

VETERINARY MEDICAL DIAGNOSTIC PROGRAM

JANUARY 2012 TO DECEMBER 2012



Supported by the
Oklahoma Horse Racing Commission



Conducted by the
Oklahoma Animal Disease Diagnostic Laboratory
Center for Veterinary Health Sciences
Stillwater, OK
May 1, 2013



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, 2012 through December 31, 2012**

Introduction

This report summarizes the case submissions and diagnostic findings of the Veterinary Medical Diagnostic Program for the period starting January 1, 2012 and ending December 31, 2012.

The Veterinary Medical Diagnostic Program, initiated in 1997, serves to: 1) investigate and document the types of injuries sustained by horses involved in horse racing and in race training related activities on racetracks that fall under OHRC jurisdiction; 2) monitor this population of migrating horses for the presence of any epizootic disease(s) that may pose a threat to Oklahoma's horse industry; and 3) evaluate the overall effects of all other aspects (including diet and stress) of racing and race training on the health and well being of Oklahoma's racehorses. This program is the result of an alliance formed between the Oklahoma Horse Racing Commission (OHRC) and the Oklahoma Animal Disease Diagnostic Laboratory (OADDL).

All horses that die or must be humanely euthanized on any of the three Oklahoma racetracks that fall under the OHRC jurisdiction are submitted to OADDL for a comprehensive necropsy examination. Results of necropsy examination are reported to the OHRC office in Oklahoma City with a copy sent to the Official OHRC Veterinarian at the submitting racetrack. The necropsy examination includes: 1) a complete necropsy and gross examination of the carcass including microscopic examination of tissues (histopathology) if warranted; 2) a thorough examination of all injuries, including an analysis of pre-existing conditions that may have led to the occurrence of the injury; 3) microbiology testing in cases where infectious diseases are suspect; and 4) toxicology testing as dictated by the OHRC. This last item was changed by direction of the funding agency in May 2011 and toxicology analysis is at the discretion of OHRC.

For the calendar year 2012, a total of seventy (78) horses were submitted to OADDL under the Veterinary Medical Diagnostic Program. Ten (10) animals died and sixty-eight (68) animals were euthanized, see Table 1. A summary of OADDL's necropsy findings follow. For the remainder of this report individual tracks are identified by initials: Remington Park (REM), Fair Meadows Tulsa (FMT) and Will Rogers Downs (WRD). Specific OADDL necropsy reports are referenced in parentheses (12XXXXXX). These reports have all been previously submitted to the commission.

Table 1: Total Equine Mortality – 2012

	REM	FMT	WRD	TOTAL
DIED	5	0	5	10
EUTHANIZED	37	10	21	68
TOTAL	42	10	26	78

Total equine mortality was increased in 2012, with a number of submissions equal to the all time high reported in 2010. Submissions were increased from Remington Park (33), increased slightly from Will Rogers Downs (1 case) and decreased slightly from Fair Meadows Tulsa (2 cases), compared to 2011.

Submissions:

A total of seventy (78) horses from Oklahoma racetracks were submitted to OADDL for examination during the 2012 calendar year. Table 2 (below) indicates the total submissions for the joint OADDL:OHRC necropsy program for the years 2003-2012.

Table 2: Total Necropsy Submissions, OADDL:OHRC Necropsy 2003-2012

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Submissions	35	41	53	73	70	61	60	78	70	78

Monthly Distribution of Submission:

Table 3 represents the distribution of submissions from each racetrack, sorted by month. The monthly fluctuation of cases most likely coincides with the number of racing days and training activity. During October 2012 there were 19 (*) horses submitted. This is an all-time high (ten years) for submissions in one month of this program (previous high was 17 in April of 2010). One quarter 24% (19/78) of 2012 submissions occurred in October.

Table 3: Monthly Distribution of Necropsy Submissions for 2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
REM	0	2	0	8	7	0	1	1	5	10	6	2	42
FMT	0	0	0	0	0	2	8	0	0	0	0	0	10
WRD	0	1	6	4	1	4	0	0	1	9	0	0	26
Total	0	3	6	12	8	6	9	1	6	19*	6	2	78

Table 4 (following page) shows the monthly submissions by horse breed. During this reporting period, Thoroughbred submissions were again higher than Quarter Horse, Appaloosa and American Paints. Thoroughbred submissions peaked in October and March with Quarter Horse peaks in May, July and October. Two-thirds of Paint and Appaloosa deaths were submitted in October also, with one Paint in April.

Table 4: Monthly Distribution of Necropsy Submissions by Breed for 2012

Breed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Thoroughbred	0	1	6	5	1	3	3	1	5	10	6	2	43
Quarter Horse	0	2	0	6	7	3	6	0	1	7	0	0	32
Paint	0	0	0	1	0	0	0	0	0	1	0	0	2
Appaloosa	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	3	6	12	8	6	9	1	6	19	6	2	78

Gender and Breed of Horse:**Table 5: Submission by Breed 2012**

BREED	Number of Horses
Thoroughbred	43
Quarter Horse	32
American Paint	2
Appaloosa	1
Total	78

The Breed distribution of necropsy case submissions to OADDL for 2012 is presented in Table 5 to the left. Thoroughbred submissions were most frequent 55% (43/78). Gender submissions are presented below in Table 6 and geldings (neutered males) again predominate at 59% (46/78). Surprisingly, Thoroughbred female submissions were again greatest in 2012,

accounting for 20% (16/78) of the cases (23% in 2011).

Table 6: Gender and Breed of Submissions 2012

		REM	FMT	WRD	TOTAL
Male	Thoroughbred	2	1	0	3
	Quarter Horse	2	0	2	4
Female	Thoroughbred	13	0	3	16
	Quarter Horse	3	3	2	8
	Paint	0	0	1	1
Gelding	Thoroughbred	11	1	13	25
	Quarter Horse	10	5	4	19
	Paint	1	0	0	1
	Appaloosa	0	0	1	1
Total		42	10	26	78

Age of Horse:

The distribution of racehorse submissions arranged by age, breed and track during 2012 is shown in Table 7 (next page). This data is also segregated by breed per request of breed registries. Our Oklahoma data continue to indicate larger numbers of 2-3 year old animals in total mortality in 2012. Quarter Horses accounted for the largest number of 2 and 3 year old submissions in 2012. There were 8 "sprint" type horses (Quarter Horse, Paint, Appaloosa) older than three years submitted in 2012 and 28% (22/78) of animals over three years of age were Thoroughbreds. There may be more animals in the two- and three-year old age group in active training and racing in Oklahoma, and thus are the

greater at risk population. Two Thoroughbred nine-year old animals were submitted in 2012.

Table 7: Age of Horse and Breed 2012.

		REM	FMT	WRD	Total
Two year old					20
	Thoroughbred	5	0	3	8
	Quarter Horse	4	3	3	10
	Paint	1	0	0	1
	Appaloosa	0	0	1	1
Three year old					28
	Thoroughbred	11	0	2	13
	Quarter Horse	7	4	4	15
Four year old					15
	Thoroughbred	5	0	7	12
	Quarter Horse	1	0	2	3
Five year old					7
	Thoroughbred	2	0	1	3
	Quarter Horse	3	0	0	3
	Paint	0	0	1	1
Six year old					3
	Thoroughbred	0	1	1	2
	Quarter Horse	0	1	0	1
Seven year old					3
	Thoroughbred	1	1	1	3
Nine year old					2
	Thoroughbred	2	0	0	2
Total		42	10	26	78

Age of Horse (years) by Breed:

Table 8 below simplifies the 2012 necropsy submissions by age and breed. This information was requested by the Commission during our presentation of the 2006 report.

Table 8: Age of Horse and Breed 2012.

Breed	2	3	4	5	6	7	9	Total
Thoroughbred	8	13	12	3	2	3	2	43
Quarter Horse	10	15	3	3	1	0	0	32
American Paint	1	0	0	1	0	0	0	2
Appaloosa	1	0	0	0	0	0	0	1
Total	20	28	15	7	3	3	2	78

This table displays that the majority of two-year-old fatalities occur in Quarter Horses, 50% (10/20). Eight of 20 (40%) of Thoroughbred fatalities were in two year olds however and two of the three American Paint and Appaloosa fatalities were in two year

olds. Quarter Horses accounted for the majority of three year old submissions (54%) and Thoroughbreds the majority of four year old submissions (80%).

Fatal Event by Age (in years):

Table 9: Fatal Event by Age (years) 2012

Age	Racing	Training	Non-exercise	Total
2	10	7	3	20
3	20	5	3	28
4	9	2	4	15
5	5	2	0	7
6	3	0	0	3
7	1	0	2	3
9	1	1	0	2
Total	49	17	12	78

This section describes the fatal event (determined by OHRC history and OADDL necropsy) as compared to age of the horse. The categories included are animals injured during racing, routine training, accidents and those dying of non-exercise or “natural” disease conditions (combined). This category is continued for 2012 in Table 9 to the left. Oklahoma continues to report more race day fatalities than training

fatalities compared to some other jurisdictions. This reflects the large number of animals that train off-site of OHRC facilities. In 2012 there was an increase in training fatalities submitted however, up to 17 from 6 reported in 2011. Non-exercise/accident submissions were 12 and similar to the 13 reported in 2011.

Fatal Event by Breed:

This year we again report the fatal event categories by breed in Table 10 below. All breeds reported highest fatalities for racing, but this may represent a bias in the current necropsy program. Race day mortality remains the primary submission to the OADDL:OHRC necropsy program, 49/78 (63%) submissions. The majority 72% (23/32) of the Quarter Horse and 56% (24/43) Thoroughbred fatalities occurred on race day. There were more training day deaths submitted in 2012 than 2011 as noted above, and one American Paint mortality was non-exercise related.

Table 10: Fatal Event by Breed 2012:

Breed	Racing	Training	Non-exercise	Total
Thoroughbred	24	12	7	43
Quarter Horse	23	5	4	32
American Paint	1	0	1	2
Appaloosa	1	0	0	1
Total	49	17	12	78

Complete tabulation of category of death and breed is presented in Table 11 on the next page:

Table 11: Fatal event by breed and track 2012.

		REM	FMT	WRD	Total
RACE DAY					49
	Thoroughbred	17	2	5	24
	Quarter Horse	11	6	6	23
	Am. Paint	0	0	1	1
	Appaloosa	0	0	1	1
	Before Race				2
	Thoroughbred	0	0	1	1
	Quarter Horse	0	1	0	1
(at finish or)	During Race				39
	Thoroughbred	14	2	4	20
	Quarter Horse	9	5	3	17
	Am. Paint	0	0	1	1
	Appaloosa	0	0	1	1
	Finished Race				8
	Thoroughbred	3	0	0	3
	Quarter Horse	2	0	3	5
TRAINING					17
	Thoroughbred	6	0	6	12
	Quarter Horse	3	1	1	5
Non-Exercise					12
	Thoroughbred	3	0	4	7
	Quarter Horse	1	1	2	4
	Am. Paint	1	0	0	1
TOTAL		42	10	26	78

The majority of race day deaths, 96% (47/49), occurred during or immediately following a race in 2012. One RP animal did die in the holding barn approximately one hour following a race. Two race day fatalities occurred prior to the race; one injury in the paddock at WRD and one injury in the gate at FMT were submitted. Thoroughbred animals accounted for the majority of training fatalities 70% (12/17) and the majority of non-exercise associated submissions were from WRD 50% (6/12) or were Thoroughbred 58% (7/12).

GOAL 1: INVESTIGATE AND DOCUMENT TYPES OF INJURIES:

Distribution of Fatal Activity and Track:

Table 12: Fatal Activity by Track - 2012

TRACK	Racing	Training	Non-exercise	Total
REM	28	9	5	42
FMT	8	1	1	10
WRD	13	7	6	26
Total	49	17	12	78

Table 12 on the previous page reports a summary of activity for case fatalities for each of the three submitting tracks. Training submissions were increased from both REM and WRD in 2012 compared to 2011. In addition, non-exercise fatalities at WRD exceeded REM despite the later have more race days and stalls available. Table 13, below, further separates the total fatalities in a different manner based on final necropsy analysis. Cause of death is divided into categories of natural disease states (non-exercise related and accidents), cases of exercise induced pulmonary hemorrhage (EIPH) and finally conditions involving musculoskeletal injury.

Table 13: Cause of Death by Track - 2012

	REM	FMT	WRD	Total
Natural Disease/Non-Exercise/Accident	5	1	6	12
EIPH (bleeder on RACE DAY)	1	0	1	2
Musculoskeletal Injury	36	9	19	64
Racing:	27	7	11	45
Training:	9	1	7	17
Pre-race:	0	1	1	2
Total	42	10	26	78

The majority of “injuries” sustained by athletic horses affect the musculoskeletal system. In 2012, 82% (64/78) of the submissions were related to musculoskeletal system injury. This method of separating racetrack injuries has been used in most other jurisdictions world-wide. By this means of segregation, it is possible to assess the Catastrophic Musculoskeletal Injury Index (CMI) utilized to evaluate over-all incidence of exercise associated injury. The number of 45 catastrophic musculoskeletal injuries will be utilized further in this report.

Exercise Induced Pulmonary Hemorrhage:

Exercise induced pulmonary hemorrhage (EIPH), or “bleeders” in the horse remains an enigma affecting racehorses and other equine athletes. This condition has been reported since early history in the horse and research efforts remain directed at the underlying pathophysiology, treatment and management of this condition. The condition is typically not reported as an “injury” in most jurisdictions since the majority of these cases are not fatal. Identification systems for “bleeders” are in place in Oklahoma. During 2012 there were two submissions where EIPH was confirmed as the cause of death on race day animals; both were Quarter Horses, one from WRD and one from REM. The EIPH animals are included in Table 13 above.

Musculoskeletal Injury:

As seen in Table 13, the majority (82%) of the total fatalities were related to musculoskeletal disorders, essentially unchanged from 2003. It has been previously reported that the majority of musculoskeletal injuries sustained by horses racing in the United States involve the limbs, particularly distal forelimbs. Continued monitoring of limb injuries is important for Commission Veterinarians, Track Veterinarians, Track Management and Groundskeepers to improve and ensure a safe racing environment. Table 14 (below) displays the distribution of limb injuries sustained by animals during racing or race training, pre-race injuries and EIPH horses but excludes accidents which involved the limbs. This data is also segregated by breed, track and limb in 2012. In 2012 there were nearly equal numbers of fatalities with injury to right and left front limbs. This is a distinct change from 2011 when two-thirds were the right front limb. The significance of this change is uncertain and should be evaluated based on track conditions/surface, entries and management changes during 2012. There were 11% (7/66) injuries to sites other than distal forelimbs and one case each from left and right hind limb. There were no bilateral forelimb injuries submitted in 2012.

Table 14: Limb injury by breed and racing/training 2012.

	REM		FMT		WRD		TOTAL		Sum
	Race	Train	Race	Train	Race	Train	Race	Train	
Right Front									28
TB	4	5	1	0	2	2	7	7	14
QH	4	3	2	0	4	0	10	3	13
Pnt	0	0	0	0	1	0	1	0	1
Left Front									29
TB	10	1	1	0	2	3	13	4	17
QH	5	0	4	1	0	1	9	2	11
App	0	0	0	0	1	0	1	0	1
Right Hind									1
TB	0	0	0	0	0	1	0	1	1
QH	0	0	0	0	0	0	0	0	0
Left Hind									1
TB	0	0	0	0	0	0	0	0	0
QH	0	0	0	0	1	0	1	0	1
Other									7
TB	3	0	0	0	1	0	4	0	4
QH	2	0	0	0	1	0	3	0	3
TOTAL	28	9	8	1	13	7	49	17	66

Musculoskeletal Disorder – All Racing or Race Training Injuries:

The complete reporting of injury site is included below in Table 15. Breed is distributed by Thoroughbred (TB) and Sprint breeds (Quarter Horse, American Paint, Appaloosa) designated “Spnt.” Surveys and research in other racing jurisdictions have reported increased injury to the front limbs and identified injuries to the distal limbs (distal to the carpus) as the most common injury in the racing equine athlete. This table includes race and training injuries, pre-race injury and EIPH but excludes accidents/non-exercise cases. Multiple injury sites were noted at necropsy in some carpal and fetlock cases; where the primary bone fracture was not identified.

Table 15: All Fatal Injuries during Racing or Race Training & Track 2012

Injury	REM		FMT		WRD		Total		Sum
	TB	Spnt	TB	Spnt	TB	Spnt	TB	Spnt	
Pastern (P1/P2):	0	0	0	1	0	0	0	1	1
Fetlock Failure:	10	3	2	4	6	1	18	8	26
Carpal Fracture:	7	4	0	1	0	5	7	10	17
Humerus:	2	1	0	1	2	0	4	2	6
Scapula:	1	2	0	0	0	1	1	3	4
Cannon (MCIII/MTIII):	0	1	0	0	1	0	1	1	2
Artery rupture (Abd/Thor):	2	0	0	0	0	0	2	0	2
Pelvis (ilium):	0	1	0	0	0	1	0	2	2
Radius/Ulna:	0	1	0	0	1	0	1	1	2
Vertebrae (C,T, L):	1	0	0	0	0	0	1	0	1
Skull:	0	0	0	0	1	0	1	0	1
E.I.P.H.	0	1	0	0	0	1	0	2	2
Total	23	14	2	7	11	9	36	30	66

In 2012 there were 67% (44/66) fatal musculoskeletal injuries documented affecting the region from the carpus/tarsus distal. This is a mild departure from previous years where over 70% limb injuries were distal limbs. The greatest majority of injuries however continued to involve the fetlock joint 26/66 (39%), and carpal fractures were 26% (17/66) reduced from 50% in 2011. Surprisingly there were increased numbers of fractures to proximal forelimbs in 2012. There were six fractures of humerus (9%) and four scapular fractures (6%). These proximal forelimb injuries were nearly all training injuries (90% or 9/10) and equally distributed between both Thoroughbred and Sprint breeds. Two ruptured artery cases were submitted (both Thoroughbreds), two pelvic/ilium fractures (both Sprint breeds) and two radial fractures (one of each breed). The skull fracture and pastern fracture were pre-race injuries in paddock and starting gate respectively. The vertebral fracture involved cervical spine in a Thoroughbred at REM during a race. The EIPH cases were reported in Table 15 above.

GOAL 2: MONITOR FOR EPIZOOTIC DISEASE:

In Table 10 from page 5, there were 12/78 (15%) of submitted fatal cases reported due to non-exercise related activities, natural diseases and accidents. These animals include cases of infectious or communicable disease of importance to all animals competing, training or residing in the racetrack environment. Table 16 (below) documents these cases based on final necropsy analysis at OADDL.

Table 16: Non-Exercise, Natural Disease, Accident by Track-2012

Disease Condition:	REM	FMT	WRD	
GI: History of colic; segmental colitis.	1	0	0	died
GI: No history but treated; large colon torsion.	0	0	1	died
GI: Treated for 12 hours; small intestine torsion.	0	0	1	euth.
GI: Treated for 72 hours; anterior enteritis.	1	0	0	euth.
GI: Vague signs, dehydration; typhlocolitis (+pneu)	0	0	1	euth.
Respiratory: Pulmonary edema/hemorrhage.	1	0	0	died
Respiratory: Pleuropneumonia.	1	0	0	euth.
Accident: Flipped in wash rack; brain edema/hem.	0	0	1	died
Accident: Found in stall, fracture LH MTIII.	0	0	1	euth.
Septic joint: Treated in barn 2-3 weeks.	1	0	0	euth.
CNS Toxin: Arrived ill; negative encephalitis.	0	1	0	euth.
Unknown: Big spleen; acute brainstem hemorrhage.	0	0	1	died
Total	5	1	6	12

In 2012 the majority of non-exercise associated submissions were again associated with gastrointestinal disorders 42% (5/12). Most of these horses were reported in the history to have exhibited colic symptoms and some received veterinary treatment prior to death or euthanasia. One animal with typhlocolitis identified at necropsy was reportedly sick for 3 days with variable clinical signs and was found to also have an acute pleuropneumonia at the time of death. Respiratory diseases are also common and in 2012 two animals had necropsy findings consistent with primary respiratory condition. Both occurred at Remington Park and one was a classic case of pleuropneumonia (generally bacterial lung infection). The second case revealed residual pulmonary hemorrhage with edema that was felt to represent reaction possibly to previous more severe hemorrhagic event. One Thoroughbred at Remington Park was euthanized for a septic right front fetlock joint that was unsuccessfully treated in the barn for several weeks. One Thoroughbred submitted from Will Rogers Downs was found dead with no supplemental history and necropsy identified an enlarged spleen (toxicology recommended) along with acute brainstem edema/hemorrhage with suspected trauma. Two accidental deaths were submitted in 2012, both from Will Rogers Downs. One animal flipped at the wash rack traumatizing the brain and died and the second was an animal found in its stall with fracture of the left hind cannon bone. One animal arrived ill at FMT with signs including

central nervous system signs. Screening for infectious diseases was negative and complete necropsy evaluation did not reveal evidence of encephalitis, myelitis or meningitis however did confirm secondary acute pneumonia. Previous toxic exposure was suspected in that case.

Bacteriology was performed in 6 cases and over nine pathogenic bacteria were isolated from respiratory and GI cases. No *Salmonella sp.* or *Streptococcus equi* (Strangles) bacteria were isolated in 2012. Screening for Equine Herpes Virus by PCR testing was performed on 5 cases, for West Nile Virus on 3 cases and Rabies Virus in 2 cases. All viral screening was negative and portions of this testing were subsidized by the Oklahoma Department of Agriculture, Food and Forestry (ODAFF). Histopathology (microscopic examination of tissue) was performed on some necropsy cases in order to further characterize lesions noted on gross examination.

The disease surveillance emphasis for the cooperative OADDL:OHRC program is vital to the Oklahoma racing industry. Surveillance for Piroplasmosis continued in 2012 for animals traveling to other racing jurisdictions. The requirement for testing at Oklahoma tracks however was suspended in January 2012. Recent national outbreaks of Equine Viral Arteritis (EVA) in 2006, Equine Herpes-1 (EHV-1, neurologic form) in 2006/2007/2011/2012 and Contagious Equine Metritis (CEM) in the winter of 2013 have emphasized the importance of disease surveillance for general health of the equine population. There is bias in the current program, however, in that only necropsy examinations are being performed. As part of OADDL's continued commitment, we plan to monitor a percentage of routine submissions from each track for respiratory viruses, bacteria and salmonella during the 2013 calendar year.

Drug Testing (TOXICOLOGY):

Since the initiation of the cooperative OADDL:OHRC Diagnostic Program, some toxicology analysis has been added, at the request of the OHRC. When possible, urine and synovial fluid are harvested from fatally injured equines that died during or immediately following an OHRC race. Following the 2010 report renewal meeting (May 2011) the OHRC requested reduction in this toxicology portion of the program. This change was necessitated due to reduced income (down-turn in economy) and increased submission numbers. The performance of "routine" toxicology on submissions for OHRC was suspended May 1, 2011. No toxicology analysis of specimens was requested at OADDL by the OHRC for calendar year 2012.

GOAL 3: OVERALL RACEHORSE HEALTH:

The overall health and well being of the Oklahoma racehorse population remains a stated goal of the joint OADDL:OHRC Program. Of particular interest is the hoof anatomy/morphology/angle and shoeing characteristics of the equine population. This examination is attempted on all submissions, including non-exercise related deaths and pony horse/outrider animals. Table 17 (below) displays the hoof/shoeing data compiled during the 2012 time period. The abnormalities are quantitated for 2012 and also reported by breed (rather than track) at the request of breed associations.

Hoof Anatomy/Shoe Characteristics:

Table 17: Hoof Anatomy and Horse Shoe Characteristics - 2012

		Thoroughbred	QH/Pnt/App	TOTAL
Toe Grabs:				
	Front < 5mm	34	27	61
	Front > 5mm	5	3	8
	Hind < 5mm	24	16	40
	Hind > 5mm	11	10	21
Shoes Not Examined:		3	5	8
Hind Shoes Not Examined:		7	9	16
Flat shoe/Barefooted:		1	0	1
Toe/Heel Length	Normal	9	7	16
Long toe/low heel	Mild	16	11	27
	Moderate	11	13	24
	Marked	7	4	11
	Not reported	0	0	0
Under-run heels	Normal	5	1	6
	Mild	23	14	37
	Moderate	9	17	26
	Marked	6	3	9
	Not reported	0	0	0
Abnormal Hoof		3	3	6
Pads		2	3	5
Wide web/BarShoe		2	1	3

A concerted effort was made to record the hoof morphology and shoeing characteristics on all horses submitted under the OADDL:OHRC Program in 2012. There was an interest in this topic generated during the Commission meeting in 2007 (for year-end report 2006). Long toe grabs were present on front feet of 8 animals in 2012, 5 were Thoroughbred and 3 Sprint breeds. Long toe grabs continued to be identified on hind feet

of both types approximately one-half of the time (21/40). Shoes were not examined on 8 animals, hind shoes not examined on 16 animals and one animal submitted did not have shoes. Over-all there were 55% (43/78) set of hooves evaluated as “normal” or “mild” with respect to toe length, heel length and symmetry. There continues to be improvement in the hoof and shoeing characteristics monitored in this necropsy program. There was a marked reduction in the number of hooves with abnormal growth, quarter cracks, imbalance, mis-shapen or epoxy repairs in 2012. Only 8% (6/78) were noted, down from 30% in 2011. Three animals were examined with corrective shoes including wide-webs (TB), aluminum wedge egg-bars (TB) and squared-rolled toe shoe (QH). Five horses from both breed types were examined with rim pads, which may serve a protective function in some cases.

Gastric Ulcers:

Table 18: Gastric Ulcers - 2012

	Thoroughbred	QH/Pt/Ap	TOTAL
None	11	14	25
Mild	16	10	26
Moderate	5	3	8
Marked	4	0	4
Not Reported	7	8	15
Total	43	35	78

Gastric ulceration has been increasingly identified over the last twenty years as a serious disease condition affecting equine athletes. Indeed, stalled animals involved in a variety of training situations can be affected by significant gastric ulceration. We are fortunate at the Center for Veterinary Health Sciences, Oklahoma State University to have researchers involved in the identification, treatment and pathogenesis of equine gastric ulcers. Monitoring of gastric ulcers continues to be a component of the OHRC:OADDL Diagnostic Program. Table 18 presents the data compiled during 2012 regarding gastric ulceration in the Oklahoma racehorse diagnostic program. This data is presented by breed at the request of registry participants, with Thoroughbred compared to combined “Sprint” horses (Quarter Horse, American Paint/Appaloosa).

Comments regarding gastric ulcers were not reported in fifteen cases in 2012. This may reflect either none present or cases unable to be evaluated due to autolysis. Of the 63 animals with gastric lesions reported, 41% (26/63) had only mild ulcers and 25/63 (40%) total animals examined had no ulcers identified. Slightly fewer Sprint breed horses had no or mild ulcers than Thoroughbreds (24 vs 27). All of the severe gastric ulceration cases and more than half of the moderate gastric ulceration cases examined were in Thoroughbred animals. The total numbers were very similar to those reported in 2011. Trainers, owners and veterinarians should continue to recognize the importance of gastric ulcers in overall horse health.

Fatal Injury and Track Location:

Table 19: Race Fatality by Track Location 2012

	REM	FMT	WRD	Total
Holding Barn (post-race)	1	0	0	1
Paddock (pre-race)	0	0	1	1
At/In Starting Gate	0	1	0	1
Out of Starting Gate	2	0	0	2
Far Turn	5	1	1	7
Home Stretch	3	2	2	7
Backside	1	1	0	2
1/8 Pole	2	0	0	2
1/4 Pole	6	0	0	6
1/2 Pole	0	0	2	2
Clubhouse Turn	1	0	1	2
Finish Line/At Finish	1	2	1	4
Before Wire	3	1	0	4
Finished Race	4	0	5	9
At Gap	1	0	0	1
Not Reported	7	1	7	15
Total	37	9	20	66

The reporting of location on a racetrack where a catastrophic injury occurs to a racehorse has been utilized by several racing jurisdictions to improve overall safety for equine competitors. This data is compiled as part of the cooperative OADDL:OHRC diagnostic program but is also reliant upon submission of this data from Commission/Track personnel. The 2012 data for track location is included in this report as Table 19 above and includes, training deaths, bleeders and pre-race fatalities. This data was not provided on the submission form in 15/66 (23%) of the cases. The majority of non-reported locations were in training accidents (14) where the responding veterinarian may not have been informed about location. For race day fatalities the majority of cases continue to be described as occurring at, around or just past the finish line, 33% (17/51). In 2012, there were four fatalities between 70 and 100 yards of the finish line, which was increased from 2011. There were two fatalities immediately out of the gate similar to 2011 (3), however both occurred at Remington Park. Significant submissions were reported from the far turn and quarter-pole at Remington Park in 2012. More in-depth analysis and standard reporting of track location should continue to be an objective of this program for submitting OHRC personnel.

Race Fatality and Class of Race:

Table 20: Race Fatality by Class of Race & Breed – 2012

	REM		FMT		WRD		Total		TOTAL
	TB	Q/P/A	TB	Q/P/A	TB	Q/P/A	TB	Q/P/A	
Maiden claiming	3	2	0	3	1	0	4	5	9
Claiming:	8	3	2	2	2	3	12	8	20
\$0-4999	0	0	0	0	0	0	0	0	0
\$5000-7499	1	0	1	3	0	2	2	5	7
\$7500-9999	5	1	0	0	3	0	8	1	9
\$10,000-19,999	5*	1	1	2	0	1	6	4	10
\$20,000-up	0*	3	0	0	0	0	0	3	3
Futurity/Derby Trial	0	2	0	0	0	1	0	3	3
Allowance	3*	1	0	0	1	1	4	2	6
Stakes	0	0	0	0	0	1	0	1	1
Maiden Race	3	3	0	0	0	2	3	5	8
Total	17	11	2	5	4	8	23	24	47

In the 2006 year-end report to OHRC, OADDL included data regarding class of race, this data was continued in 2012. The 47 race fatality cases (including EIPH cases but not the pre-race deaths (horses were scratched)) are displayed with respect to class of race in Table 20. Requests from OHRC in 2009 to stratify the claiming price are included in this table. In addition, this table also indicates class of race by breed, as requested in 2010. Thoroughbreds (TB) are in one column and Quarter Horse, Paint, Appaloosa (Q/P/A) in another. There were three Thoroughbred fatalities at Remington Park that were Allowance-Claiming races, indicated as * and tabulated in the Allowance row in the Table. One was optional claiming for \$15,000 and one for \$25,000. During 2012 the great majority of fatalities are again in claiming races 62% (29/47). The claiming value tabulation includes both Claiming and Maiden Claiming races. A majority of claiming race fatalities were for values greater than \$7,500 and no horses were submitted for claiming values less than \$5,000. Claiming fatalities were very slightly higher for Thoroughbreds 55% (16/29) than for combined sprint horses (Q/P/A). Slightly more sprint breed (Q/P/A) fatalities were noted in Stakes, Allowance or Maiden races 53% (8/15) than Thoroughbreds. All of the Futurity Trial cases were in Sprint breeds. Fewer Futurity Trial, Futurity and <\$5000 Claimers were submitted than in 2011.

The great majority of **all** race day deaths, 92% (46/49), did have purse money included from the **Accredited Oklahoma Bred** program again in 2012.

Chronic Musculoskeletal Lesions:

Complete identification of pre-existing or chronic changes in the musculoskeletal system continues to be documented in the OADDL:OHRC diagnostic program. This analysis was completed on most animals submitted, regardless of history in 2012. There were 23 fatal race day or training cases submitted in which significant pre-existing or chronic joint/bone lesions were present. The distribution of these submissions is summarized below in Table 21. There were four of these cases submitted in March (all WRD TB), four in July (all FMT, 2 QH and 2 TB) and four in October (3 REM TB's and 1 WRD QH). No Appaloosa or Paint animals were identified with significant pre-existing or chronic lesions. There were more than double the number of Thoroughbred horses examined with significant pre-existing or chronic musculoskeletal abnormalities in 2012. Only three of these submissions were training injuries. Some chronic lesions identified could be considered normal remodeling of bone and joint in response to athletic training. In 2012, 15 of these cases had significant changes in the contralateral limb (opposite side) to the primary bone of injury. This information will continue to be tabulated and submitted to OHRC but a concerted effort is needed by all in racing to insure that animals are ready for strenuous work.

REM		FMT		WRD		Total	
TB	QH	TB	QH	TB	QH	TB	QH
8	3	2	2	6	1	16	6

Final reports were issued to OHRC on individual cases regarding pre-existing lesions and other conditions preceding death. Review of these cases by OHRC or submitting Track officials is part of the usefulness of the necropsy program. There are several medical and surgical equine hospital facilities within easy access of all three tracks in Oklahoma however; and it should be the goal of breed registries and horsemen's groups to ensure appropriate medical care for all animals in the racing industry.

SUMMARY:

The year end summary by track is presented in Table 23 on the next page, there were 45 musculoskeletal race fatalities in 2012 (excluding the 2 EIPH cases) – Table 13 (page 7). There was a slight increase in fatality per race day in Oklahoma during 2012. This value rose from 0.208 in 2011 to 0.213 in 2013. This increase was associated with an increase in race day fatality at Remington Park from 0.179 (2011) to 0.222 (2012). Indeed, the total number of race day musculoskeletal horses submitted from Remington Park in 2012 was 26, a ten year high. Previous peak submission from Remington Park was 23 animals in 2006 and 2009. This was also the first time this ratio of fatality per race day was higher at Remington Park than the other tracks. Both Fair Meadows Tulsa and Will Rogers Downs had slight reduction in the number of race day musculoskeletal fatalities per race day. The number of starters per field were similar for all breeds and tracks except for FMT Thoroughbreds which were 7.6, Table 22 below.

Table 22: Number of Starters per race by Breed and Track.

BREED	REM	FMT	WRD
Thoroughbred			
# starters	5865	1265	2876
# Races	612	166	316
Starters/Race	9.6	7.6	9.1
Quarter Horse			
# starters	4390	1649	2627
# Races	480	179	290
Starters/Race	9.1	9.2	9.1
Mixed(Ap/Pt)			
# starters	761	502	543
# Races	83	57	60
Starters/Race	9.2	8.8	9.0

Table 23: Number of Musculoskeletal Fatalities per Number of Race Days

		Catastrophic Musculoskeletal Fatality	Number of RACE DAYS	Catastrophic Musculoskeletal Fatality per Race Day
TOTAL	2006	44	264	0.167
	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
Remington Park	2006	23	118	0.195
	2007	14	119	0.118
	2008	16	117	0.137
	2009	23	117	0.197
	2010	22	117	0.188
	2011	21	117	0.179
	2012	26	117	0.222
Blue Ribbon Downs	2006	7	71	0.098
	2007	16	70	0.229
	2008	5	70	0.071
	2009	8	43	0.186
Fair MeadowsTulsa	2006	10	33	0.303
	2007	11	34	0.324
	2008	15	34	0.441
	2009	3	34	0.088
	2010	15	34	0.441
	2011	9	34	0.265
	2012	8	34	0.235
Will Rogers Downs	2006	4	44	0.091
	2007	5	42	0.119
	2008	3	44	0.068
	2009	6	44	0.136
	2010	14	60	0.233
	2011	14	60	0.233
	2012	11	60	0.183

Conclusions from the 2012 year-end report indicate that Oklahoma racetracks remain an active and relatively safe environment for equine athletes. During 2012, there were 45 race day musculoskeletal fatalities, 2 EIPH fatalities and 2 pre-race musculoskeletal fatalities submitted, described and reported by OADDL. This data allow calculation of a catastrophic musculoskeletal index per day of live racing for the entire OHRC program and subdivided for each track and presented in the previous chart. This is not a traditional value for comparison used by other jurisdictions but is useful in providing analysis for Oklahoma.

A more classic analysis of catastrophic musculoskeletal injury used by most racing jurisdictions is the Catastrophic Musculoskeletal Injury Index (CMI). This is a more traditional manner of comparing injury statistics and is calculated as the number of Catastrophic Musculoskeletal Injuries per 1000 horses starting to race. This data has been supplied for 2012 by the breed registries and will be used in this report. The information is presented in table form below, Table 24, segregated by breed, race track and over-all.

Table 24: CMI by Breed and Track 2012:

	REM	FMT	WRD	TOTAL
Number Musculoskeletal Fatality during RACE:				
Thoroughbred	17	2	4	23
Qtr/Pnt/App	10	5	7	22
Total:	27	7	11	45
Total number of STARTERS:				
Thoroughbred	5865	1265	2876	10,006
Qtr/Pnt/App	5151	2151	3170	10,472
Total:	11,016	3416	6046	20,478
CMI "index" – number per 1000 starters				
Thoroughbred	2.90	1.58	1.39	2.30
Qtr/Pnt/App	1.94	2.32	2.21	2.10
TOTAL	2.45	2.05	1.82	2.20

The above CMI is an attempt to correlate with what is reported in other jurisdictions. We are fortunate in Oklahoma to have cooperation between breed associations, regulatory associations, practicing veterinarians and diagnosticians in performing analysis. The number of "starters" per race will remain critical in determining any further factors regarding over-all racing safety. Nationwide statistics predict a range of this CMI index between 2.0 and 5.0 and Table 24 demonstrates Oklahoma remains in line with this figure with a "state-wide" index of 2.20. This value increased to 2.20 from 2.08 reported in 2011. The CMI index was very similar for both Thoroughbreds (2.30) and Quarter Horses (2.10) in 2012. Indeed the CMI was lower for Thoroughbreds at both FMT and WRD however the number of Thoroughbred starters and field size at those tracks was smaller than REM (Table 22 above). There was a mild increase in Sprint breed CMI at Remington Park from 2011 and an increase of one CMI index point (1.98 in 2011 to 2.90) for Thoroughbreds at that same track in 2012. Remington Park had the highest

CMI index of all tracks in 2012 (2.45) and was up from 1.86 reported in 2011. Oklahoma is unique in that we have nearly equal numbers of both Thoroughbreds and Quarter Horses/Paints/Appaloosas competing; which may reflect information that is important nationally at this time.

Limb of injury was equally distributed between left and right front in 2012. Anatomic location of injury identified fetlock injury more than twice as frequently as carpas, a difference from 2011. Disease surveillance did not identify reportable diseases in 2012. No toxicology analysis of specimens was performed in 2012; however toxicology is available at the discretion of OHRC on all cases submitted to OADDL. Monitoring of hoof anatomy, shoe characteristics, gastric ulcers and the presence of chronic limb lesions continued and was forwarded to OHRC upon completion of each case. New comparisons of injury data to OHRC racing information and expansion of breed differences was continued in hopes of extending the scope and impact of this program's usefulness. Analysis of comparison to "works" or "work-outs" was not attempted in 2012.

The Oklahoma Animal Disease Diagnostic Laboratory remains proud to be included as an integral part of the Veterinary Medical Diagnostic Program in cooperation with the Oklahoma Horse Racing Commission. The OADDL remains committed to accomplishing the goals outlined for this project and pleased to support the important racing and equine industries of the state.

Respectfully submitted,

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ACKNOWLEDGEMENT:

A special thanks is expressed to representatives of breed registries and track management who cooperated to contribute the end of meet data for calculation of a standard CMI index in 2012:

Debbie Schauf: Oklahoma Quarter Horse Racing Association.

Danielle Barber: Thoroughbred Racing Association of Oklahoma.

Dan Fick: Director of Racing, Remington Park.

Mark Enterline: Consulting General Manager, Will Rogers Downs

Ron Shotts: Director of Racing, Fair Meadows at Tulsa

SUMMARY TABLE: Veterinary Medical Diagnostic Program

	Racing	Training	Non-exercise	Accident	TOTAL
Remington Park:					
2003	10	2	1	0	13
2004	10	1	2	0	13
2005	14	5	3	2	24
2006	25	5	2	1	33
2007	14	5	3	2	24
2008	16	7	2	2	27
2009	23	4	3	1	31
2010	23	13	7	0	43
2011	24	2	5	2	33
2012	28	9	5	0	42
Fair Meadows:					
2003	4	2	0	0	6
2004	6	1	4	0	11
2005	5	0	0	0	5
2006	11	0	0	0	11
2007	11	2	1	0	14
2008	15	0	2	0	17
2009	3	1	1	0	5
2010	15	0	0	0	15
2011	11	0	1	0	12
2012	8	1	1	0	10
Will Rogers Downs:					
2005	0	1	0	0	1
2006	5	2	1	2	10
2007	5	1	1	0	7
2008	3	1	1	0	5
2009	6	2	2	0	10
2010	16	2	2	0	20
2011	16	4	5	0	25
2012	13	7	4	2	26