

# Dual-Energy Computed Tomography for the Detection of Bone Edema-Like Lesions in the Equine Foot: Standing Horses and Cadaveric Specimens

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## Products

Dual-Energy Computed Tomography (DECT) for detection of bone edema-like lesions (BME) in equine feet.

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## Clinical Background

Bone marrow edema-like lesions (BME) in the equine foot are typically diagnosed with MRI, but DECT may offer a more accessible alternative. Detecting BME is crucial for managing lameness and pathology in equine feet, especially in standing horses.

## Aim of Study

To evaluate the clinical utility of DECT virtual non-calcium (VNCa) imaging for detecting BME in standing horses and cadaveric specimens, and to identify confounding factors affecting diagnostic accuracy (e.g., bone sclerosis, motion, mild BME).

## Cohort Study

19 feet from 18 horses were examined (14 standing, 5 cadaveric). All horses had foot-related lameness or pathology. DECT findings were compared to MRI, the reference standard. Variables included BME location, extent, image quality, and bone density artifacts.

## Results

- **78.9% diagnostic agreement** between DECT VNCa and MRI for detecting BME in equine feet.
- **DECT significantly underestimated BME** extent compared to MRI ( $p = 0.016$ ), particularly in mild cases.
- **Bone sclerosis** was common (73.7%) and could obscure BME, but detection remained feasible in many cases.
- **No significant difference** in image quality or diagnostic accuracy between **standing horses and cadaveric specimens**.
- **Motion and beam-hardening artifacts** impacted DECT quality but did not significantly reduce overall diagnostic confidence.

## Summary

- DECT VNCa is effective for identifying moderate to severe BME in equine feet and is feasible in a standing position.
- Mild BME and areas with bone sclerosis may be missed or underestimated; caution is advised when interpreting DECT VNCa maps under these conditions.
- DECT is a viable alternative to MRI for lameness diagnostics in clinical equine settings, particularly when MRI is unavailable.
- Future studies with larger cohorts are needed to refine diagnostic thresholds and explore quantitative DECT metrics.