

Legality Associated with the Use of Infrared Thermal Imaging in Veterinary Medicine

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SUMMARY

Infrared thermography has been used in veterinary medicine since the early 1960's. In the 1970's and 1980's, significant scientific advances were made in both human and veterinary medicine. The purpose of this presentation is to make everyone aware that the USDA-APHIS (United States Department of Agriculture and Animal Public Health Inspection Service) has used thermography since early 1970's to help enforce the Horse Protection Act of 1970. In the 1990's APHIS took a position that physical examination was sufficient for diagnosis of abuse and discontinued the regular use of thermography for enforcing the Horse Protection Act. A recent ruling by a federal judge has prompted APHIS again consider the use of thermography as a means for additional documentation if the horse was sore or not. The efficacy and practicality for the use of thermography has been demonstrated in numerous clinical and research studies as a diagnostic tool for veterinary medicine.

1. INTRODUCTION

In 1970 the Horse Protection Act was passed by the United States Congress to ban the use of chemical and mechanical means of “soring” of horses. It was common practice in the 1960's and 1970's, with Tennessee Walking Horses, to use mechanical devices (boots, rollers, chains) on the horse's front legs to enhance their performances. Chains of various weights were applied to the mid pastern region of the thoracic limbs for the purpose of causing exaggerated limb action during show. There was also some evidence that mustard oil was applied to the skin of the mid pastern to further enhance the horse's performance. Use of these devices induced irritation of the skin, causing inflammation with scarring in the pastern areas.

To prevent this abuse, the Horse Protection Act was passed. Just to use physical examination, including digital palpation, was not a reliable enough source to prosecute the horse owner or the trainer in a court of law. This lack of reliable information obtained by physical examination of the horse prompted the USDA-APHIS (United State Department of Agriculture and Animal Public Health Inspection Services) to fund studies for the diagnosis of “soring”. Thermal imaging was then used by Nelson and Osheim in Iowa (1) and Purohit et. al (2, 3, 4) at Auburn University to

perform studies for the diagnosis of inflammatory processes in horses in response to various chemical and physical factors.

2. MATERIALS AND METHODS:

Early studies were done using thermography to establish normal thermal patterns of the horses and specific attention was directed towards thoracic and pelvic limbs. During these studies, standards were established for the use of infrared thermography in veterinary medicine. Auburn University studies were also done to document thermographically assisted diagnosis of various inflammatory processes.

3. RESULTS

Auburn University studies resulted in revision of the Horse Protection Act in 1983. This revision was also followed by implementation of new guidelines imposed by the USDA-APHIS. Along with physical examination and evaluation of horses for show purposes, thermography was also used by USDA-APHIS services as a diagnostic aid for detecting cutaneous inflammatory reaction to the horse's limbs. Over time, use of thermography was discontinued and horse inspection for horse shows was again done by physical examination that also included digital palpation.

Since the 1970's to the present day, prosecution of owners and trainers accused of soring horses has been attempted. APHIS had taken a position in the early 1990's that palpation by itself is sufficiently reliable to accurately determine whether a horse has been sored or not. In some cases, horses that were banned from showing were a cause of litigation in federal courts. Recent rulings by Federal Law Judge Peter M. Davenport questioned whether palpation alone was sufficient "scientific" means to allow expressing an expert opinion. (5). He cited a Supreme Court case which set forth four factors to determine that reliability. He used thermography references of published papers in veterinary medicine. Because of his recent ruling, APHIS lost the court case. USDA-APHIS now wishes to reinstitute the use of thermography as an additional means to document if the horse was sored or not.

4. DISCUSSION

The efficacy of non-contact, electronic infrared thermography has been demonstrated in numerous clinical settings and research studies as a diagnostic tool for veterinary medicine. Sometimes it is very difficult to use radiology, ultrasonography, or magnetic resonance imaging for large animals like horses and cattle (bulls). These procedures require direct contact with the animal, and in some cases the animal must be under general anesthesia to perform these tests. Thermography which can be performed in an unsedated animal has been very helpful as a preliminary diagnostic tool in many clinical cases. Painful conditions associated with

peripheral neurovascular and neuromuscular injuries can be easily diagnosed by thermography.

REFERENCES:

1. Nelson HA, Osheim DL. Soring in Tennessee Walking Horses: Detection by thermography. USDA-APHIS, Veterinary Services Laboratories, Ames, Iowa, 1975; 1-14.
2. Purohit RC. History and Research Review of Thermology in Veterinary Medicine at Auburn University. *Thermology International*. 2007; 17, 127-132.
3. Purohit RC, McCoy MD. Thermography in the diagnosis of inflammatory processes in the horse. *Am. J. Vet. Res.* 1980; 41, 1167-1174.
4. Purohit RC. Use of thermography in veterinary medicine. *Rehabilitation Medicine and Thermography*. Edited by Mathew H. Lee, M., and Jeffrey M. Cohen. Pub by Impress Publication 2007; 129-141.
5. Davenport PM. Personal Communication, 2009.

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