



THE COLLECTION

The Monthly Newsletter of the Iowa Dressage and Combined Training Association

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IaDCTA Board & Committee Information

BOARD MEMBERS

PRESIDENT

Robin Sprafka

rasprafka@aol.com

VICE PRESIDENT

Amanda Towery

amandatranquillo@yahoo.com

SECRETARY

Britni Taylor

Taylor.britni@gmail.com

TREASURER

Nena Denman

nkdenman@gmail.com

PJ Koehler

Pj_dressgebasics@aol.com

Amy Stoneking

iacowgirl@hotmail.com

Barb Zukowski

bluebam@netins.net

Melinda Antisdal

MGAJWF@aol.com

COMMITTEES

EDUCATION

PJ Koehler

Robin Sprafka

VOLUNTEER

Britni Taylor

Julie Moore

MEMBERSHIP

Nena Denman

FUNDRAISING

Sabrina Wright

Amanda Towery

Amy Stoneking

Britni Taylor

Barb Zukowski

NOMINATING

PJ Koehler (chair)

Robin Sprafka

Britni Taylor

Amy Stoneking

Amanda Towery

Nena Denman

Barb Zukowski

PUBLICITY/COMMUNICATIONS

Robin Sprafka

Katie Barrowcliff

SHOW

PJ Koehler

Carmen Pierce

AWARDS

Amy Stoneking

Amanda Towery

Sabrina Wright

Britni Taylor

Barb Zukowski

EVENTING LIAISON

Amy Stoneking

Sabrina Wright

swright88@hotmail.com

YOUTH LIAISON

Camryn Norton

WEBSITE MANAGER

Rick Hildreth

middlerriverranch@aol.com

COLLECTION EDITOR

Katie Barrowcliff

collectioneditor@hotmail.com

If you want to get involved in a committee, please contact one of the members listed!

PUBLISHING RATES for Clinics, Show Bills, & other ANNOUNCEMENTS

ANNOUNCEMENTS include clinics and shows. Member rates apply to clinics and shows sponsored by an individual IaDCTA member. Nonmember rates apply to clinics and shows sponsored by groups other than the IaDCTA.

CHANGE OF HAND is our classified advertising section. Each item is limited to a maximum of 20 words per month and each member is limited to 2 items per month.

CALENDAR OF EVENTS is our listing of local and regional events. It includes only the event name, date and contact information.

MARKETPLACE is our advertising for professionals and facilities. Submit any size listing for inclusion for the same rates as above. Ad placement will depend on size. A discount of \$10.00 per month applies to full page ads running for 6 consecutive months. Send all materials and announcements to:

Email: collectioneditor@hotmail.com

Mail: Katie Barrowcliff, 1330 44th St. Unit A, Marion, IA 52302

Please send payment for any submissions to Katie at the above address.

Materials are due by the 25th of each month and will not be printed until payment is received.

	Members	Nonmembers
Full Page	\$30.00	\$45.00
Half Page	\$25.00	\$35.00
Quarter Page	\$10.00	\$25.00
Business Card	\$7.00	\$15.00
Change of Hand	Free	\$5.00
Calendar of Events	Free	\$5.00
Marketplace	\$30.00	\$30.00
E-mail Blast	\$10.00	\$10.00



Next Board Meeting:

June 10, 2017

Maffitt Lake Farms

After horse show



The following forms can be found
on the IaDCTA website
(www.iadcta.org):

- * Show Recognition Contract
 - * Membership Form
- * Betsy Coester Guidelines and Application
 - * Year-End Award Guidelines
 - * Sponsorship Form

*IaDCTA is a USDF
Group Member
Organization (GMO),
and all members are
automatically USDF
Group Members
(GMs). For USDF
Participating
Membership,
members must apply
directly to USDF.*

We're Online:

**www.iadcta.org or
visit our Facebook
page**



June 2017

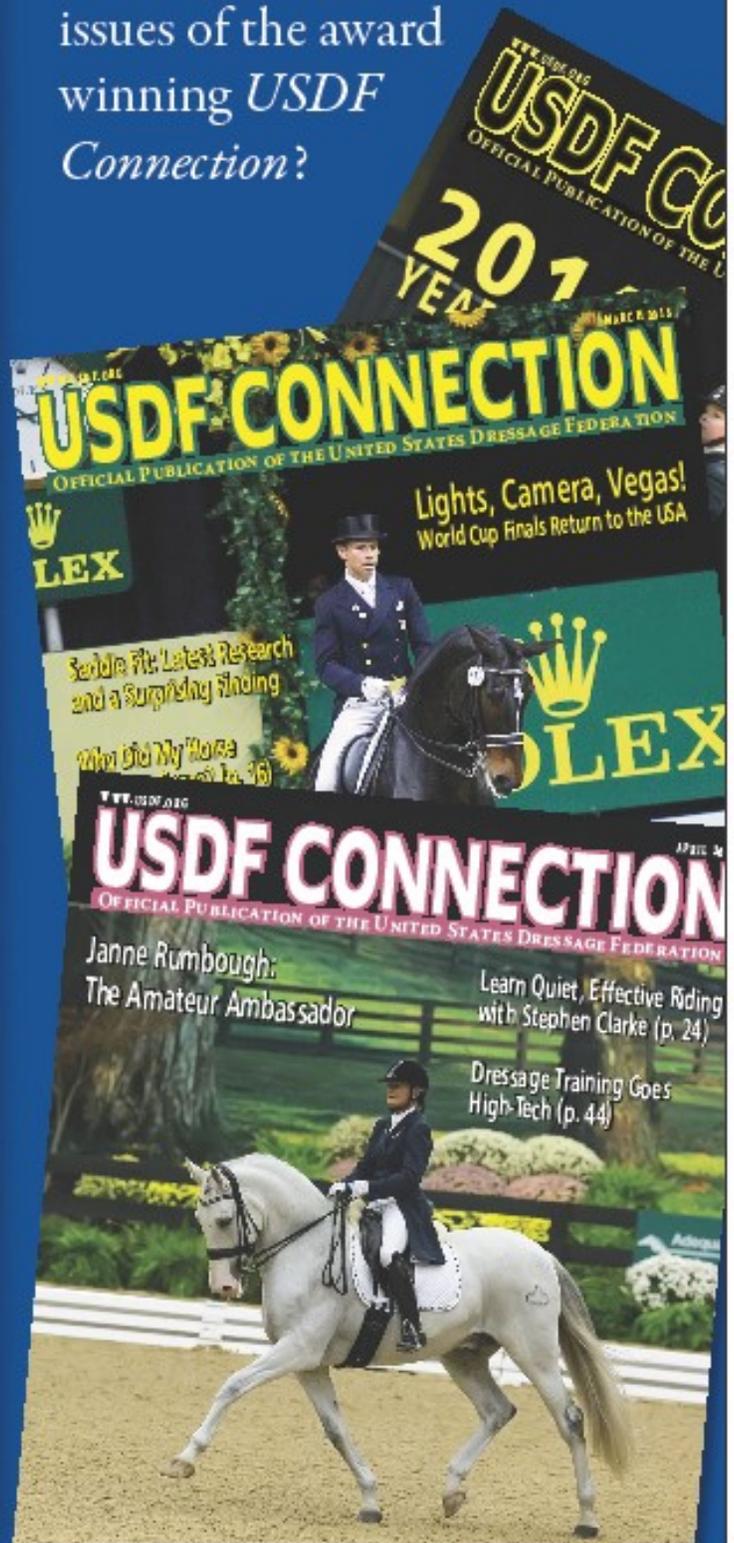
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3 Summer Eventing Camp at LR Eventing
4 Summer Eventing Camp at LR Eventing	5	6	7	8	9	10 <i>Dressage at Tamarack; Tamarack Stables, Ana- mosa, IA</i> <i>Maffitt Lake Dressage Classic I & II; MLEC, Cum- mings, IA (IaDCTA Board Meeting after show)</i>
11 <i>Maffitt Lake Dres- sage Classic I & II; MLEC, Cummings, IA</i>	12	13	14	15	16	17 MRR & DB School- ing Show; Middle River Ranch, Win- terset, IA;
18 Barry Fript Clinic; Middle River Ranch, Winterset, IA;	19 Barry Fript Clinic; Middle River Ranch, Winterset, IA;	20	21	22	23	24 Fantasy II; MLEC, Cum- mings, IA
25 Fantasy II; MLEC, Cum- mings, IA	26	27	28	29	30	

July 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8 <i>Dressage at Tamarack; Tamarack Stables, Anamosa, IA</i> <i>Part B of USDF L Education Program; Lincoln, NE</i>
9	10	11	12	13	14	15
16	17	18	19	20	21	22 Fantasy III; MLEC, Cummings, IA
23 Fantasy III; MLEC, Cummings, IA	24	25	26	27 <i>LR Eventing Cross Country Clinic; Leighton, IA</i>	28	29 Two Rivers Dressage Classic I & II; MLEC, Cummings, IA
30 Two Rivers Dressage Classic I & II; MLEC, Cummings, IA	31					

Did you know that as a member...

...you will receive complimentary issues of the award winning *USDF Connection*?



Minutes for 5/1/2017

Board members in attendance: Robin Sprafka, Britni Taylor, Amanda Towery, Melinda Antisdell, PJ Koehler, and Barb Zukowski.

Other members in attendance: Rick Hildreth.

Board Changes: Deb Johnson has resigned her board position with IaDCTA. Discussions were made about possibly replacing the board member and who would be a good addition to the board.

PJ Koehler moved to send Deb \$60 gift card to Texas Roadhouse as a thank you for her work as treasurer for the club. Melinda Antisdell seconded the motion. The motion carried and passed.

Rules Discussion: Some questions arose about eventing rules concerning 2-phase and 3-phase CT. The USEA rulebook was referenced and posted on the IaDCTA website.

Discussion on Rebuilding the Club: Discussed how to regain some old members that have not renewed their membership. Melinda offered to reach out to some previous members to get their feedback. The question was brought up about what should be the 2017 focus for rebuilding the club; what are members wanting to get out of their membership? We talked about adding a social aspect to the club to increase the comradery in the club. The May 13th tack swap is designed to fill this need.

Amanda Towery moved to have a IaDCTA hosted potluck party after one of the June 10th recognized dressage shows at Melinda's house. PJ Koehler seconded. The motion carried and passed.

Rick Hildreth offered to make the flyer for the event. Melinda Antisdell offered to donate the meat but all side dishes would be potluck. A small \$5 suggested donation to Betsy Coester scholarship will be requested. Tours of the new barn provided!

Education Committee Update: PJ Koehler is still working to secure the Dolly Hannon clinic for 2018 to be hosted in Eastern Iowa. Talked about possibly bringing in a big-name eventer to do a clinic for our CT members.

Awards Committee Update: LR Eventing turned in the scores for her first recognized event. The awards committee will be working on a spreadsheet for scores, but scores are also posted on the IaDCTA website.

Volunteer Hours: An idea was brought up to offer that members who attend a board meeting should receive one volunteer hour. Melinda moved to allow meeting attendance will receive one volunteer hour. Amanda seconded it. The motion carried and passed.

Regional Dressage Show: Melinda requested that laDCTA help with volunteers for the show. The laDCTA website will post it as a volunteer opportunity and send out an email blast.

Website Manager: A future committee? Have an assistant web master to train with Rick? A "tack for sale" tab will be added to the website. Stay tuned for instructions on how to post to the website.

The Collection: A discussion as a made about the current collection model. Amanda Towery moved to replace the current collection format with an abbreviated format. PJ Koehler seconded. Motion carried and passed.

The next board meeting will be held on June 10, 2017 during the laDCTA party at Melinda Antisdell's house (Maffitt Lake Farms).

Amanda Towery moved to adjourn the meeting. Melinda seconded. The meeting adjourned.

2:45 PM
05/08/17
Annual Basis

Iowa Dressage and Combined Training
Balance Sheet
 As of April 30, 2017

	Apr 30, 17
ASSETS	
Current Assets	
Checking/Savings	
Cert of Deposit - US Bank 2074	5,980.34
Checking - US Bank 2742	3,756.85
Savings - US Bank 6395	2,201.07
Total Checking/Savings	11,938.19
Total Current Assets	11,938.19
TOTAL ASSETS	<u>11,938.19</u>
LIABILITIES & EQUITY	
Equity	
Perm. Restricted Net Assets	
Betsy Coester Grant	845.97
Total Perm. Restricted Net Assets	845.97
Unrestricted Net Assets	11,092.14
Net Income	254.38
Total Equity	11,953.10
TOTAL LIABILITIES & EQUITY	<u>11,953.10</u>

Iowa Dressage and Combined Training Association's 2017 Road to the Championships

April 22-23, 2017- Laura Rietveld Eventing Spring Show; Leighton, IA

May 6-7, 2017- Fantasy I; MLEC, Cummings, IA

May 27-28, 2017- Iowa Arabian Mayflower Dressage & Sport Horse Show; IA State Fairgrounds, Des Moines, IA

May 28, 2017- Catalpa Corner Spring Show; North Liberty, IA

June 10, 2017- - Dressage at Tamarack; Tamarack Stables; Anamosa, IA

June 10-11, 2017- Maffitt Lake Dressage Classic I & II; MLEC, Cummings, IA

June 17, 2017- MRR/Dressage Basics; Middle River Ranch; Winterset, IA

June 24-25, 2017- Fantasy II; MLEC, Cummings, IA

July 8, 2017- - Dressage at Tamarack; Tamarack Stables; Anamosa, IA

July 22-23, 2017- Fantasy III; MLEC, Cummings, IA

July 29-30, 2017- Two Rivers Dressage Classic I & II; MLEC, Cummings, IA

August 12, 2017- Dressage at Tamarack; Tamarack Stables; Anamosa, IA

August 12, 2017- MRR/Dressage Basics; Middle River Ranch; Winterset, IA

September 9, 2017- MRR/Dressage Basics; Middle River Ranch; Winterset, IA

September 23-24, 2017-Fantasy Finale; MLEC, Cummings, IA

Championship Shows

September 23, 2017- COMBINED TRAINING AND EVENTING CHAMPIONSHIPS; Middle River Ranch; Winterset, IA

October 21-22, 2017- DRESSAGE CHAMPIONSHIPS; Ellsworth Community College; Iowa Falls, IA

Nominating Your Horse

If you have not nominated the horse that you want to show this year, you can do so by going to www.iadcta.org and clicking on the link on the homepage. The nomination fee is \$10.00, and along with 7 hours of volunteer time, you will be eligible for year end awards. You will not be able to use any scores from an IADCTA recognized show received prior to nominating your horse. If you have already nominated your horse when you renewed your membership or signed up as a new member, you are good to go. Any questions, contact Richard Hildreth at 515-205-2249 or MiddleRiver-Ranch@aol.com.

Members and Horse Nominations 2017

Updated 5/1/2017

*Rookie- First year of IaDCTA/USDF GMO membership

Junior Member

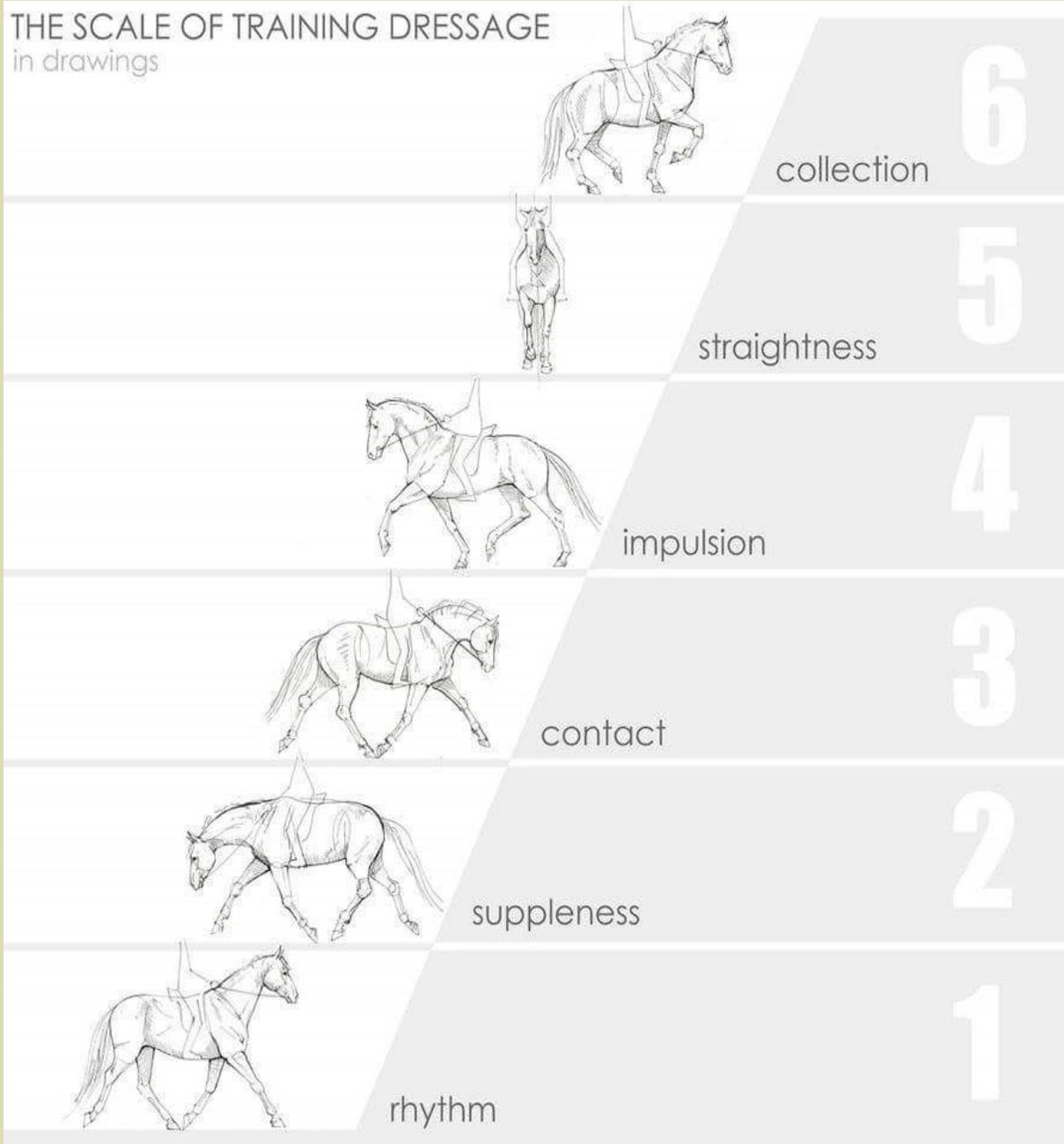
Numbers are supplied to the best of current knowledge

Member	IaDCTA	USDF	Horse Nomination
05/02/17 Amanda Ahrens	10502		
12/16/16 Linda Anderson	10476	153204	
12/01/16 Melinda Antisdell	10189	43022	
04/27/17 Natasha Arritt*	10500		
04/23/17 Mandy Aschoff*	10415		04/23/17 Friendly Glide/TB
12/01/16 Nicole Ayers	10469	211669	
04/25/17 Connie Avis	10236	179292	04/25/17 Nys Fane Hoogheland
01/08/17 Danielle Baker	10334	190130	01/08/17 Mystique
01/06/17 Katie Barrowcliff	10338	179287	
02/11/17 Samantha Bell	10455	210198	02/11/17 Tex
12/01/16 Kathryn Butterfield#	10435	209722	12/14/16 Buck
12/03/16 Amy Cone*	10475		
05/01/17 Diana Coughlin	10501	164182	
02/20/17 Debi Crews*	10482	214558	
02/20/17 Gary Crews*	10503	family	
12/01/16 Mary Curran	10108	17057	
12/01/16 Nena Denman	10111	7624	
03/12/17 Kelly Derry*	10493	215229	03/12/17 Oklahoma
12/01/16 Deb De Vries	10110	39149	
03/30/17 Lauren Doty#*	10496		03/30/17 Boy Blue
12/01/16 Rhiannon Dudley-Lucas	10360	43389	12/01/16 Built to Win
12/01/16 Mala Erickson	10413		
04/18/17 Amanda Fales-Williams	10497	193849	04/18/17 Huckleberry Finn
12/01/16 Carmela Feldman	10325	177741	
12/01/16 Leonard Foley	10167	family	
12/01/16 Molly Foley	10168	family	12/01/16 Athaena*M*/ATA
12/01/16 Patricia Foley	10169	12072	12/01/16 Aragonn/ATA
12/31/16 Pamela Gillam	10436	209724	
01/23/17 Sharon Greif	10480	190138	
02/20/17 Judy Hand*	10483	214559	
02/20/17 Mary Hanson	10484	161944	02/20/17 Cat 02/20/17 Mouse
12/01/16 Jane Heck	10258	164175	
02/02/17 Sharon Scandrett Hibdon	10440	176846	
12/01/16 Richard Hildreth	10468	family	
04/26/17 Libby Hott	10343	family	
04/26/17 Timmy Hott	10342	191269	
01/08/17 Deborah K. Johnson	10329	177713	01/08/17 H. Eros
01/02/17 Loline Johnson	10160	42920	01/02/17 Vienna

04/26/17 Alyson Kalsem#	10499	183079	04/26/17 Cufflinks
02/27/17 Daniele Kalsem	10488	183080	04/25/17 Luvabull Heiress/TB TIPP
02/27/17 Michele Kalsem	10487	42849	04/25/17 Mr. Pappagiorgio/TBTIPP
01/08/17 Kelly Kaut	10478	192567	01/08/17 Magic Victory
12/01/16 Pamela Koehler	10176	5260	01/08/17 This Magic Moment 01/08/17 Taking Chances
12/01/16 Tom Koehler	10177	family	01/08/17 Rowdy Yates 01/08/17 ThreezaCharm
03/30/17 Elizabeth Kraayenbrink*	10471		04/30/17 Nothing Artificial/AQHA
02/20/17 Carol Linnan	10131	59959	
03/08/17 Paula Meyer	10135	45060	03/08/17 Bravissimo
02/15/17 Elizabeth Miller*	10481	214560	
01/17/17 Jennifer Moore*	10479	213961	
02/10/17 Julie Moore	10211	174914	
02/01/17 Camryn Norton#	10448	185025	02/01/17 Coyote's Royal Gal
02/01/17 Lyndon Norton#	10449	family	02/01 17 Hannah Montana
01/19/17 Tracy O'Dell	10437	73994	
02/02/17 Lindsay O'Regan*	10489	215228	
03/12/17 Connie Otto	10492	176238	03/12/17 Panoramic
12/01/16 Lois Pienkos	10430	26700	
02/20/17 Carmen Pierce*	10485	214562	02/20/17 Addie's Edge
01/08/17 Katie Poling*	10477	214259	
01/01/17 Deb Pulver	10145	43687	
03/17/17 Laura Rietveld*	10495	132117	
12/04/16 Catherine Ross-Garron	10422	206061	
12/01/16 Robin Sprafka	10467	120147	04/26/17 Arthur
02/11/17 Carie Steinkamp*	10486	214564	02/11/17 Tempo Five
11/28/16 Camie Stockhausen	10154	30347	
01/08/17 Amy Stoneking	10459	210199	01/08/17 JP Shot of Whiskey
01/05/17 Heather Swarinski	10439	102379	04/26/17 WRA Maverick Ace 04/26/17 WRA Striken Gold
11/30/16 Tamara Swor*	10474	67335	
03/16/17 Trudy Tatum	10157	39202	
01/08/17 Britni Taylor	10457	210200	01/08/17 Italian Monarch
03/12/17 Sally Tracy*	10494		03/12/17 WildwycheBannedinBoston
12/15/16 Amanda Towery	10451	204621	01/08/17 Lady Kee 01/08/17 Lok's Got Tricks
01/08 17 Alyvia Tranquillo (Towery)	10452	family	01/08/17 Dakota
12/11/16 Derith Vogt	10309	114270	01/08/17 Carolyn's Courage 04/26/17 Helen Poco Blackburn
12/01/16 Meredith Watters	10161	8879	
03/12/17 Tristen Wigg #	10377	195620	03/12/17 Aba Daba Go 03/12/17 Cricket
04/18/17 Laurel Williams#	10498	193848	04/18/17 Huckleberry Finn
01/08/17 Heather Wilson-Roller	10472	105177	01/08/17 Moon 01/08/17 Leala 01/08/17 Bonnie

03/02/17 Sabrina Wright	10352	192566	03/02/17 Swedish Dala 03/02/17 Mattie
02/11/17 Lou Ann Wulf	10380	42836	02/11/17 Busy Kitty 02/11/17 Zoom Zoom
12/01/16 Barbara Zukowski	10166	16104	

THE SCALE OF TRAINING DRESSAGE
in drawings



Thermography: Diagnosis Tool for Horses

• By Kimberly S. Brown

• Oct 4, 2001

Scenario: Your event horse has just not been right. He seems to be getting a bit stiff to the right, and he's been grouchy when you are grooming him and getting him tacked up. No fever. No definite lameness. But something isn't right, you tell your veterinarian.



Courtesy Tracy Turner, DVM

Sinusitis on the right side.

You haven't given your practitioner much to go on, and he isn't seeing much when you walk and jog the horse. Forelimbs? Back? Hindlimbs? Feet? Everything is a question. He gets you to saddle the horse and walk him for a few minutes while he gets what looks like a video camera with a space-age lens out of his vehicle. He instructs you to stand the horse facing him in the closed-off barn aisleway, asking you if you've had wraps on the horse's legs or used any kind of liniments on the animal in the past 24 hours. No. Remove the saddle, please. He flips out a small viewing screen and proceeds to "shoot" your horse, from stem to stern, top to bottom. Then he stands up on a straw bale placed behind the horse and says, "Ah, ha!" He returns to his truck and comes back with a TV/VCR combo that he sets up. He turns on the monitor and puts in a video tape to record. He wires up his camera to the VCR, all the while explaining his unusual behavior. The camera is, in fact, an infrared detector. All living creatures give off infrared heat, he explains, and inflammation means greater heat than normal over injured areas. Decreased heat can mean injury, too, he adds. Your horse on the television screen looks something like what a modern artist would paint—various shades of black, blue, yellow, green, and red, with some white. The white represents the hottest temperature, your veterinarian explains, and the blue the

coolest. As it goes to shades of green to yellow to red to white, heat increases. (More than one color palate is available for the veterinarian to select the one he most prefers.) Then, back on the straw bale, he shows you why your horse is "off." The whole left side of his back along the spine glows yellow--not matching the greenish pattern of the right side. Heat patterns that don't match translate into a problem. A change in saddles and some therapy will have your horse back to his old self in short order.

Scenario: An obscure lameness is going on in a Warmblood stallion, somewhere in his hind end. This is not a stallion who is pleasant to work around. Blocking is low on the option list for fear of having someone injured. Out comes the infrared camera, which picks up a problem in a tendon that didn't show anything on palpation. Ultrasound is brought into use and shows (on the now-sedated horse) a small disruption in the fiber patterns.

The two scenarios described above are actual cases related by an equine practitioner who has used infrared imaging on world-class equine athletes for several years. Veterinarians excited about bringing infrared imaging into common use in the barns and on the backstretches of our equine competitions have been working with a company to develop a system specifically for use on horses. (See sidebar on eMerge Vision.)

Infrared Imaging

An animal's body creates heat so it can survive. That heat fluctuates throughout the body depending on blood flow. Blood flow, to some degree, is regulated by need; for example, injured tissues need more blood to bring in more helpful cells and take away the debris of repair. The body's recognition of injury and a subsequent increase in blood flow can happen even before the animal shows signs of pain, such as lameness. Enter thermography.

The infrared heat that a horse emits from its body can be "viewed" via a specialized camera and monitor. The heat patterns that can be seen show a trained practitioner how the blood flow is normal, or abnormal, in a particular horse. Blood flow can be either increased or decreased, both indications of health problems.

When horse owners hear the word imaging, most of the time they think of X rays, ultrasound, or perhaps scintigraphy. In fact, there are two divisions of imaging. Kent Allen, DVM, a member of the veterinary panel for the United States three-day event team, said that imaging should be thought of in terms of physiologic imaging and anatomic imaging. Anatomic imaging is what you can show—a broken bone or tear in a structure such as a tendon (X rays and ultrasound). This structural anomaly indicates a problem, but the image is static. Anatomic imaging only shows what has occurred. Anatomic images can be taken in a series over time and compared to help determine healing or lack thereof, and are needed for diagnosis after thermal (physiologic) imaging has pinpointed a problem area.

Physiologic imaging is a function of metabolic action. Physiologic images can change and might appear prior to anatomic disruption. Thermography (or thermal imaging) is considered physiologic imaging because as the horse's metabolism changes—a sore tendon heats up—that fact can be discerned. As one veterinarian said, "Thermography is a sifting device that you then go in and document the physiologic change (what you saw with thermography) with the anatomic change. It's not a stand-alone technique."

Thermography, according to *Dorland's Medical Dictionary* for humans, comes from the Latin words for "heat" and "to write." It is defined as "a technique wherein an infrared camera is used to photographically portray the surface temperatures of the body, based on the self-emulating infrared radiation; sometimes employed as a means of diagnosing underlying pathologic processes, such as breast tumors."

The Science Behind The Image

Thermography has been used in human and veterinary medicine (as well as in imaging for other purposes, mostly military reconnaissance) for many decades. All living creatures give off self-created infrared heat. (Machinery also gives off "heat signatures," which are used by military analysts to determine whether equipment or ships are being readied for travel or have been moved recently, and to detect numbers.)

There are different types of cameras or detectors that read infrared heat images. Some are quite bulky and require a cooling element to keep the camera at a set temperature. Cooled cameras require a "cool-down" period of 10 minutes or more prior to use. Others cameras are more modern, hand-held devices specifically designed for use around horses. Cost also is a consideration; cold systems could cost \$75,000 or more. However, the newer infrared imaging systems (such as the DTIS from eMerge Vision) can be purchased for about what a high-end ultrasound machine would cost (\$27,000).

Thermography has been around and studied since the 1960s. Early machines were costly, and cumbersome, and the maintenance was delicate. Other uses in the livestock industry have been tried, especially inside buildings where the rising body temperature of an individual animal in confinement could be an indicator of illness.

Thermography is a qualitative assessment of temperatures. In other words, the camera can be set to detect differences in temperatures and show those differences as colors. Usually, veterinarians like to set the temperature/color changes for every 0.5-1½ Celsius. It should be remembered that skin temperature in the normal horse is about five degrees cooler than core body temperature. The skin derives its heat from local circulation and tissue metabolism. Also, a horse is warmer down the inside of its body than the outside.

A "hot spot" indicates inflammation or increased circulation. Hot spots generally are seen in the skin directly overlying injury. A cold spot is a reduction in blood supply usually due to swelling, thrombosis, or scar tissue.

Uses of Thermography

At the 1996 Olympic Games in Atlanta, where there was millions of dollars' worth of equipment available to the equestrian teams, the most-requested diagnostic tool was thermography. It was fast. It was portable. It was non-invasive. It could detect injury sites before they became lameness problems, and could guide practitioners to specific anatomic areas for study using other diagnostic techniques. And it was extremely accurate when used by an experienced practitioner.

There can be "artifacts" found when using a thermography camera, so experience is a key to diagnosis. If legs have been wrapped, or blisters or liniments have been used, they will show up as areas with increased heat. If there is a strong breeze blowing through the barn, it also can affect imaging. Long hair coats are not as good as short hair coats in allowing infrared heat to escape (hair is an insulator). Horses which are clipped for winter with patterns of long and short hair also can present problems with imaging, as can horses with mud caked over parts of their bodies.

The motion of the horse must be controlled, as must be extraneous radiant energy (don't stand the horse with one side next to the open door of a warm tack room or in direct sunlight). The horse should be given 10 minutes or more to acclimatize to the area where the thermography imaging will be done. Thermal symmetry is the rule—you compare one anatomic area with the same area on the other side (i.e., outside foreleg to outside foreleg). Changes of one degree Celsius over 25% of the comparable anatomic structure usually are clinically significant.

Thermography can be used to determine if there is inflammation in an area that was sore on palpation, or to detect an area of increased blood flow when there is no specific pain or signs (subclinical inflammation). Most horses don't have just one problem associated with a lameness. Thermography also helps in detecting the secondary areas with problems. Tracy Turner, DVM, MS, Diplomate ACVS, noted that tendons and joints will show inflammatory changes as much as two weeks before clinical lameness is apparent.

Thermography also can be used to assess the vasculature and blood flow to tissues before and after exercise. Other uses include prepurchase examinations, saddle fit, a training aid to avoid injury (i.e., detecting hot shins before they buck), pre-race examinations, hoof balance, track design or footing (based on hoof heat of horses performing over the surface), detecting early laminitis, palmar heel pain, subsolar/submural abscesses, diagnosing capsulitis/synovitis in joints, tendinitis, following tendon healing after injury, viewing muscle injury, detecting muscle atrophy, muscle strain, and nerve injury.

Turner noted that with capsulitis/synovitis, as the joint becomes inflamed, the thermal pattern changes to an oval area of inflammation just over the joint. This pattern might become

evident two weeks prior to the onset of clinical signs. He said that the pattern is similar for tendinitis. A hot spot occurs over the injury site that can be detected about two weeks before there is evidence of swelling and pain over the tendon. He also noted that as tendons heal, the temperature becomes more uniform, but remains elevated. "Thermal changes correlate well to structural reorganization," he noted. The most valuable use of thermography, according to Turner, is in detecting muscle injury.

"It locates the area of inflammation associated with a muscle or muscle group," he said. "It shows atrophy before it becomes apparent clinically. Atrophy is seen as an area of consistent decrease in circulation when compared to the opposite side."

Turner said that while muscle strain in the forelimbs is rarely seen, he does find strains in the pectoralis muscle and shoulder extensors. The most common muscle strain in the hind limb is best described as in the croup region, and the caudal and cranial thigh region.

Nerve injury due to direct trauma or secondary to another injury or disease can affect blood flow and can be visualized with thermography, said Turner.

As can be seen, there are many different uses for this non-invasive, but reliable diagnostic tool. It is thought that many practitioners will become well-versed in the subtleties of using thermography, and their patients will benefit from this advance in equine veterinary medicine.

eMerge Vision

What happens when a company with extensive background in thermal imaging wants to develop application-specific infrared technology for biomedical applications and puts a horse person as project manager? The DTIS 500 thermal imaging system for equines is built and eMerge Vision is born.

John Thompson, who has cutting horses in Florida, is in the business development end of XL Vision and Safeguard Scientifics Partnership Company which spun off eMerge Vision. He met Kent Allen, DVM, at the 1996 Olympics, where a thermography camera that cost more than

\$60,000 was being used. In fine-tuning the technology for the horse industry, Thompson and eMerge Vision have worked closely with veterinarians and researchers familiar with competition horses and thermographic imaging to create what he called a "cost-effective diagnostic tool."

The parent company has for years worked with thermal imaging for mapping systems, reconnaissance, and medical imaging, and was looking for ways to commercialize previously government-used technology.

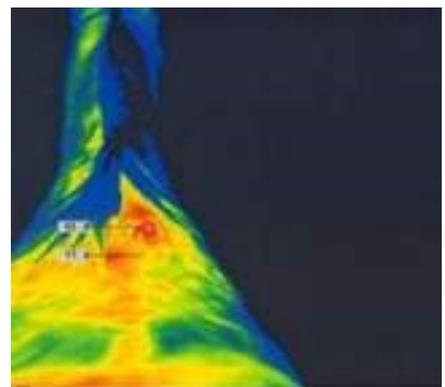
The equine cameras are made out of a fiberglass re-enforced material to survive the rigors of being used around horses and in barn situations. The camera was developed with a memory card that could store 60 individual images that can be transferred to a laptop or other computer for permanent storage. The camera also interfaces with a TV/VCR combination to allow images to be recorded and/or be seen live by more than just the operator.

The camera is battery operated so there are no extension cords to restrain where it can be used or to get tangled up around the horse. A computer can connect directly into the camera, with software designed specifically for use with equine imaging (still or video). The computer also is adapted to store other types of images (ultrasound, endoscopic, or scintigraphy) for use in keeping case logs on horses. The computer is built to be compatible with other computer systems that might be used in the veterinarian's office or clinic.

About the Author

Kimberly S. Brown

Kimberly S. Brown was the Publisher/Editor of *The Horse: Your Guide To Equine Health Care* from June 2008 to March 2010, and she served in various positions at Blood-Horse Publications since 1980.



Hotspot on withers

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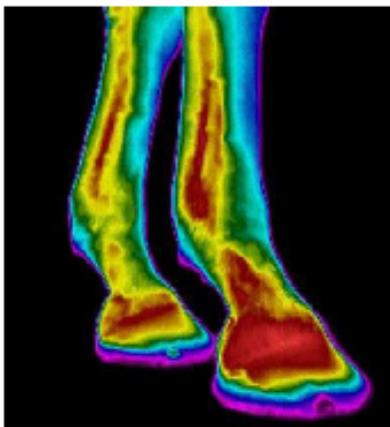
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Equine Thermography

• By Joanna L. Robson, DVM, CVSMT, CVA, CSFT, CIT

• Jan 30, 2017

Thermography presents a noninvasive, safe, and cost-effective diagnostic imaging modality (on average, \$350 for a whole horse scan and interpretation) that is a valuable complementary tool in equine health care. As with other technologies, we are seeing considerable advancements in thermographic cameras' resolution and user-friendliness, along with significant decreases in physical size and initial purchase costs. As thermography gains popularity and interest, it is tremendously important that veterinarians, technicians, and horse owners understand the advantages this physiologic imaging tool offers, as well as its limitations.



Comparing parts left-to-right is key to interpreting images, with the horse as its own control. Photo: Joanna L. Robson, DVM, CVSMT, CVA, CSFT, CIT

The first step in understanding what thermography can and can't do is learning the difference between anatomic and physiologic imaging. Anatomic imaging, which includes radiographs, CT scans, and MRI, reveals to the practitioner a specific affected area. These techniques show one static moment in time of a body part and are not sensitive to metabolic changes in blood flow or nerve conduction. Physiologic imaging is dynamic and sensitive and includes nuclear scintigraphy (bone scan) and infrared thermography. The latter might detect metabolic changes related to active inflammation, blood flow, or nerve conduction. Veterinarians

typically follow thermography with anatomic imaging to diagnose the underlying disease process at a specific area of activity or concern.

So how does thermography work? The thermographic camera detects infrared waves on the body surface that are invisible to the human eye and converts them to an image we can see. Consider what happens when you injure yourself: You bang your knee; the area becomes hot, red, and inflamed; and at a cellular level as an immune response, the body releases chemicals such as histamine. Changes in blood flow might directly correlate with inflammation. Thus, at the most basic level, where there is increased circulation there might be inflammation (becoming warmer). The opposite is also true: With chronic disease, scarring, atrophy (muscle wasting/loss), nerve damage, or disuse, areas might become cooler.

Symmetry is key when interpreting images. By comparing a horse's parts left-to-right, the individual patient serves as its own control. Also consider that a horse with an injured right front flexor tendon, for example, might be offloading from the sore leg to the opposite (left front) limb or even the hind end. With a whole horse scan, veterinarians can detect these compensatory problems, begin treatment, and prevent further injury.

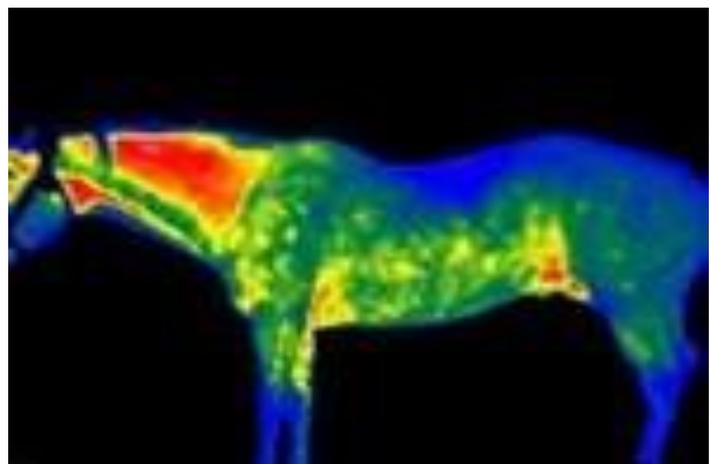
Performance-limiting or career-ending conditions such as kissing spines, tendon/ligament problems, and soreness from poorly fitted saddles, hoof abnormalities, arthritis, and cervical injuries all produce patterning detectable with thermographic cameras. Thus, thermography has wide applications such as for lameness localization, saddle-fitting evaluation, prepurchase evaluations, shoeing and trimming assessment, arthritis detection, pre- and post-chiropractic or acupuncture or massage treatment/evaluation, serial assessment of soft-tissue healing, tendon/ligament evaluation, and more. Researchers have shown that they can use thermography to detect tendon/ligament injuries up to two weeks prior to evidence of clinical lameness, as well as subclinical hock inflammation prior to bony changes. Scientists also use thermography in research settings to evaluate physiologic responses to medications, equipment such as equine treadmills, and laminitis and diseases of the hoof. It is important to remember that the camera reads surface temperatures and does not penetrate; thus, veterinarians cannot use it to evaluate deeper structures.

Environmental considerations and patient preparation and positioning are crucial for maximal results. Exposure to sunlight, radiant heat, moisture, and wind can ruin a scan and wreck image and interpretation quality. Also consider other insulating factors, such as long hair coats, feathers, boots, or blankets, when preparing the patient. When veterinarians use a standardized approach to preparation and imaging, thermography can be a practical tool for equine care.

About the Author

Joanna L. Robson, DVM, CVSMT, CVA, CSFT, CIT

Joanna L. Robson, DVM, CVSMT, CVA, CSFT, CIT, is the owner of Inspiritus Equine Inc., an integrative equine veterinary practice in Napa, California.



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