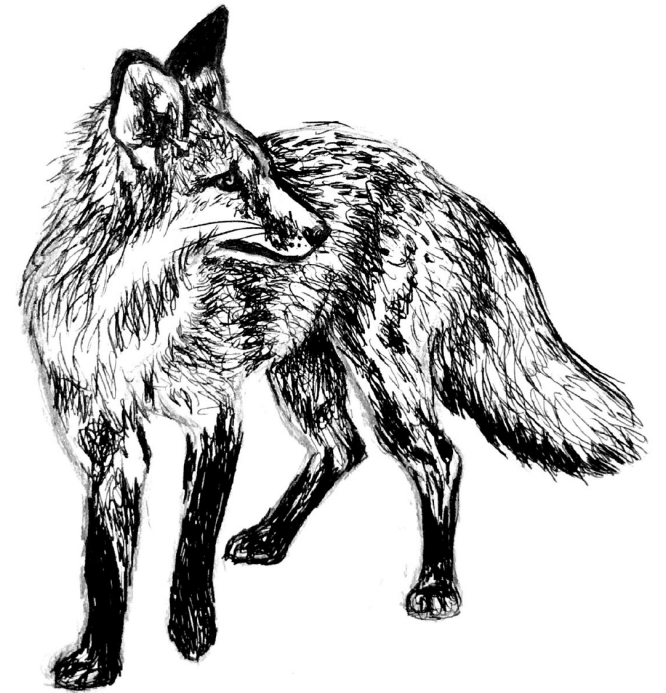


Communicating about Zoonotic Parasites in Pursuit of Public Health: Transmission and Prevention at the Human-Wildlife Interface

MPH Final Defense
Elizabeth Buller, DVM



Agenda

1. Introduction
2. Background
3. Applied Practice Experience
4. Products
5. Applications
6. Q&A



Introduction

- Background
 - Worked in low resource veterinary medicine
 - Obtained DVM from Kansas State University in May 2025
- Currently
 - Practicing as a small animal veterinarian
 - Operating with a One Health mindset





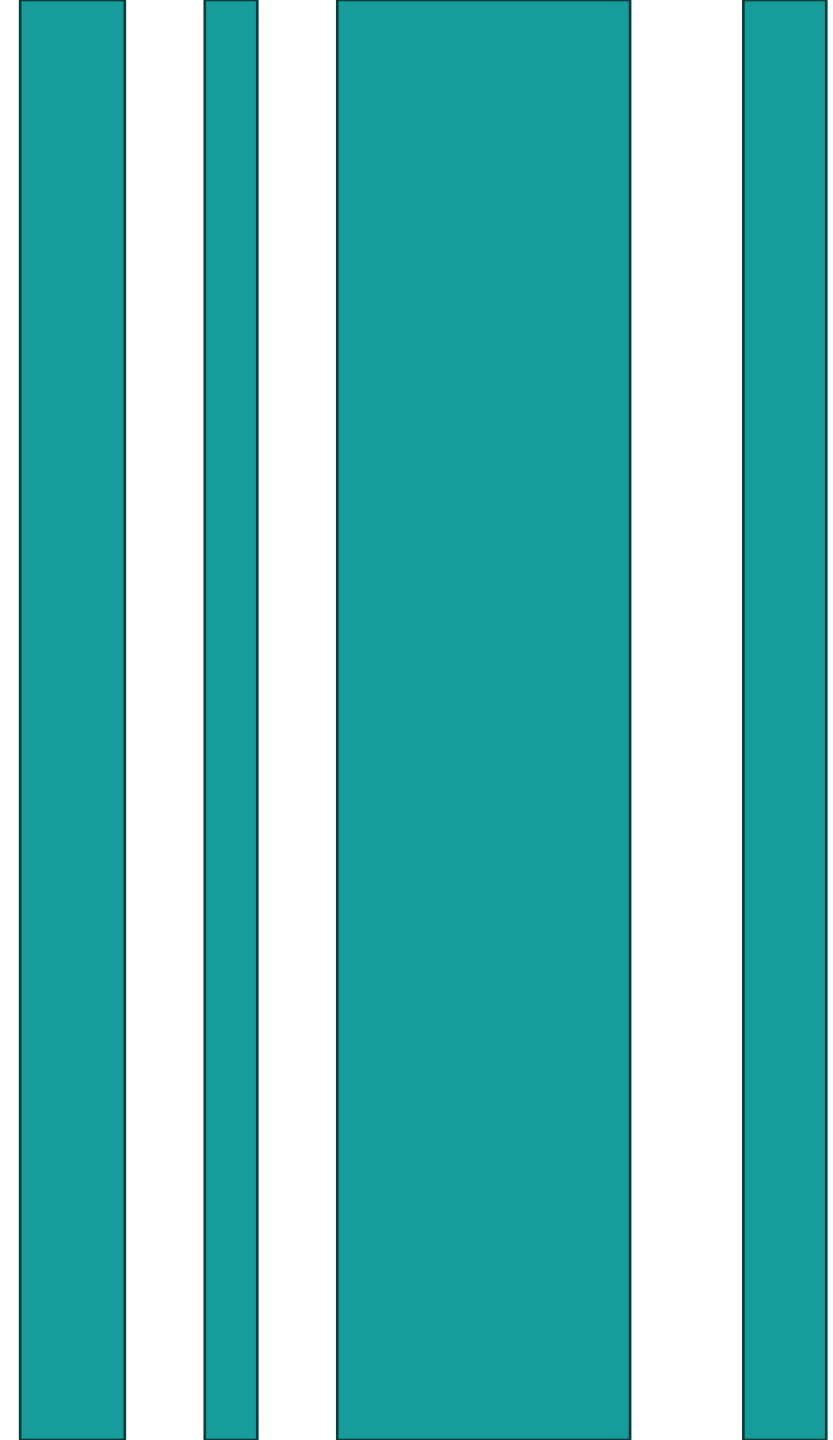
Applied Practice Experience

Site: Parasitology Lab, Kansas State University College of Veterinary Medicine

Preceptor: Brian Herrin, DVM, PhD, DACVM (Parasitology)

APE

- Reviewed current literature on zoonotic parasites in wildlife
- Identified over a dozen zoonotic parasites of significance
- Compiled information regarding life cycle, transmission, and human disease
- Formulated evidence-based preventive recommendations



Background:

Zoonotic Parasites in Wildlife



Image: https://www.hunter-ed.com/montana/studyGuide/Wildlife-Identification-White-Tailed-Deer-and-Mule-Deer/20202703_141127/

Wildlife as Vectors of Zoonotic Parasites

- Parasites are ubiquitous in wildlife (Jenkins, et al., 2015)
- Categories of transmission: fecal-borne vs. meat-borne
- Direct interaction through hunting, trapping, etc.

Urban Wildlife & Domestic Pets

- Urban wildlife contaminate the environment, leading to human exposure (Mackenstedt et al., 2015)
- Dogs and cats carry and perpetuate many zoonotic parasites

Neglected Infectious Diseases (Parise et al., 2014)

- Large number of people at risk, poverty
- Potential underreporting, misdiagnosis, lack of appropriate healthcare
- Dearth of interventions that can prevent or cure illness
- Inclusive of toxocariasis, cysticercosis, toxoplasmosis



Cases

Trichinosis

- 6 cases of human trichinosis following consumption of black bear meat from Canada (Cash-Goldwasser et al., 2024)
- 10 suspected cases in North Carolina following consumption of bear meat (Gowler et al., 2024)

Baylisascariasis

- 2 unrelated cases in children in California, one of which delayed diagnosis resulted in permanent neurologic defects (Vaughan et al., 2025)

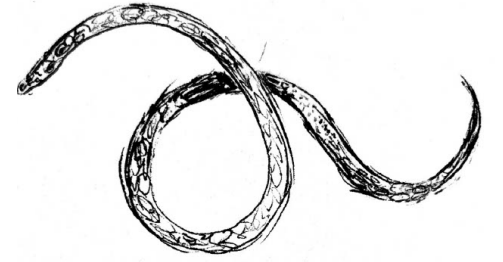
Toxoplasmosis

- 6 hunters became ill after eating undercooked venison (Gaulin et al., 2020)
- Suspected fecal contamination of Victoria's watershed with wild and domestic feline feces (Aramini et al., 1999)
- A fetal infection resulted in microcephaly in a newborn (Marrakch et al., 2024)

Toxocariasis

- 3 cases of probable ocular toxocariasis in the Mississippi Delta (Inagaki et al., 2019)
- Fatal case of visceral larva migrans in toddler (Wygant and Cohle, 2023)

Evidence-Based Preventive Practices



Fecal-Borne Parasites

- Wash hands for 20 sec with soap and water (CDC, 2024)
- Avoid areas that contain high parasitic loads (e.g., raccoon latrines) and practice hand hygiene after time outdoors
- Implement routine fecal testing, subsequent deworming, and regular flea/tick/heartworm prevention under the supervision of your veterinarian (CAPC, 2025)
- Identify and remove animal feces following safe guidelines (Center for Global Health, 2011). Pick up pet feces
- Wear shoes outdoors
- Monitor children, prevent ingestion of dirt, and teach them appropriate hand hygiene

Meat-Borne Parasites

- Wear disposable gloves when handling carcasses and preparing meat. Practice hand-hygiene after handling the carcass and throughout the cooking process.
- Cook wild game to a minimum internal temperature of 165°F, verified using a meat thermometer (Gowler et al., 2024)
- Clean countertops, cutting boards, and dishes used during preparation and cooking with warm, soapy water



APE Products



Wildlife Manual:



Source: <https://alaskawildlife.org/project/foxes/>

Best Practice Guidelines for Prevention of Zoonotic Transmission of Parasites from Wildlife

Target Audience

- Hunters
- Trappers
- Rehabilitators
- Conservationists

Human Disease

- Severe disease
- Chronic effects
- High prevalence

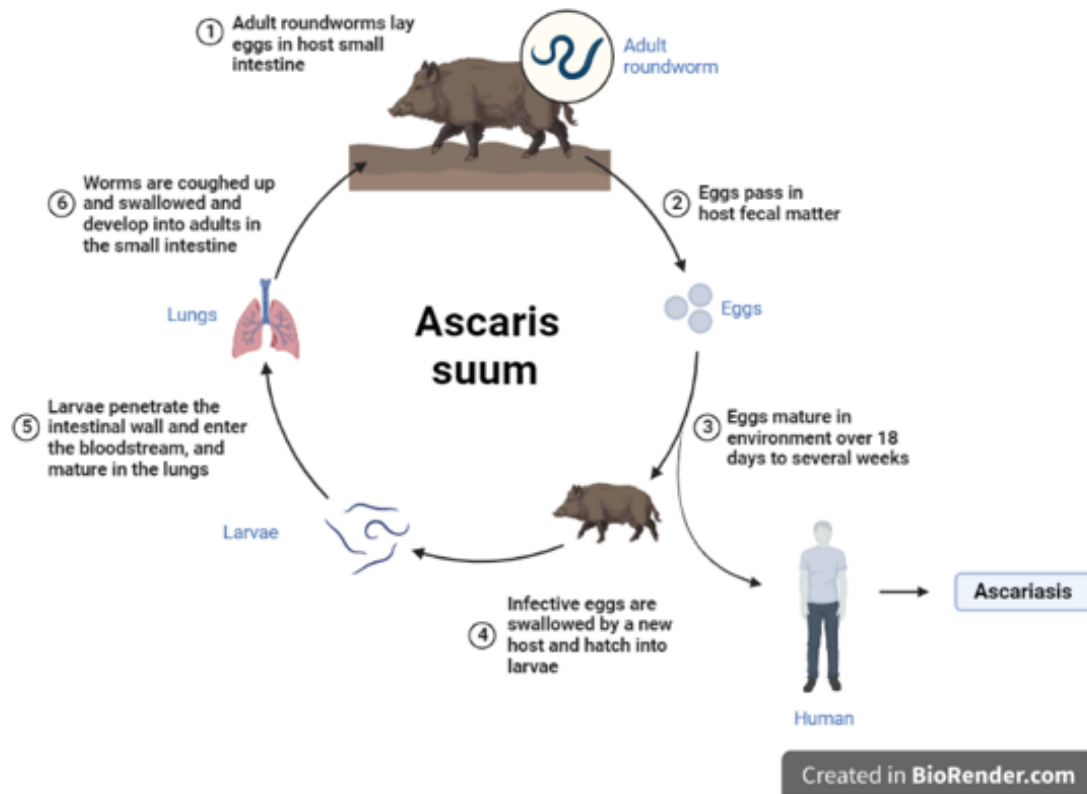
Life Cycles

- Points of transmission
- Areas for intervention

Preventive Measures

- Based on mode of transmission
- Tailored to each unique parasite

LIFE CYCLE



IMPORTANT POINTS

- Eggs passed in the feces (2) mature in the environment and become infective (3); once infective, they can survive for up to 10 years.
- Humans become infected by swallowing mature eggs (3)
- Cough may occur in humans during larval migration (5)
- GI signs are due to worms in the small intestine (1)

Commentary Article

- Parasites at Play: Preventing Zoonotic Transmission of Parasites from Wildlife
 - Future submission for publication in the *Wildlife Professional*
 - Mixed academic and non-academic audience
 - Summarizes relevant information with a focus on fecal-borne vs. meat-borne parasitic transmission



Personal Reflections and Applications

Translating Scientific Knowledge into Accessible Resources

- Challenges:
 - Translating scientific jargon into accessible language
 - Identifying lapses in effective communication
 - Maintaining scientific integrity while also prioritizing key points
- Moving forward:
 - Continue to revise products and improve communication strategies
 - Communicate with veterinary clients regarding important public health concepts

Public Health and Veterinary Medicine

- Zoonotic awareness
- Client education & communication
- Parasite prevention
- Globalization



MPH Foundational Competencies

- **Competency 7:** Assess population needs, assets, and capacities that affect communities' health
- **Competency 16:** Apply principles of leadership, governance, and management, which include creating a vision, empowering others, fostering collaboration, and guiding decision making
- **Competency 18:** Select communication strategies for different audiences and sectors
- **Competency 21:** Integrate perspectives from other sectors and/or professionals and advance public health
- **Competency 22:** Apply systems thinking tools to a public health issue

Infectious Diseases & Zoonoses Area Competencies

1. Evaluate modes of disease causation of infectious agents
2. Investigate the host response to infection
3. Examine the influence of environmental and ecological forces on infectious diseases
4. Analyze disease risk factors and select appropriate surveillance
5. Investigate the role of vectors, toxic plants, and other toxins in infectious diseases



Image: *Ancylostoma caninum*

Source: https://en.wikipedia.org/wiki/Ancylostoma_caninum

Continuing Discussion and Research

What is the true prevalence of human infection with zoonotic parasites?

What currently unknown or under-researched consequences do zoonotic parasites have on human health?

As human populations expand and the climate evolves, will we see an increase in zoonotic parasitic spillover events?

Are there ecological reasons to preserve parasites in wildlife, despite their potential for zoonotic transmission?

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Q & A