

# Tick Talk\_ How Researchers Are... to Understand Tick Prevention

Tue, Dec 05, 2023 1:45PM 30:09

## SUMMARY KEYWORDS

ticks, people, xian, tweets, risk, research, cheng, prevention, search, concern, center, hunting, education, information, conversations, understanding, happening, tick bites, area, engage

## SPEAKERS

Phillip Stokes, Ricky Telg, Lauri Baker, Karlibeth Leitheiser, Cheng-Xian Yang

---

**P** Phillip Stokes 00:00

Hello and welcome to Science by the Slice. My name is Phillip Stokes, Education Coordinator with the PIE Center. And today, I'm joined by Karlibeth Leitheiser, really happy to have her here because she's leading today's episode and conversation with our researchers. So first off currently, Karlibeth, thanks so much for being here.

**K** Karlibeth Leitheiser 00:18

Hi, thank you, Phillip for having me. I'm really excited to share this podcast with everyone. So as you said, my name is Karlibeth Leitheiser, and I am a Master's student over at the Department of Agricultural Education and Communication at the University of Florida. I've also worked with the PIE Center for the past two years as support staff with their education initiatives. And I'm leading today's podcast on ticks with some of our researchers here at the PIE Center.

**P** Phillip Stokes 00:43

Okay, so you just mentioned it. You're leading the conversation on ticks, and some of the research that has been done by the PIE Center. But before we get into that, did you know much about ticks before this conversation? Or what did you know what was your experience with ticks?

**K** Karlibeth Leitheiser 00:56

Right. So before kind of conversing with these researchers, my one core memory associated with ticks was when I went to Girl Scout camp when I was probably about eight or nine years old. I went to a day camp all day long, where I was out in the woods doing obstacle courses and

climbing and things like that. And I had come home, my parents picked me up and I was there and I saw I had a tick on my stomach. And that is horrifying to any eight or nine year old who is afraid of bugs or has never seen a tick. This bug is stuck to my skin and will not come off. And I learned that day that my parents had also never really encountered ticks before. Because my mom immediately tried to pluck it off of me like it was a flea or any other bug. And if you know how ticks attached to you, you know that that is not a very effective method of removal. So the tick was still stuck on me. So my dad, you know, Googled different ways to get it off. And the best way seemed like to take a burnt blowout match to the tick to have the heat kind of wean it off. That did not work, the blown out match did not. So he had the bright idea to use a lit match, which did get the tick off but left me with one little tiny burn mark that I was not very happy about and overall not a good experience for me as a child going through it. And I still think back to it.

P

Phillip Stokes 02:24

You know and Karlabeth, I think your story is probably relatable to a lot of people listening because there's so much information about you know what to do in situations like this. And sometimes we don't exactly know, which is right where we heard the information, which is credible. And so today, we're gonna get to some of that specifically about some of the search behavior and what people are really looking at and looking for on the web. Right?

K

Karlabeth Leitheiser 02:52

Right. So today we will be talking with Dr. Lauri Baker and Cheng-Xian Yang. Both are here over at the PIE Center. And they will share their research they've been working on they've been working on it grant with a couple different studies, but they talk more about that in detail in the actual podcast.

P

Phillip Stokes 03:09

Well thank you so much, Karlabeth. We'll start the episode.

R

Ricky Telg 03:17

This is Science by the Slice, a podcast from the University of Florida's Institute of Food and Agricultural Sciences Center for Public Issues Education. In this podcast, experts discuss the science of issues affecting our daily lives, reveal the motivations behind the decisions people make, and ultimately provide insight to solutions for our lives.

P

Phillip Stokes 03:43

Hey, everyone, it's Phillip again. We're gonna jump right into the conversation where Karlabeth is asking Dr. Lauri Baker about her previous experience with ticks prior to doing this research

K

Karlibeth Leitheiser 03:54

Anyway, did you ever think that you would be working with ticks or working with tick information?

L

Lauri Baker 03:58

No, I would say if I had to select a favorite animal when I was a child, it probably wasn't a tick. I did pick a fair amount of ticks off of my boys when they were little mostly in Kansas, though I don't think I've pulled a single tick off of them since we've moved to Florida. But I would take the ticks off of them and save them in the freezer. Because if anything ever happened, and they had something I wanted to be able to take it to the doctor and identify the tick. And so then when we moved to Florida, and I cleaned out my freezer, I had a ridiculous amount of ticks labeled by the day and the child that I pulled them off of.

K

Karlibeth Leitheiser 04:36

Right and then some people might not even think about that, like, oh, I should save the ticks.

L

Lauri Baker 04:41

Right. I'm not even sure how I knew to do that. Except maybe our doctor or pediatrician told us at one point in time to save them. But yeah, it's really delightful along your frozen vegetables and chicken nuggets a side of ticks.

K

Karlibeth Leitheiser 04:55

Right and so since we're talking about your work with ticks or tick research, could you tell me a little bit about your current position and your role in research and what grant projects you're working on?

L

Lauri Baker 05:06

Yeah, absolutely. I am currently an associate professor in Agricultural Education and Communication. And I have a 65% research appointment and 35% Extension appointment. And essentially, the work that I do both for research and extension is within the PIE Center. So it fits in nicely with the things that are happening on this podcast. And we often get an opportunity to study really unique topics and dig in deeply on a variety of agricultural issues and Natural Resources issues. And so the project that we're talking about today specifically, is a collaboration with the Southeastern Center for Vector-Borne Disease, which is a CDC funded Center. And the leads on this project are epidemiologists and entomologists. And they work heavily in this area in understanding ticks and public health concerns around those. And we are simply the social science side of that. So we're understanding the aspects related to human behavior, involving ticks and knowledge and understanding in multiple spaces so that the public can be better prepared and understand the health issues involving ticks.

K

**Karlibeth Leitheiser 06:23**

Right, and so you kind of brushed on it. But so what's the issue here? Why should people or our listeners be concerned about ticks?

L

**Lauri Baker 06:33**

I think ticks are something that we all kind of know are a problem. I think anyone that has a small animal and takes them to the vet, they regularly are receiving some form of education about why ticks are a problem for your animal. Maybe you're on a monthly treatment plan or things like that. But sometimes we don't think about protecting ourselves. And right now, particularly in the southeastern United States, a lot of new tick varieties have come to the area that that we hadn't seen in recent years. And so those can have a variety of challenges for people healthwise, that can get tick diseases from these. Two that we're kind of highlighting right now and paying attention to our the lone star tick. And the lone star tick is particularly of concern for many of our ag families out there, because we tend to be red meat eaters, not everybody. But there are certainly a lot of us that that enjoy eating red meat. And maybe also engage in activities where ticks are present working outside hunting, those kinds of activities or enjoying the natural resources. And so the lone star tick in particular has been connected to Alpha-gal syndrome, which is an allergy to red meat. And so I think for many of us, that would ruin a lot of traditions in our family and things that we typically think of gathering around and doing together having, you know, a barbecue, and those types of activities. So that can really affect people's lives and certainly affects people's health in other ways. The other one that we're really concerned for agricultural producers is the Asian Longhorned tick. And that tick is concerning for more for animals than for humans. And so it can bite humans, but there aren't as many challenges associated with it. But cats and dogs, and really cattle in particularly calves, we have a lot of concern for them. There have been cases where entire herds of cattle have been wiped out by this tick. And so it's something we want to make sure people are aware of and planning for and treating their fields and their pastures, as well as paying attention to the ticks that might be spread by their small animals are by themselves.

K

**Karlibeth Leitheiser 08:56**

Right. So it sounds like ticks are definitely a pressing issue, whether you're a homeowner or producer or just outside a lot. Some people have that belief that ticks are only a problem for certain parts of the year, maybe in the summer months, or even for certain parts of the United States. Maybe it's more out west. Could you talk a little bit more about how this might be a year round issue?

L

**Lauri Baker 09:18**

Absolutely. And I think it is important that you bring up these ideas of myths around this area, because that's part of what we like to look at at the PIE Center right are these public perceptions and often perception can become reality. So we aren't really sure where we heard it. But over time, maybe we develop a belief that in the winter, I can hang out all the time that I want and I'm not going to get a bite from a tick or or from any other insect and unfortunately,

that's not really true. While tick bites and tick diseases are more prevalent in the summer months, it's still possible to be bitten by a tick during the cooler months and in fact the CDC tells us that anytime the temperature's above freezing, there's a possibility for getting a tick bite. And some of these ticks in particular can bite in all different stages. So again, some of those public perceptions may be like, well, a tick larva is not really going to bite me, well, that's not necessarily true. Some of these can bite in all of their life cycles.

K

Karlibeth Leitheiser 10:20

And so now that we have a little bit of background information on what ticks are, what the concern is, could you talk more about these studies you have carried out about ticks?

L

Lauri Baker 10:30

Absolutely, I'd be happy to we are, again, really focused on that public perception and understanding around ticks. And so one of the ways we've approached this research is through the health belief model. And within that model, it really talks about people aren't going to make a decision related to their health, if they don't believe it's a problem. And so the more we can kind of understand what risks people see both for themselves and for their animals, and for their livelihoods and their families, the more that they believe those things are a problem, the more they're going to be willing to take action to preventing problems associated with it. So one of the very first things that we did on this project was to look at what kind of online messages were being shared about ticks and tick diseases and risks around those, as well as what types of behaviors people had and what they were searching for, on an online environment. And Cheng-Xian Yang has been really crucial to this effort and it has been a part of his graduate work that he's focused on identifying some of these issues with us, both looking at searches in Google Trends, as well as tweets on Twitter, or now as we call it, X. And so I would like for him to share a little bit about that research and what we found.

C

Cheng-Xian Yang 11:54

Hi, I'm Cheng-Xian. And I am a research assistant working with Dr. Baker, and we work on some tick risk communication research, and one of them is focusing on Google Trends. And it is like use Google Trends to search for the tick risk communication research and analyzing online search behavior related to tick-borne diseases. So Google Trends is a free online search tool that allows users to see how frequently a search term or topic has been searched for on Google during a specific time and area. So we observed the correlations to of specific search terms between some outdoor activities and ticks. By doing so we can predict potential tick borne disease risks through online health information seeking behavior. So to be more specific, it is like when a positive correlation exist between the two terms in may reflect that people are more likely to be exposed to tick borne diseases when they engage in that kind of outdoor activities. So based on the analysis of the different regions, states with higher searches for like the corn maze, are correlated with increased searches for meat allergy. Also, states with more searches for hunting can show a higher frequency of searches for the ticks. So if we look from the another aspect, from the time-based analysis, we can discover that a significant correlation between the terms like U-Pick, park, and hiking with the high with tick-related risks such as

ticks, tick bites, and Lyme disease. So this suggests that engaging in these outdoor activities in the US during tick seasons may increase the risk of tick bites, emphasizing the need for tick repellents.

K

Karlibeth Leitheiser 14:00

Thank you, Cheng-Xian, that was really interesting to hear how you know that social media presence can kind of tell us what the habits of regular people are with ticks. So thank you for that. Dr. Baker, did you have any comments about that research or the findings?

L

Lauri Baker 14:15

Yeah, I think it's been really interesting for us to see that those trends of when we think about tick bites are also what we're seeing in the data on people's searches. So one thing that we can say as Cheng-Xian kind of highlighted is that there is this connection that people are likely searching for that red meat allergy during those seasons, where maybe they have experienced a tick bite or starting to have some symptoms and are wondering what's happening. And so those trending upward during certain times certainly aligns with what we're seeing, as far as reports in those areas. The other aspect that that's interesting is sometimes what we didn't necessarily find as much of and so, people there were high correlations with the U-Picks and the parks, but there weren't as significant correlations with corn mazes. And so those types of things may offer an opportunity for agricultural organizations, agritourism efforts to do a better job of having signage, having repellents available, or commuting, communicating with people online ahead of time to be prepared. We don't want to make people overly scared. But we also want to make sure that we are doing our part to prepare people that might be visiting our property or might be experiencing these issues. We also kind of saw hunting wasn't as prominent, which not all agricultural producers are hunters, but a lot of them are. So that's another opportunity for education in that space, particularly people that are deer hunters. Ticks really enjoy deer. And so people that are preparing for those activities. Again, the Google searches are not, you know, standalone information, they may be getting information elsewhere, maybe they aren't searching for that information, because they already know that information. But it helps give us a picture of what's happening as far as public perceptions around the correlation of those activities and those associated diseases.

C

Cheng-Xian Yang 16:17

For another interesting finding is that we discover on negative correlations between the word hunting and some tick risk terms. And it is not surprise because it usually for the white-tailed deer, which is primary hunting target in North America, are most actively hunted from September to January, which is not the tick-borne season. However, during the October and November, these are the time that the adult blacklegged ticks are most active. And these ticks are important carriers of Lyme disease germs and can infect white-tailed deers. So we infer that maybe the hunters may not be fully aware of this seasonal tick actively and may assume that ticks are active only during the summer. So this emphasizes that the importance of targeted risk communication efforts for hunters to ensure that they receive accurate information and take necessary precautions against tick-related risks. One of the other pieces of this project that we've been doing during the first year, was also understanding what kind of

social media conversations were going on not just searches for this kind of information. And so Cheng-Xian again, took a really active role in this aspect of understanding what kinds of conversations were happening and what kinds of risk messages were happening on Twitter. So I'm gonna pass it to him and let him explain a little bit more about what we found in that research and why it's important. Okay, for the Twitter research, we focus on analyzing the Twitter, the content about a tick-borne diseases and the prevention. So we also want to know what kind of information on the social media will have a higher engagement rate. So in our result, we discovered that on Twitter, like the tweets talk about a tick-related issues, there are more than half of them is without a visual information, such as the pictures or some graphs, graphics, however, we discovered that if a tweets that is with the visual information will significantly have higher engagement rates than those without the visual information. So this result can support that tweets with visual aids tend to have a higher public engagement rates, making scientific information more accessible and encouraging interaction to risks on social media. So people are more willing to reply or retweet these kinds of information. On the other hand, another interesting thing is the tweets with URL will usually have lower engagement rate than those without the URLs. So the URLs can really provide additional sources and extended knowledge. But the communicators should still consider to provide enough information in the tweet itself, instead of only rely on the external links, because not all the people will really click into that URLs.

L

Lauri Baker 19:36

Yeah, thanks, Cheng-Xian. I think that's a really important finding for science communicators that may be listening is that not only do we need to have that visual aspect, which I think is something we've heard over and over again. I feel like there's a tendency, perhaps maybe more from faculty than from full time communicators to say, well, I already have this in a fact sheet. So I'll just tweet out this URL and it has all the information. Well, what we've seen in this research is people then aren't clicking on that information, they're not engaging with that content the same way they would if the information was included within the tweet with a visual, more engaging, I think an opportunity exists for us to create better visuals and better tweets. And perhaps in a reply, we can include the fact sheet as a URL for those who really do want to dig deeper and engage with that content. But if we're really trying to reach more people, and not just repeat a URL, that we've probably shared other places and can be found other places, we really have to do a better job of creating messages that resonate with people and images that resonate with people, even though it might require a little bit more work than sharing a URL.

K

Karlibeth Leitheiser 20:50

Thank you. I think that's a very valuable piece of information to take away from this, especially for our science communicators out there. And so you talked a lot about when people are tweeting about ticks, what they're tweeting about ticks, what's a key takeaway that you learned from the online engagement either for tick prevention or tick current public perception?

L

Lauri Baker 21:11

Well, one of the things we really looked at were the different types of messages that were being used and how they were being framed. And so while we looked at that, we also looked at

who was doing the tweeting, and what we often find in these situations is it's the same people that are sharing that information. And they often are government organizations, organizations that are really passionate about this area, or this aspect. But I think there's a real opportunity to engage some of those perhaps micro influencers in this area, perhaps people that have their own agritourism operations, or mom bloggers or dad bloggers, who are taking their children to these types of events or who are hunting with their families. So I think there's an opportunity to expand this messaging, once again, it's over a one year period, it's in a small timeframe, but we can really learn how to change some of the trajectory and the conversations and make this something that people think about before they engage in these types of activities.

K

Karlibeth Leitheiser 22:17

Right. And so you did a really great job explaining your previous studies, and that kind of looked at what information is already out there. Do you have any current or ongoing or future studies about this research that you plan on doing in the future?

L

Lauri Baker 22:31

Yes, absolutely. Now that we have kind of gotten the landscape, if you will, of what's happening online related to tick search behavior, and related to conversations around ticks and tick diseases, we're moving into the survey phase where we really want to understand directly from our agriculture and natural resources audiences first, if what they know about ticks, particularly these two ticks, the lone star tick and the Asian Longhorn tick. So we're gathering people's perceptions about their knowledge related to ticks, their knowledge related to prevention behaviors, and we would hope that some of our listeners might be willing to participate in some of those surveys that are happening this semester, and maybe early next into 2024, as well. And if they have more questions about this project, they can go to our PIE Center website, and it simply [piecenter.com/ticktalk](http://piecenter.com/ticktalk), and they can find out how to take one of those surveys, if they can just give us 10 minutes of their time, we'd love to hear from them. And then the next phase of that is we're going to start looking at other audiences. So one of the things that we've learned in our COVID research and other research projects is when it comes to health and diseases, people often trust medical professionals as they should. We are not medical professionals. We're not epidemiologist, we're not entomologists. So we want to point them to those people. But we also want to find out what those people know. And so, in 2024, we're moving on to look at health care professionals and their knowledge of ticks and tick diseases, particularly these ticks that are just starting to come to the southeastern United States so we can get a clearer perspective on that. And then long term, we'll be moving this into educational assets around these topics so that we can do a better job of helping people understand the importance of tick prevention and education and have resources to share in those conversations.

K

Karlibeth Leitheiser 24:36

What is the takeaway from all of this put together? What is your end goal from all of this research?



L

Lauri Baker 24:42

That's a fabulous question. I think one of the reasons the CDC funded some of this work was because they also see a need for public engagement on these topics. And the more that the PIE Center can get involved in these kinds of efforts and understand public opinion and public understanding around not just ticks and tick diseases, but how people understand and believe about their health and the consequences that they have that they can take control of and empower people to make changes around tick prevention, in this case, or any of the other topics that we talk about, I think is really the big so-what piece of why we do this work.

C

Cheng-Xian Yang 25:25

I think the big takeaway is find better strategies for risk communication or risk communicators. So for example, for the Google Trends, research, we would like to, I mean, this is a cool experience for me, at least, because we use the big data to study health search behavior, and the offer prevention suggestions. So for example, by partnering with Health organizations, it can be our future step to recommendations, maybe we can consider to collaborate with some health organizations, such as when people in tick-borne areas search for outdoor activities, like corn maze, or hunting, we can use Google ads to alert them about tick borne disease risks, and educate them on prevention, such as remind them to prepare the tick repel them with them, when they engage in these kind of outdoor activities. Or also, we could collaborate with some U-Pick farms or corn mazes, to spread the prevention messages on their websites to reduce the risk associated with these activities.

K

Karlabeth Leitheiser 26:40

Right, I never really thought about that point of using advertisements for health education. I kind of think back to COVID, when there was wear your mask signs everywhere, or, you know, vaccination advertisements. But I think it's also very applicable to other health issues, like ticks and tick borne diseases. So that's a really great takeaway.

L

Lauri Baker 26:58

And I think we are moving into a society where public opinion is driving a lot of industries. So I think health industry is similar in that way is, sometimes we see crisis and risk breakout in an online environment or pop up in something really unique and a Reddit thread, right, and then it moves to more mainstream. So I do think that that's one aspect that we've been able to bring to the project that's a little unique is looking not just at how many infections have been reported, how many doctors are identifying these issues, but how much is the public curious about these issues? And that certainly speaks to how much concern they have around those. And while we can't make direct correlations between infection rates and Google searches, we can certainly do some thinking in that process. And I think that's part of why I think we're really proud to be involved in this work. And we're grateful that the epidemiologists in particular have seen the value that the social science work can bring to this because they certainly measure things in a different way. Okay, well, we have this many infections, we maybe are actually going out in the field. And people in other parts of this project are going out into fields and dragging for ticks to see what the tick populations look like during different months. And we have that data. But again, that doesn't really show how much it's impacting people. And so I

love to see that much of the work from the CDC. And we've seen this in USDA projects and other projects is integrating that social science question of, well, what do people think and what are they concerned about? Because sometimes that can actually be more important than the actual infection rates, until they get to a point where it's really drastic. So I feel like that's the place where we can combine public education to step in and alleviate some of those concerns before they even become major concerns.

**K** Karlibeth Leitheiser 29:05

Well, thank you so much, Dr. Baker, and Cheng-Xian for joining us today and sharing your research and knowledge on this topic with everyone listening out there.

**L** Lauri Baker 29:13

Thank you, I appreciate being here. It's been fun.

**C** Cheng-Xian Yang 29:15

Thank you.

**R** Ricky Telg 29:18

Science by the Slice is produced by the UF/IFAS Center for Public Issues Education in Agriculture and Natural Resources. Thanks for listening to today's episode. Subscribe to Science by the Slice on your favorite podcast app and give us a rating or review as well. Have a question or comment? Send us an email to [piecenter@ifas.ufl.edu](mailto:piecenter@ifas.ufl.edu). That's piecenter, all one word, at ifas, I-F-A-S, dot ufl dot edu. We'd love to hear from you. If you enjoyed today's episode, consider sharing with a friend or colleague. Until next time, thanks for listening to Science by the Slice.