



### Check your Crevices: Ticks and Tickborne Disease in KY



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### Ticks are a priority issue for the entomology department at UK



We have been receiving lots of inquiries on ticks and the issues they present for people and animals

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### Ticks and tick-borne diseases are of high interest for the general public



Fueled by Lyme disease, invasive species such as longhorned ticks, and the Alpha-gal red meat allergy

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### In Kentucky ticks are a threat to equine and cattle industries



Kentucky has the largest cattle industry east of the Mississippi River and is the premiere equine state

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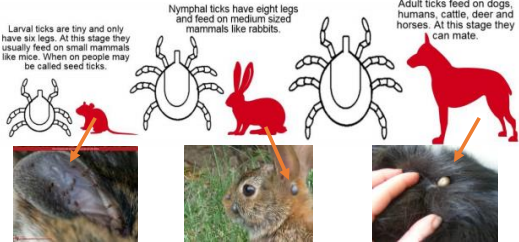
### Eco-tourism, hunters/fishers, and outdoor workers must all contend with these pests as well



Understanding which species are located in which counties and keeping an eye out for the invasive longhorned tick will be priority goals

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### Ticks are host specific ectoparasites of many different organisms, but some will readily feed on humans



Larval ticks are tiny and only have six legs. At this stage they usually feed on small mammals like mice. When on people they may be called seed ticks.

Nymphal ticks have eight legs and feed on medium sized mammals like rabbits.

Adult ticks feed on dogs, humans, cattle, deer and horses. At this stage they can mate.

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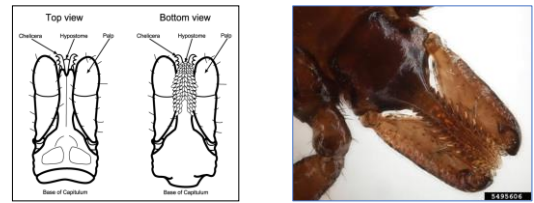
**Ticks are “hematophages” they survive by digesting blood from their hosts**




Ticks can wait years long lean periods before succumbing to starvation

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**Ticks use a rigid, saw-like mouthpart with backward spines, to penetrate the skin**



They “cement” into place and can remain attached for 7 to 10 days if undisturbed

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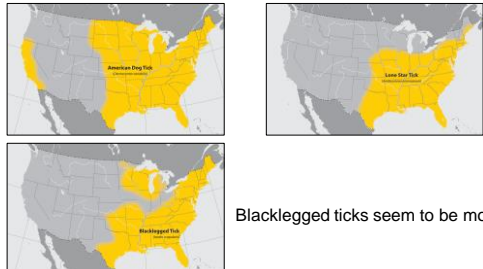
**Kentucky has 3 primary tick species, which can impact human health**



- Blacklegged tick: AKA Deer ticks
- Lone star tick: AKA turkey ticks or turkey mites
- American dog tick: AKA wood ticks

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**These 3 species are established in KY**

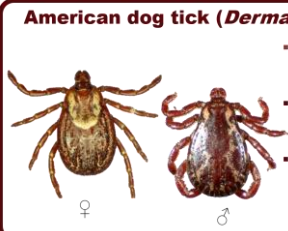


Blacklegged ticks seem to be moving in!

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**American dog ticks are among the most encountered tick species**

**American dog tick (*Dermacentor variabilis*)**



- Live in grassy areas and along paths/trails
- Adults active April-August
- Can transmit Rocky Mountain Spotted Fever and Tularemia

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**American dog ticks have short mouthparts and an ornate scutum, more tear-dropped shaped**



Adult females have a cream-colored collar which males lack

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American dog ticks are found in areas with little or no tree cover like grassy fields, along roads, walkways and trails



Ticks will "quest" on vegetation with front legs extended at host-height

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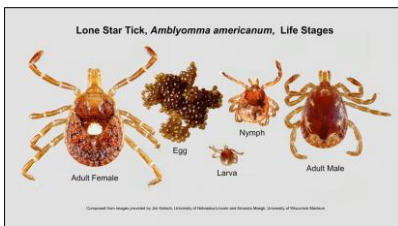
Lone star ticks are also common and are more aggressive than American dog ticks

**Lone star tick (*Amblyomma americanum*)**

- More commonly found in/near wooded areas
- Adults active April-August
- Transmits Ehrlichiosis, Rocky Mountain Spotted Fever, Heartland virus, STARI, and red meat allergy

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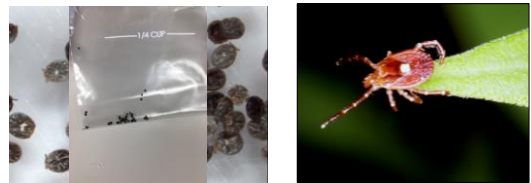
Lone star ticks have long mouthparts, rounder bodies



Adult female has a single white spot on her scutum

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Lone star ticks are found in woodland areas with dense undergrowth



Will quest or actively hunt, can end up with dozens on you at a time

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Blacklegged ticks are greatly feared for their association with Lyme disease

**Blacklegged tick (*Ixodes scapularis*)**

- Feed mainly on white tail deer and live in forests
- Adults active October-May on any day above freezing
- Transmit Lyme disease, Anaplasmosis, Babesiosis, and Powassan virus

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Un-fed adult females are easier to identify due to their red-orange coloration

TickEncounter Resource Center *Ixodes scapularis* (Blacklegged ticks or Deer ticks)

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**Blacklegged ticks are found in areas where their preferred host, white tail deer, are found**



Adults can be active any day above freezing and are found questing about knee-high on the tips of branches of low growing shrubs

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**Kentucky has seen an increase in confirmed locations of black-legged ticks**



We believe these are a northern variant, which means that they stay above leaf litter and encounter humans more often

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**There is a new tick on the block though: Asian longhorn tick**



An invasive species from Eastern Asia that was accidentally introduced before 2015

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**Started in New Jersey and has been slowly moving since 2015 (4 Kentucky reports)**



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**This is an astonishing tick because so far it only reproduces asexually**



Sort of like aphids, one female can produce hundreds of offspring very quickly

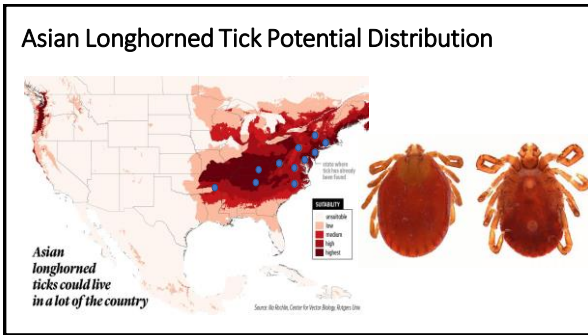
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**Thus far, no disease transmission has been reported with this species in the US**



It has been confirmed on at least 2 people, larger issue is exsanguination of livestock

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### Because of their feeding habits, ticks are potent vectors for disease causing agents

- Anaplasmosis
- Babesiosis
- Borrelia mayonii*
- Borrelia miyamotoi*
- Bourbon virus
- Colorado tick fever
- Ehrlichiosis
- Heartland virus
- Lyme borreliosis (Lyme disease)
- Powassan disease
- Rickettsia parkeri* rickettsiosis
- Rocky Mountain spotted fever
- STARI (Southern tick-associated rash illness)
- Tickborne relapsing fever (TBRF)
- Tularemia
- Red-meat allergy
- 364D rickettsiosis

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### These are the verified tick-borne illnesses of KY: 80% of arthropod vectored disease in KY is from ticks

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Antibiotics can treat these, except for red meat allergy

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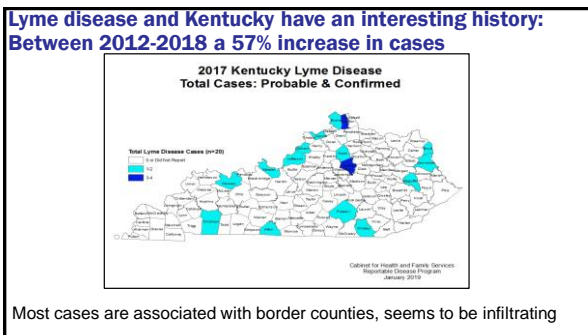
### Lyme disease is spread by blacklegged ticks/caused by *Borrelia burgdorferi*

Common Symptoms

- High fever
- Erythema migrans rash
- Fatigue & stiffness

Tick must feed for a minimum feeding time of ~36 hours

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### Rocky Mountain Spotted Fever spread by American Dog tick/caused by *Rickettsia rickettsii* bacteria

Common Symptoms

- Red spotted rash on palms and soles of feet
- High fever
- Body aches

**290% increase in KY cases 2012-2018**

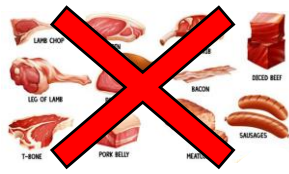
Tick must feed for a minimum feeding time of 4-10 hours

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### Red meat allergy is transmitted by lone star ticks and caused by sugar molecule Alpha-gal

Common Symptoms

- Allergic reactions to ingesting red meat
- Reactions occur several hours after ingesting meat (4-6 hrs)



If the tick is carrying the Alpha-gal sugar molecule, can be transmitted to you nearly instantly

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### Ticks can be active year-round, but high tick season in Kentucky is May/June



Lone Star Tick nymph attached to wrist



Tick toc it's tick time!

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### Use simple measures of protection: wear light colored clothing, wear sleeves and pants, tuck pants into socks,




Perform regular tick checks on humans & pets (treat your animals for ticks!)

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### Skin applied insect repellents can help keep you safe from tick bites



	Coleman Botanicals Repellent	Coleman SkinSmart Repellent	Coleman 100 Max DEET	Coleman 40% DEET	Sawyer Picaridin
Active Ingredient	Oil of Lemon Eucalyptus	IR3535	DEET (98.11%)	DEET (40%)	Picaridin 20%
Protection	6 Hours	8 Hours	10 Hours	6+ Hours	8.5 hours

DEET is a standby (the higher the percentage the longer it lasts), some people prefer other types like picaridin, etc.

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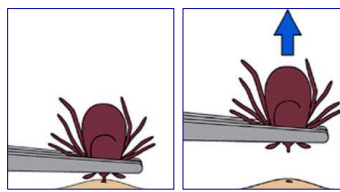
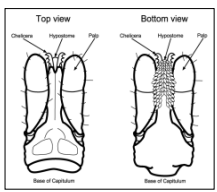
### Permethrin is great for tick bite prevention, should only be applied to clothes or gear



Do not apply to the skin directly, this is an insecticide rather than a repellent; you will find dead ticks stuck on your clothes

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### Remove embedded ticks ASAP with pointy tweezers

Grasp the tick close to skin's surface and pull straight out, **do not** use fire, alcohol, essential oils, etc. to kill the tick first

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**Current work: KY Veterinarian Tick Submission Program**



- Started in 2018 with KY Fish & Wildlife
- UK partnership in 2019
- Primary goal: identify *Ixodes scapularis* populations in every county in Kentucky
- Secondary goals:
  - Identify other species of tick
  - Test for pathogens
  - Asian longhorned tick



Anna Pasternak

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**Collected specimens will be tested for disease causing agents**



Distribution maps will be brought up to date and Asian longhorned tick will be monitored for as well

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**If you think you or your groups would be interested in hearing more, please provide contact info**



We are planning to roll out tick education efforts across the state

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**Questions and Contact Info**



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Let me know if I can help in any way!

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