	31	209	0.148
2016	25	209	0.120

Table 21: Number of Starters by Breed and Track 2016

Breed	REM	FMT	WRD	Totals
TB	5167	1041	2120	8328
Sprint Breeds	5082	2049	2718	9849
Totals	10,249	3090	4838	18,177

Table 22: CMI by Breed and Track in 2016

	REM	FMT	WRD	Totals
Number Musculoskeletal Fatality during RACE				
TB	12	3	1	16
Sprint Breeds	8	0	1	9
Totals	20	3	2	25
Total number of STARTERS				
TB	5167	1041	2120	8328
Sprint Breeds	5082	2049	2718	9849
Totals	10,249	3090	4838	18,177
CMI index – number per 1000 starters				
TB	2.32	2.88	0.47	1.92
Sprint Breeds	1.57	-	0.37	0.91
Totals	1.95	0.97	0.41	1.38

Reference:

1. Equine Fatality Summary; Equine Injury Database; Initiative of the Jockey Club:
<http://www.jockeyclub.com>