



SEEING RED

The equine industry takes great pride in its animal welfare. Through the use of infrared thermography, injury detection leaps into the 21st century.

What do suspensory ligament injuries, laminitis, sore backs, fractures, arthritis, and sole bruises have in common? These diseases all have a significant impact on equine performance, and all can be detected with infrared thermography. Infrared thermography (IRT) was first introduced to the equine industry 40 years ago, but the technology at that time was limited, cumbersome, and misunderstood. In the last 5 to 10 years, significant advances have been made in

thermal imaging technology that make this tool a significant and viable option for equine diagnostics.

WHAT IS IRT?

IRT utilizes a specialized camera that detects infrared waves and converts them into an image visible with the human eye. Heat emitted from the surface of the patient is directly correlated with circulation, which in turn depicts areas of

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Imaging the horse's feet shows how the horse is landing and Farriers can make adjustments based on thermal images.
Photo: Erpelding Photography



inflammation or increased bloodflow. While thermography is generally considered to detect "hotspots", some of the more significant detectable lesions may be cool areas where nerves and blood vessels have been damaged.

Thermography is a physiologic imaging modality, meaning that the changes in circulation are readily detectable, compared to radiographs (x-ray) or ultrasound which depict anatomic structures. IRT is a diagnostic tool that can readily enhance other diagnostic modalities, but which stands on its own for a few significant advantages:

- Thermography is safe and does not expose the patient or handler to radiation.
- The standardized imaging procedure is fast, with an entire patient imaged in twenty to thirty minutes.
- The procedure is done without sedation or anesthesia, thereby eliminating the risks associated with drugs and recumbancy.
- Thermography is a whole horse imaging modality that depicts compensatory problems, localizes lesions, prevents injury, and monitors healing.

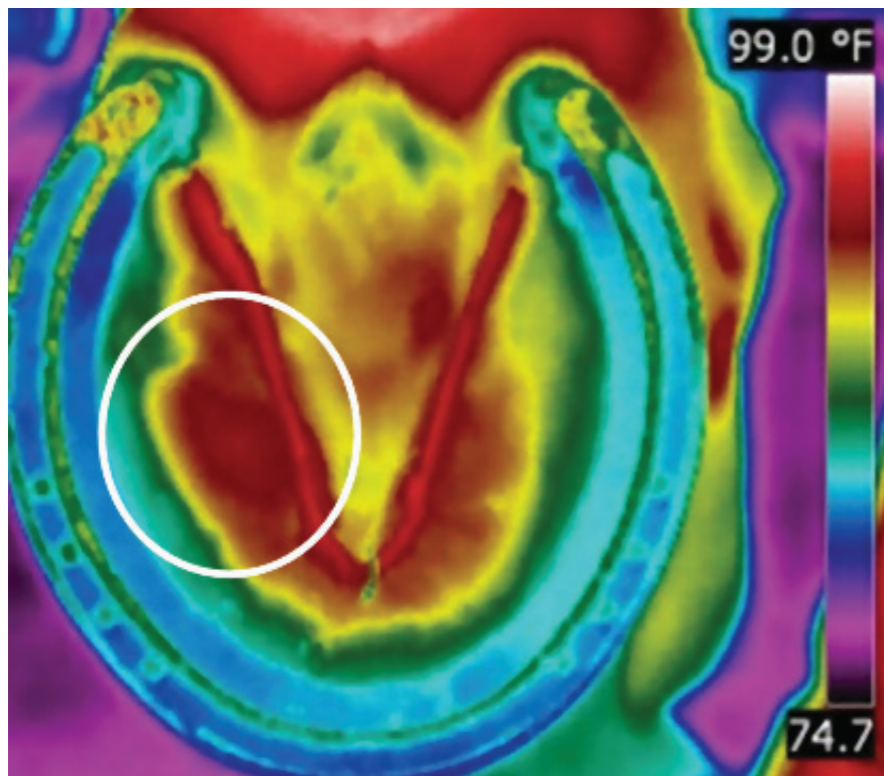
COST BENEFIT ANALYSIS

What does this amazing technology cost? A whole horse scan and full veterinary interpretation of the images runs an average from US\$250-\$400. There is simply no other tool on the market presenting



One of the key benefits of IR technology is that it is completely non-invasive for the patient. Whether assessing upper limbs (above) or checking for spine damage (below) the horse and handler are always at ease – unless of course they become camera-shy.
Photos: United Infrared, Inc





5 Farriers can use IRT to evaluate hoof balance, detect bruises or abscesses, and check for laminitis.

the whole horse in a diagnostic light at such a reasonable cost without the risks. IRT has many roles in the equine industry. Notably, the tool is effective at localizing mystery lamenesses, and as an injury prevention tool for sport and race horses in competition. The cost of a full-horse scan is low enough for horse owners to afford to get baseline imagery of the horse – even when no problems are present at the time. If the horse later becomes injured, the imagery can be compared to the baseline for improved diagnosis.

IF THE SHOE FITS

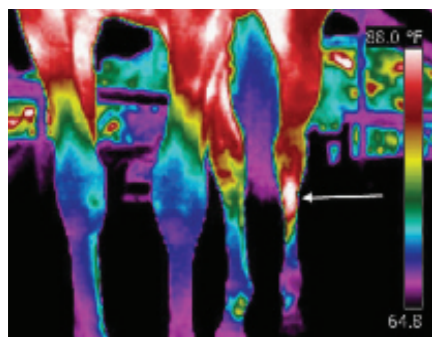
IRT is also gaining acceptance with farriers who use the tool to evaluate hoof balance, detect bruises or abscesses, and detect laminitis. The Fédération Equestre Internationale, the international governing agency for equestrian sport, has accepted thermal imaging as an appropriate tool for maintaining ethics in equine sport, and uses IRT to detect soring and hypersensitization. Other uses include monitoring of rehabilitation and healing, detection of fever or infectious disease, and pre-purchase evaluations.

Peter Hopkins, vice president of United Infrared, one of the largest groups of thermographers, has stated that the interest in equine infrared evaluations has skyrocketed, and the interest United Infrared has received for its EquineIR training and service product has been amazing. "We are truly making a difference for the horses and the owners with equine thermography. Our members come in with a desire to learn how to take correct images, and leave with a newfound appreciation for the horse in sport." And correct education is the key to the continued success of thermal imaging as an equine diagnostic modality. Dr. Joanna Robson, Veterinary Technical Director for EquineIR adds, "Standardization is imperative. It's not enough to take pictures with a fancy camera. The patient and environment must be correctly prepared, and the veterinarians looking at the pictures need to correctly understand what it is they are looking at." Dr. Robson is an equine veterinarian and a certified infrared thermographer. She utilizes thermography in her equine practice on a regular basis for lameness evaluation, saddle-fitting, and health maintenance.

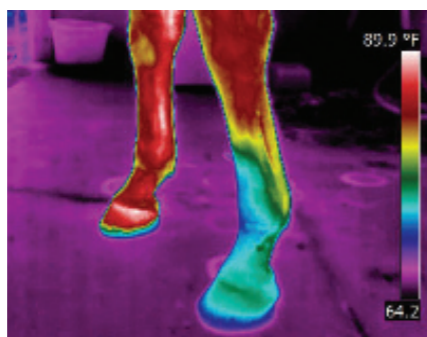
With ever-increasing rigorous demands on our equine athletes, and public outcry for the welfare of the horse in sport, equine thermal imaging is finding its niche as a safe, rapid, and effective diagnostic imaging tool that not only localizes problems, but has the power to prevent injuries and catastrophic breakdowns.

Scan A (top right) depicts the lower limbs of a racehorse that was scanned prior to a scheduled race. The left front hoof was significantly hotter than the right in the images and warranted further

EXAMPLES OF IRT AT WORK IN THE EQUINE INDUSTRY.

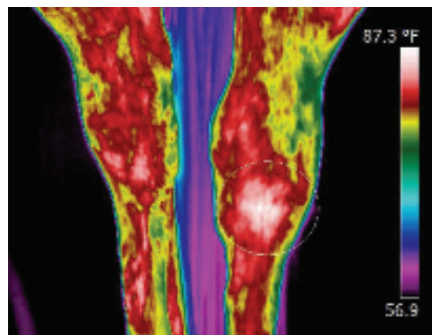


6 This horse's life was potentially saved when the scan revealed a fracture in the cannon bone, causing it to be held back from a race. Years later the same horse went on to win the Breeders Cup in 2009.

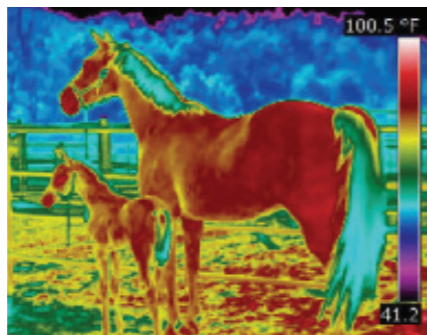


7 Vasoconstriction and circulatory disruption in a mare with navicular syndrome and nerve damage.

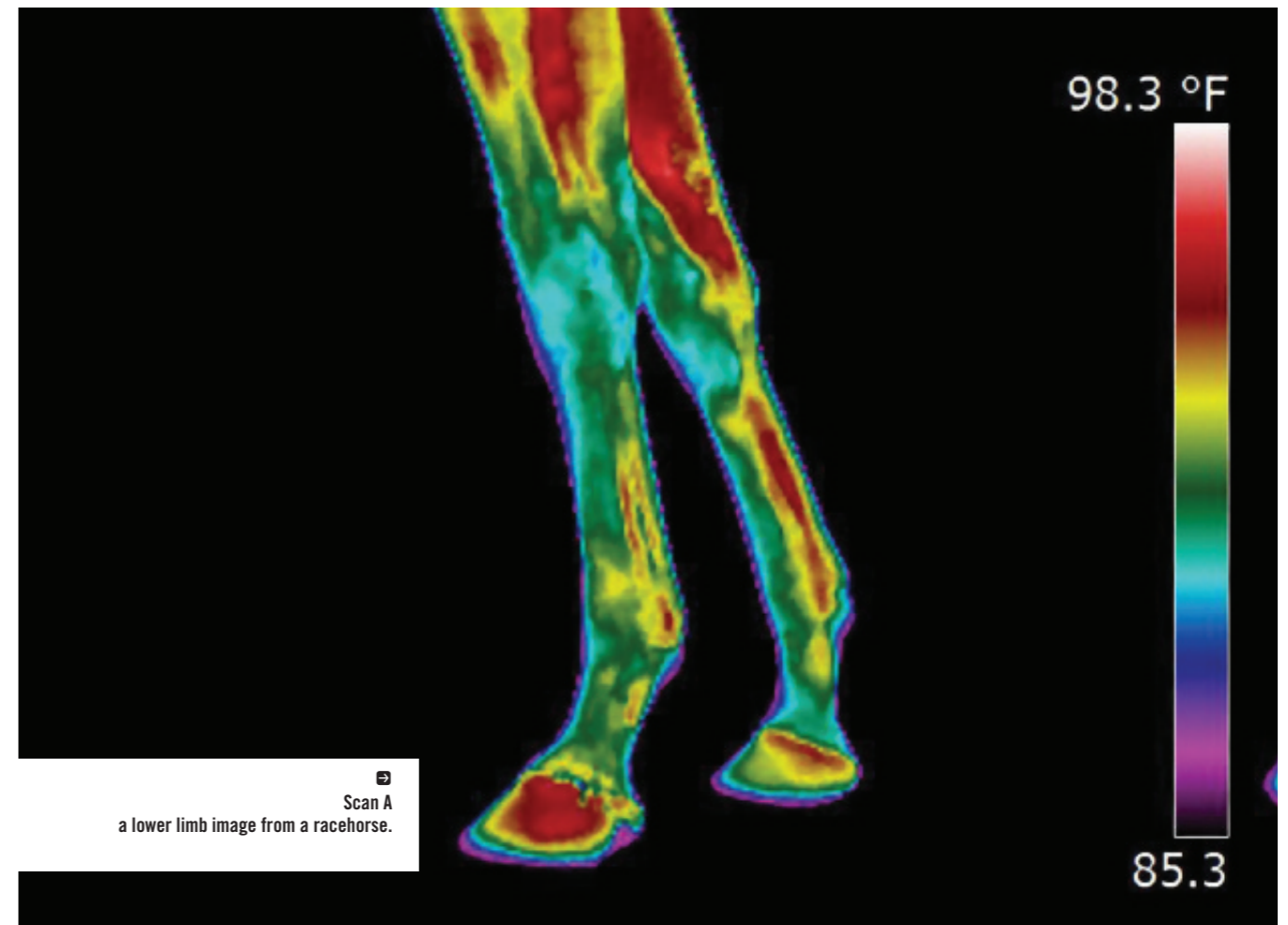
All Photos: United Infrared, Inc



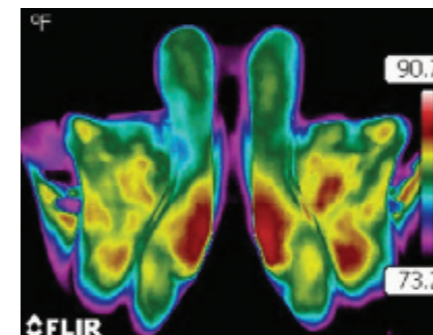
8 Significant inflammation in the left hock, confirmed as a large bone spur and joint degeneration.



9 The well-being of the animals has always been at the forefront of IRT development in the equine industry.

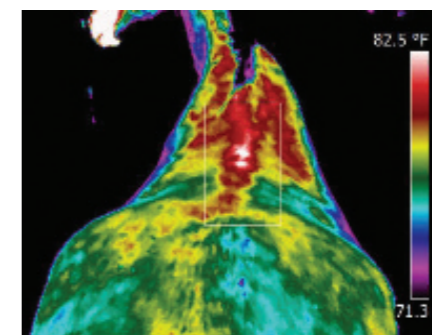


10 Scan A a lower limb image from a racehorse.



11 IRT can be used to evaluate saddle-fit and rider balance, the hot spots reveal the areas of pressure.

evaluation. The trainer opted to run the horse, and the patient blew out the left front hoof wall during the race. This lesion was detected with the camera and the subsequent injury could have been prevented. IRT can detect soft tissue inflammation in tendons and ligaments up to two weeks prior to any overt signs of lameness. This is a significant advantage in preventing long and expensive layups in performance horses.



12 Over-riding Dorsal Spinous Processes (Kissing Spines) confirmed in an older Arabian gelding.

IRT is also effective at evaluating saddle-fit and rider balance problems. Friction and pressure create heat that is readily detectable, thereby highlighting pinching, imbalanced saddles, and back pain. Inflammation associated with over-riding spinous processes, vertebral rotation, paraspinal muscle inflammation, dorsal spinous ligament injury, and more are all visible with infrared thermography.

FURTHER INFORMATION:

To find out more about IRT and its benefits to the equestrian world please visit

EquineIR: www.equineir.com
Integrated Equine Infrared: www.ieinfrared.com

Infrared Camera Manufacturers
Flir Systems: www.flir.com
Fluke: www.fluke.com
Process Sensors: www.processsensors.com

Infrared Training for Equine, Certification and other Applications:
United Infrared: www.unitedinfrared.com
Infraspection Institute: www.infraspection.com
Infrared Training Center: www.infraredtraining.com

Thanks to Dr Joanna Robson DVM, Peter Hopkins and the United Infrared team for their work in compiling this article.

