Thermography
more than just a last resort?

by Jean Koek

Thermography, or infrared imaging, uses an infrared imaging and measurement camera to ‘see’ and ‘measure’ heat, or more precisely thermal energy, emitted from an object.

While currently thermography is generally turned to as a last resort in difficult to diagnose cases, Jean Koek believes its greatest strength lies in helping identify the warning signs before they become health problems.

From saddle fit issues to hoof abscesses and snake bite, thermography is a useful addition to the diagnostic toolkit.

This article explains how thermography is being used by veterinarians and therapists, and includes examples of successful case studies.

Infrared energy is light that is not visible to the human eye and it is the part of the electromagnetic spectrum that we perceive as heat.

In the infrared world, everything with a temperature above absolute zero emits heat. Even ice cubes emit infrared.

Walking through a paddock at night glued to your infrared (IR) camera screen, it’s fascinating to see the heat signatures of individual blades of grass and leaves. It is also a great way to find the horses in a big paddock at night, as well as avoid things that crawl in the dark. Yes, even those that are cold-blooded can’t hide from the IR camera.

There is plenty of general technical information available online about thermography, and if you would like to see a wide range of fun animal images just Google ‘NASA Infrared Zoo’.

The camera

A thermographic camera is a tool which gives an overall thermal picture of the body, often identifying previously undetected problems. This may well show that the primary problem is somewhere other than where the animal appears to be sore.

Thermography is a quick, non-invasive way of getting a thermal overview of the whole body.

The general reaction to the word ‘thermography’ is (“oh yes, hot spots”) but it really is about overall thermal balance and, in fact, it is often a cold area (cold due to a lack of circulation or oedema) that can be the key to identifying the problem.

A controversial start

For the past forty plus years, the use of thermography in the medical and veterinary fields has been controversial, often with very vocal opposition. In spite of this, a dedicated group of doctors and veterinarians, including Queensland’s Dr. Jim Stenhouse, have persisted in its use and encouraged its development, so that currently, more and more medical and veterinary clinics around the world are using the technology successfully.

Thermography by itself does not diagnose, but is a useful addition in the diagnostic toolbox. However, over the years of development, many thermographic patterns have been found to be consistent with specific conditions and thermographically-savvy veterinarians will diagnose from a thermographic image.

Although thermographic images measure only skin temperature, they also reflect alterations in the circulation of deeper tissues.

The scanning environment

Because a thermal camera only reads surface temperature, there are many external factors such as hair length, sunlight, wind, water, dirt, liniments, rugs, boots and bandages to name just a few, which can affect the readings. Therefore, the scanning environment, correct preparation and allowing the horse’s body to acclimatise to that environment are extremely important.

Many thermographic services offer scanning of just ‘front legs’ or ‘hind legs’ or ‘back’ and thermographically-savvy vets can work with this. However, as an Equine Muscle Release Therapist (EMRT) I have always considered the body as a whole. Thermography has reinforced this approach as nothing in the body happens in isolation. I always scan the whole horse.

Over the years of development, many thermographic patterns have been found to be consistent with specific conditions and specialist veterinarians will diagnose from a thermographic image.
Maybe the condition is presenting clearly as a tendinitis, or sore back or temperament change, but thermography will help identify other imbalances that perhaps caused the problem and also how that condition is impacting on the rest of the body. Most good hoofcare professionals and body workers are now looking at the horse’s body as a whole.

Case studies

When I think of examples which best epitomise the usefulness of the technology, two horses always leap to mind.

Case 1

For several years the owner of 7-year-old ‘Betsy’ had been told by a wide variety of practitioners that she was imagining the horse had any problems. Substantial money had been spent on inconclusive tests and treatment. As a scientist, the owner understood thermography and asked me to look at Betsy, and in particular investigate the saddle area and saddle fit.

Thermographic assessment for saddle fit is a lengthy process, which involves the horse being lunged and imaged several times. With Betsy we tested two saddles so, by the time we’d finished she was well warmed up and we had a good selection of both digital and infrared, full body and back images.

To our surprise we discovered that Betsy was warming up on one side as one would expect but not on the other. Her history told of problems that occurred immediately after birth and we were able to link these to the restriction we were seeing. After several veterinary chiropractic and acupuncture treatments Betsy has gone from strength to strength.

Case 2

Ann Slattery’s beautiful imported grey FEI Dressage mare ‘Silvery’ slipped while working in trot in May 2009 and hyperextended her off foreleg.

She seemed fine for several days afterwards, until one morning she could not put the leg on the ground when she got up from a roll. For six months she underwent a wide range of tests and therapies, none of which got to the root of the problem. She had to be confined, as when she was put outside she panicked, constantly stamping the off foreleg.

The prognosis was not good. As a last resort thermography was called for and showed that the off fore was some 11°C colder than the other legs. NSW Dressage Manager Jenny Carroll, who is also an equine and human massage therapist, was with us and worked on the horse, first gently stretching the leg. The 30+ images taken during the hour long treatment show the circulation returning to the leg. Three months later, Silvery competed in her first Grand Prix.

In both cases I’m not sure what other technology could have shown these facts so promptly and inexpensively. In both cases the owners had spent large amounts of money for inconclusive results prior to thermography.

Like all diagnostic tools, thermography has its drawbacks and limitations, but its success in identifying areas of concern for further investigation is finally being acknowledged. This is happening especially overseas, but Australia is getting there.

The early warning signs

As the stories show, thermography is generally turned to as a last resort, whereas its greatest strength may lie in helping identify potential problems.

Clinical trials with Thoroughbreds at the track in the US and elsewhere have proved conclusively that thermography identifies problems in tendons and ligaments weeks before the trainers suspect there is anything wrong. Regular scanning of horses can therefore enable the rider to make adjustments to their training program and scanning the rider as well helps minimise uneven riding.

Other uses

Developers of many hands-on therapy courses are finding thermography invaluable as a teaching tool and I’m delighted to be involved with many of these. Equine Muscle Release Therapy, Founder and Director, Ali Coward, has just bought an IR camera for research purposes and the Equine Body Therapy (EBT) programme will be incorporating thermography as a teaching aid.

For many years, Master Farrier Andrew Bowes and I have spent considerable time pouring over images and we’re finally working on how we can incorporate more useful thermographic images in the Equine Podiotherapy Diploma.

Pauline Moore (www.gravelpoohof.org), a dear friend for nearly 20 years, considers the IR camera to be a valuable tool in studying heat patterns in the feet of ‘metabolic’ horses.

My dozen or more years working with thermography have been the most rewarding of my life and I have the privilege of working with some fantastic far-thinking vets both in Australia and overseas.

I’m currently extending my video work with horses on treadmills.

It’s an exciting time to be involved with this technology which one day may be the first port of call, not a last resort!

From the vets

by Dr Ian Bidstrup (www.spinavet.com.au)

Thermographic imaging of horses is coming of age!

Images and software are all making the latest thermography cameras much more useful pieces of equipment. Coupled with these advances is a much better understanding of the complexity of the images, including the common pitfalls that can lead to the misrepresentation of what the images portray.

When dealing with the spine, thermographic images can not only provide information about spinal segments which are inflamed, but also areas showing increased or decreased blood flow in association with changes in the activity of spinal nerves as we see with spinal dysfunction. These changes can involve the associated spinal segments, but may also involve regions served by the nerves from the segments as far away as the horse’s head or feet.

by Dr Lindsay Elliott, BVSc

In the right hands, Infrared imaging is a significant aid to veterinary diagnostic lameness and injury in the horse, both ruling out those areas not involved and identifying those involved.

The heat patterns in infrared reinforce the accuracy of diagnostic trigger points, which relate to associated joints, muscles and tendons.

It is very good for illustrating solar bruising, compensatory weight shifting lameness, foot abscesses, laminitis and shin soresness, as well as; fetlock, knee, high suspensory, hock, soft tissue/muscle and vertebral inflammation.

About the author: A run-in with breast cancer in 1994 caused Jean Koek to forsake the corporate world for that of complementary medicine. Her first steps were to become an Equine Muscle Release Therapist (EMRT) and human Bowen practitioner. For the past 13 years Jean has travelled and studied extensively with thermography, in both the animal and human fields. Lessons learnt in the human field have been invaluable with animals. During this coming year Jean will be studying acupressure with Dr Kerry Rodgers and undergoing the first year training of the Equine Podiotherapy Diploma.