November 2026

Literature Review of *T. orientalis* Ikeda in Cattle

Prepared by Sasha Lisowski, DVM, MS

NEW JERSEY DEPARTMENT OF AGRICULTURE

DIVISION OF ANIMAL HEALTH

CONTENTS

Background 2

Key Findings from Existing Literature 2

Treatment and Clinical Management 3

- Current U.S. treatment status 3
- Supportive care 3
- Buparvaquone 3
- Toltrazuril 4
- Oxytetracycline and other medications 4
- Vaccination 4

Herd Management and Biosecurity 5

- For herds with no known Theileria infection 5
- For herds with infected animals or possibly endemic herds 5
- Useful management resources 5

Longhorned Tick Management 6

- Recommended integrated control practices 6
- Vector-management resources 6

NJDA Contact information 7

BACKGROUND

This document is intended to provide a concise review of the available literature regarding treatment and management options for *Theileria orientalis* Ikeda infections in cattle. The scope is limited to therapeutic interventions and management strategies. Detailed information regarding the parasite's biology, epidemiology, and disease pathogenesis is beyond the scope of this review.

Important Note: There are currently no FDA-approved medications available to treat or prevent bovine theileriosis. The causative agent of bovine theileriosis is a protozoan parasite, so utilizing antibiotics in an extra-label or off-label manner will not affect the parasite itself. Withdrawal times for all treatments used must be considered since treated animals are food-producing animals.

The information presented is intended for educational and informational purposes only and does not constitute clinical recommendations or endorsements of specific treatments or products. Clinical decisions should be based on individual animal and herd circumstances and the attending veterinarian's clinical judgement. The findings and interpretations presented do not necessarily reflect the official positions or recommendations of the New Jersey Department of Agriculture.

KEY FINDINGS FROM EXISTING LITERATURE

Several consistent findings emerged from the literature:

- Clinical disease varies considerably. Infections range from asymptomatic carriers to severe anemia, abortions, poor production, and mortality. Disease is particularly concerning in immunologically naïve cattle, calves, and cattle experiencing physiological stress.
- No approved curative treatment or vaccine is available in the United States. Supportive care remains the primary treatment recommendation. Existing research into antiparasitic medications has not demonstrated reliable elimination of infection.
- Persistent infection is important epidemiologically. Cattle that recover can remain PCR-positive for years, potentially for life, and may serve as reservoirs for transmission through competent ticks.
- Both infected and susceptible cattle movements present risks. Introducing infected carriers into an uninfected herd, or naïve animals into an endemic area, can produce new disease.
- Tick control requires multiple approaches. Acaricides, regular animal inspections, vegetation management, and strategic pasture use may reduce exposure, but eliminating Asian longhorned ticks from established environments is difficult.
- International disease patterns may change over time. Australian research suggests that as adult cattle develop immunity following initial exposure, subsequent clinical cases may become more concentrated in calves and newly introduced animals.

TREATMENT AND CLINICAL MANAGEMENT:

CURRENT U.S. TREATMENT STATUS:

- The FDA issued an important update on August 21, 2026, confirming that no FDA-approved medications are currently available to treat or prevent bovine theileriosis.
- The FDA also acknowledges ongoing buparvaquone research and raises concerns about prolonged drug residues in edible cattle tissues. Information available from New Zealand and Australia, where buparvaquone is used, indicate the drug can be found in muscle and liver tissue of cattle for beyond 300 days.
    - Source: "FDA Letter to Stakeholders – Asian Longhorned Tick and Theileriosis (2026)" www.fda.gov/animal-veterinary/product-safety-information/fda-letter-stakeholders-about-asian-longhorned-tick-and-theileriosis

SUPPORTIVE CARE:

Veterinary and international guidance consistently recommends:

- Minimizing handling, transport, and physical exertion in severely anemic cattle.
- Providing readily accessible water, quality nutrition, and shelter.
- Monitoring anemia and other clinical abnormalities through veterinary examination and hematology.
- Considering blood transfusion in selected valuable animals with severe anemia, when clinically appropriate.
- Evaluating and addressing concurrent infections or other causes of illness.
- Excessive handling of severely anemic cattle may precipitate collapse or death.
    - Sources:
        - "University of Missouri Extension – Treatment and Management" - extension.missouri.edu/publications/g2113
        - "NSW Government – Clinical Management of Theileriosis"- www.nsw.gov.au/regional-and-primary-industries/livestock/health-diseases/theileria
        - "Agriculture Victoria – Benign Theileriosis" - agriculture.vic.gov.au/biosecurity/animal-diseases/cattle-diseases/benign-theileriosis-in-victoria

BUPARVAQUONE:

- A 2024 USDA-ARS/WSU study evaluated buparvaquone in subclinically infected cattle carrying the U.S. Ikeda isolate. The medication temporarily suppressed detectable parasitemia, but infection subsequently reappeared. The results did not support reliable parasite elimination.
- International experience has also documented clinical improvement without necessarily clearing persistent infections.
- Buparvaquone is not FDA-approved for cattle in the United States. The FDA's 2026 assessment identifies evidence of tissue residues persisting beyond 300 days in some circumstances.
    - Source: "Bastos et al. (2024) – Transient Efficacy of Buparvaquone" - pubmed.ncbi.nlm.nih.gov/39132441/

TOLTRAZURIL:

- A 2025 Australian randomized study evaluated toltrazuril administered to calves during experimental tick-mediated infection. Treatment did not prevent infection or produce consistent improvements in parasitemia, PCV, or bodyweight.
    - Source: “de Burgh and Emery (2025) – Toltrazuril Prevention Study” - pubmed.ncbi.nlm.nih.gov/39791129/

OXYTETRACYCLINE AND OTHER MEDICATIONS:

- Oxytetracycline, imidocarb, and other medications have been investigated or reported in clinical settings, with inconsistent outcomes.
- Because *Theileria* is a protozoan parasite, antibiotics should not be assumed to eliminate infection. They may have a role when treating documented or suspected concurrent bacterial disease.
- A 2025 Georgia case report documented clinical improvement following treatment involving ceftiofur and imidocarb, but the cattle remained infected months afterward. This illustrates the difference between clinical recovery and parasitological cure.
    - Source: “Maboni et al. (2025) – First Clinical Report in Georgia” - pubmed.ncbi.nlm.nih.gov/40518242/

VACCINATION:

- In July 2026, Medgene announced the first commercially available U.S. vaccine targeting *Theileria orientalis* Ikeda in cattle.
- The recombinant vaccine is administered as two-dose series approximately four weeks apart and requires a veterinary prescription.
- It is authorized under the USDA’s prescription platform biologics regulatory pathway, which does not require demonstration of efficacy for each new antigen formulation.
- Protective efficacy, including reduction of clinical disease, parasitemia, or persistent infection have not been established.
- Vaccination may serve as an adjunct to existing tick control, biosecurity, and herd management strategies rather than a replacement for these measures.
    - Source: Medgene (2026). “Theileria Vaccine for Cattle Producers” - medgenelabs.com/theileria
    - Source: Washington State University Veterinary Medicine Extension (2026). “Emerging Threats at the Borders” - vetextension.wsu.edu/2026/10/30/emerging-threats-at-the-borders/

Conclusion: Current evidence supports clinical stabilization and supportive care. The use of antibiotics in infected animals may show clinical improvement due to treating a concurrent bacterial disease. As T. orientalis Ikeda is a parasite, antibiotics do not work on the parasite itself. Therapeutic decisions must also account for all food animal drug regulations and withdrawal times.

HERD MANAGEMENT AND BIOSECURITY:

The most applicable recommendations involve understanding herd infection status, reducing tick exposure, and carefully managing cattle introductions.

FOR HERDS WITH NO KNOWN THEILERIA INFECTION:

- Consider genotype-specific PCR testing before purchasing or introducing cattle to the herd.
- Evaluate tick exposure associated with purchased animals and their source premises.
- Inspect and monitor newly introduced animals for changes in health after introduction.
- Avoid reusing needles to prevent blood contamination.
    - Consider risks of using multi-dose vaccine vials where the needle is reused for multiple animals.
    - Also consider ear taggers and other instruments that come into contact with multiple animals. Disinfect between animals to prevent blood contamination.
- Maintain a year-round awareness of tick risk, with intensified precautions from March through November, when ticks are active in New Jersey.

FOR HERDS WITH INFECTED ANIMALS OR POSSIBLY ENDEMIC HERDS:

- Develop a herd-specific management plan with the herd veterinarian.
- Prioritize monitoring clinically susceptible groups, including calves, recently introduced cattle, pregnant animals, and cows around calving.
- Avoid unnecessary stress in clinically affected animals.
- Maintain nutrition, parasite control, and routine preventive care.
- Keep records of reproductive performance, illness, mortalities, cattle introductions, and tick-control practices. This information is useful for the herd veterinarian.
- Discuss movement-related risks before introducing susceptible replacements or breeding stock.

USEFUL MANAGEMENT RESOURCES:

- “Penn State Extension / Pennsylvania Department of Agriculture – Theileria Herd Movement Guidance” - extension.psu.edu/asian-longhorned-tick-and-theileria-orientalis-a-growing-risk-for-pa-cattle
    - Particularly helpful handout because it distinguishes the risks of moving infected cattle into negative herds versus introducing negative cattle into infected environments.
- “Virginia Cooperative Extension – Asian Longhorned Tick and T. orientalis Ikeda: Current Thoughts and Understandings” - www.pubs.ext.vt.edu/APSC/apsc-196/apsc-196.html
    - Provides practical discussion of transmission, herd infection trends, and management.
- “DairyNZ – Theileria Management” - www.dairynz.co.nz/animal/animal-health/theileria/
    - Describes animal introductions, monitoring during calving, tick prevention, and herd-level management.
- “University of Missouri Extension – Theileria orientalis: An Emerging Cattle Disease” - extension.missouri.edu/publications/g2113
    - Updated October 2026; useful for both veterinarian and producer education.

LONGHORNED TICK MANAGEMENT:

The primary confirmed vector of *T. orientalis* Ikeda in the U.S. is *Haemaphysalis longicornis*, the longhorned tick.

Several characteristics of this tick complicate management:

- U.S. populations reproduce primarily through parthenogenesis.
- Larvae, nymphs, and adults may infest the same animals.
- Much of the tick's life cycle occurs in the environment rather than on cattle.
- Wildlife and other animals can maintain tick populations in areas without cattle.
- Animal treatments may reduce tick numbers without completely preventing transmission.

RECOMMENDED INTEGRATED CONTROL PRACTICES:

- Regularly inspect cattle, paying particular attention to the ears, neck, axillae, groin, tailhead, and udder region.
- Develop a veterinarian-directed acaricide program appropriate to the herd.
- Consider combinations of appropriately labeled ear tags, pour-ons, backrubbers, and siderubbers when warranted.
- Rotate pesticide classes appropriately to limit selection for resistance.
- Maintain short vegetation around high-use livestock areas and reduce overgrown brush.
- Reduce cattle access to heavily infested woodland margins or pasture areas where practical.
- Identify ticks professionally rather than assuming every tick infestation involves longhorned ticks.
- Consider applying appropriate acaricide treatments to barn cats and domestic dogs on the farm to prevent ticks being spread from companion animals to cattle.

Product choices must be based on current EPA/FDA labeling as applicable, animal class, dairy or beef production, retreatment intervals, and meat or milk withdrawal requirements. Effectiveness against other tick species does not automatically demonstrate equivalent protection against longhorned ticks.

VECTOR-MANAGEMENT RESOURCES:

- "Virginia Tech – Managing the Asian Longhorned Tick: Best Management Practices Checklist"- spes.vt.edu/content/pubs_ext_vt_edu/en/ENTO/ENTO-382/ENTO-382.html
    - A strong practical resources for producer education.
- "USDA APHIS – Asian Longhorned Tick Information and Federal Updates" - direct.aphis.usda.gov/livestock-poultry-disease/cattle/ticks/asian-longhorned
- "Rutgers Center for Vector Biology – Asian Longhorned Tick Identification" - ticks.rutgers.edu/ticks/8
- "University of Arkansas – Asian Longhorned Tick and Theileriosis Surveillance" - www.uaex.uada.edu/farm-ranch/pest-management/insect/animal-insect-management/asian-longhorned-tick.aspx

NJDA CONTACT INFORMATION

For questions regarding livestock health in New Jersey, contact NJDA Division of Animal Health at:

- Phone: 609-671-6400
- Email: State.veterinarian@ag.nj.gov
- Website: www.nj.gov/agriculture/divisions/ah/

For laboratory testing, including *Theileria orientalis* Ikeda testing, contact the Animal Health Diagnostic Lab at:

- Phone: 609-406-6999
- Email: jerseyvetlab@ag.nj.gov
- Website: www.nj.gov/agriculture/ahdl/contact/