

Alberta

ALBERTA AGRICULTURE, FOOD AND
RURAL DEVELOPMENT



Detection of *Salmonella*, *Trichinella* and *Toxoplasma* Antibodies in Alberta Wild Boars at Slaughter

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2003 AICF, Edmonton

Food Safety

- ↑ importance worldwide
 - ❖ *Salmonella, Campylobacter, E. coli O:157*, residues
- Food borne disease cost (USA)
 - ❖ ~ 76 mil. illness
 - ❖ 325,000 hospitalizations
 - ❖ 5,000 deaths
- ↑ food safety initiatives

Food Safety and Pork

- ❑ **Pork → Food borne diseases**
 - ❖ Rarely in North America
 - ❖ More often in EU and Asia
- ❑ **↑ growth of wild boar farming**
- ❑ **Implicated in the epidemiology of zoonoses**
- ❑ **Major food safety issues**
 - ❖ *Salmonella, Trichinella, Toxoplasma gondii, Y. enterocolitica, Campylobacter, ???*
- ❑ **Little or no information about the prevalence in wild boars (except *Trichinella*)**



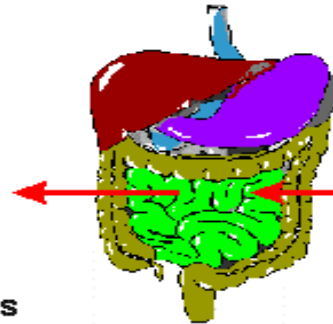
Wild Boars and *Salmonella*

- ❑ 52/154 carcasses *Salmonella* +ve (Australia, 91)
- ❑ 20/200 wild boar died of Salmonellosis (Spain, 99)
- ❑ 6/78 wild boar *Salmonella* sero +ve (Spain, 02)



The Life Cycle of *Trichinella spiralis* (causing trichinosis or trichinellosis in human)

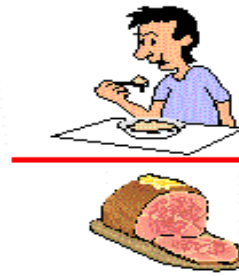
Male and female worms mate, females produce living juveniles.



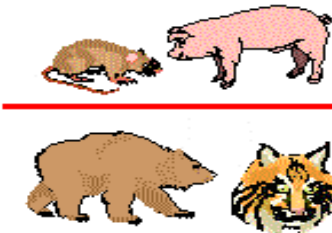
Juveniles are digested from muscle, penetrate into tissues of small intestine and grow to sexual maturity.

The juvenile worms migrate into muscles of the host and mature into the infective stage.

Humans are infected most often by eating improperly cooked meat products that contain infective juveniles.

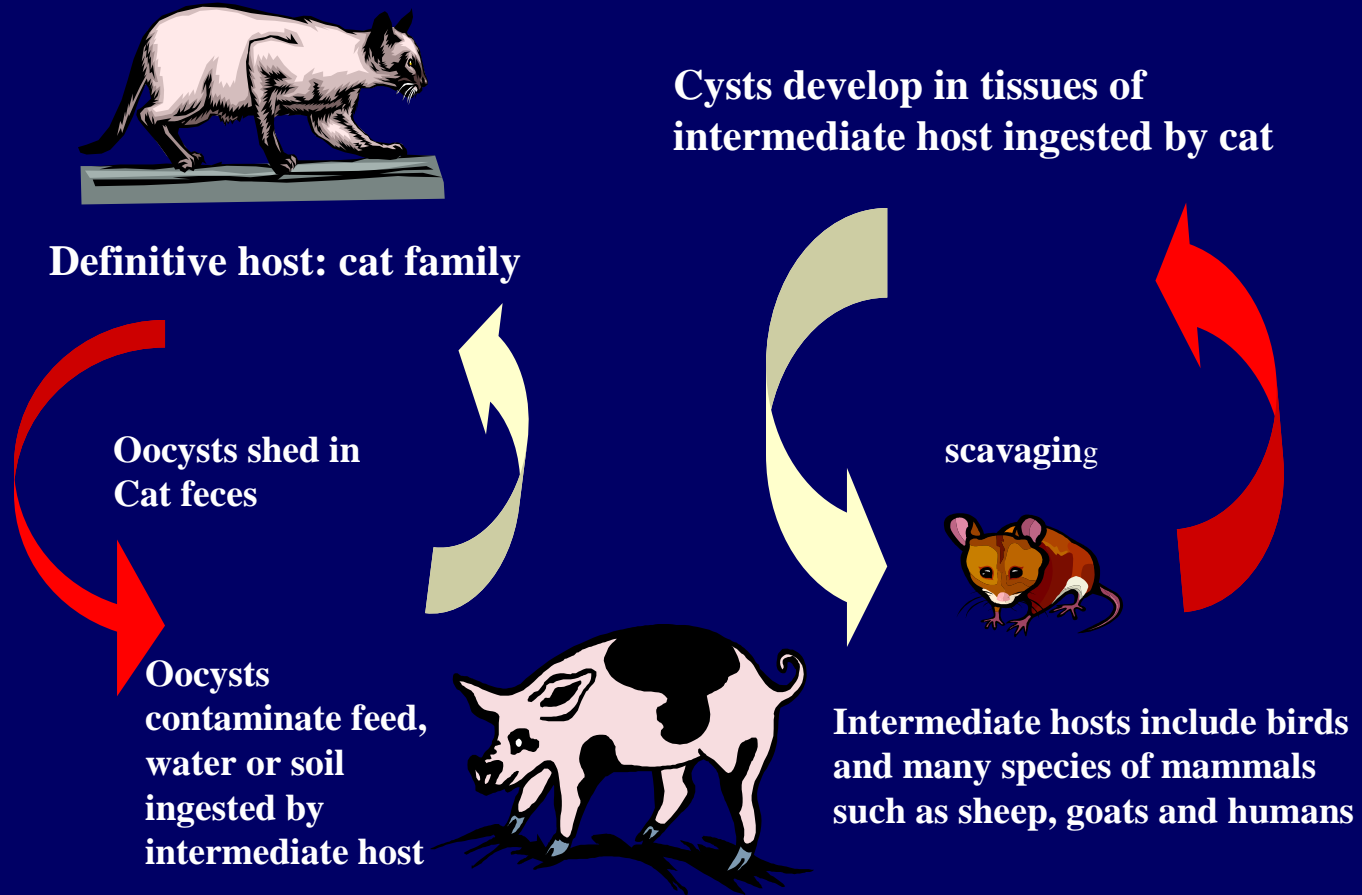


Carnivores and omnivores are infected when they eat meat containing the infective juvenile stage.



(Parasites and Parasitological Resources)

Simplified Life Cycle of *Toxoplasma gondii*

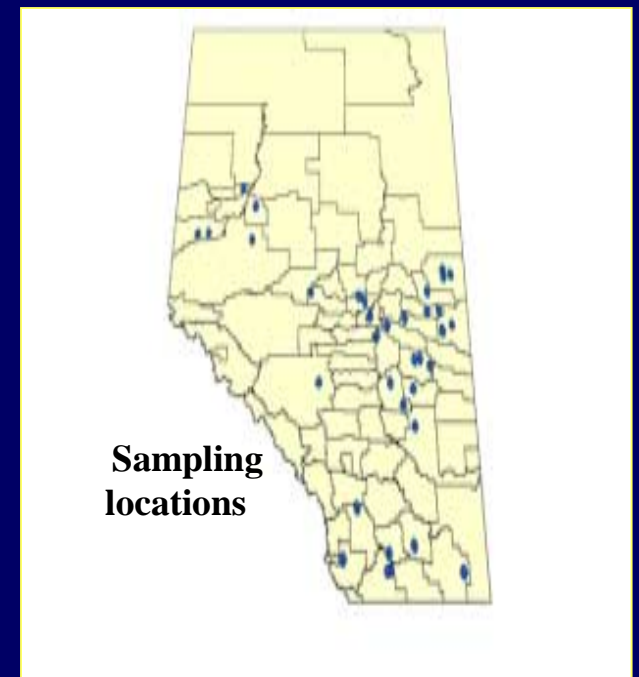


Study Objective

Evaluate the prevalence of *Salmonella*, *Trichinella* and *Toxoplasma* antibodies in 194 wild boars slaughtered in Alberta provincial abattoirs

Sample Size and Sampling

- ❑ **n=194 slaughter wild boars**
 - ❖ **n= 19 abattoirs**
- ❑ **Sample Type**
 - ❖ **Diaphragm (n=192),
tongue (n=174),
blood (n=183)**
- ❑ **Sample Collection**
 - ❖ **Between 06/00-06/01**
 - ❖ **n = 49 farms,**
 - ❖ **n = 36 province locations**



Sample Processing

- ❑ 5 g of each tongue/diaphragm were sampled for *Trichinella* digestion testing
- ❑ Bloods → sera → Ab testing
- ❑ 5 g of diaphragm was weighed, frozen and thawed for meat juice collection for antibody testing

Testing for Salmonella Antibodies

- ❑ *Salmonella* covalent mix-ELISA kit (Svanovir™)
 - ❖ *Salmonella enterica* polysaccharide O-antigens 1,4,5,6,7 and 12 (Serotype groups B and C)
 - ❖ +ve cut-off value
 - OD% = 40



Testing for Trichinella

❑ Artificial Digestion

- ❖ Samples minced and digested to free larvae from tissue → larvae concentrated → examined

❑ Serology

- ❖ Trichinella ELISA (SafePath Lab)
 - ❖ +ve cut-off OD value
 ≥ 0.3
 - ❖ Test Se¹ = 98.4%
 - ❖ Test Sp¹ = 100%
- (1 - according to manufacturer)



Testing for Toxoplasma Antibodies

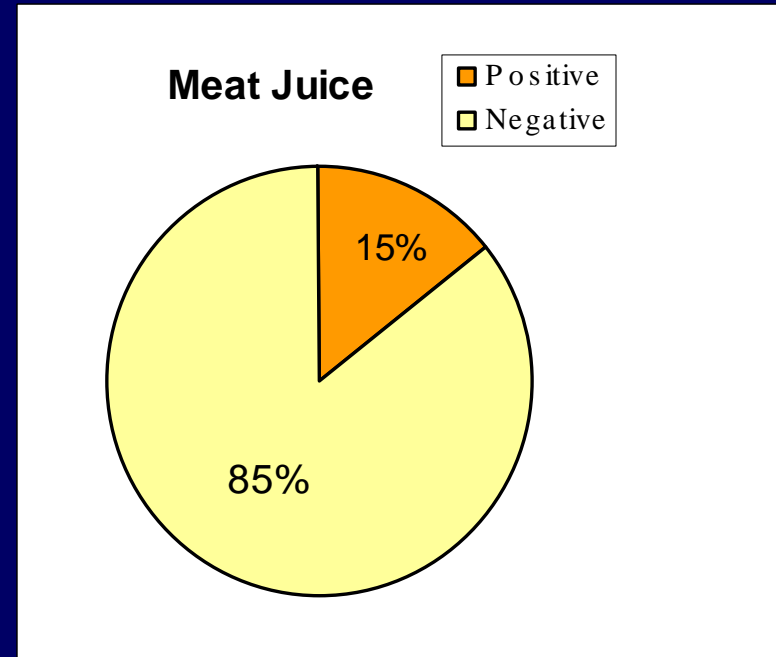
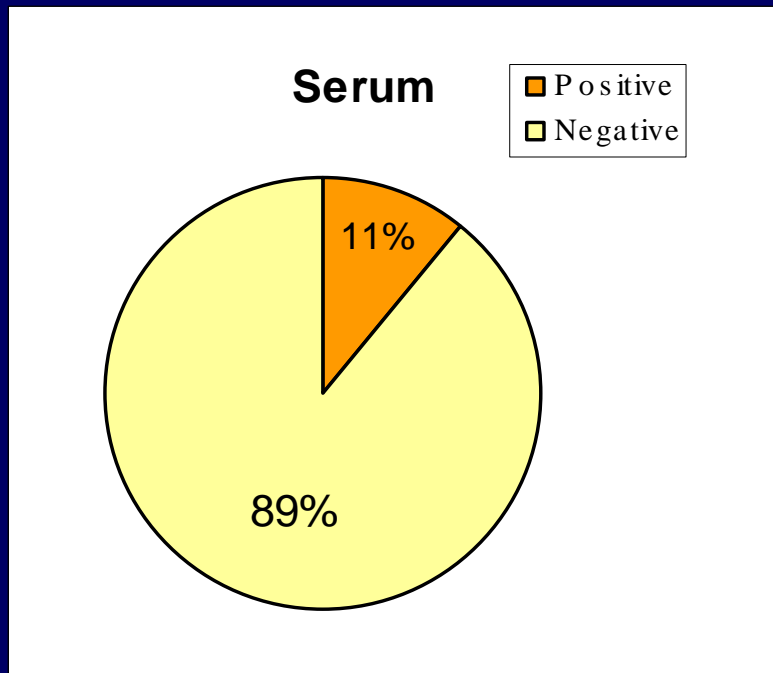
❑ ELISA for Toxoplasma gondii (SafePath Laboratories, U.S.A.)

- ❖ +ve cut-off OD value ≥ 0.2
- ❖ Test Se¹ = 100%
- ❖ Test Sp¹ = 100%

(1 - according to manufacturer)



Salmonella Serology Results

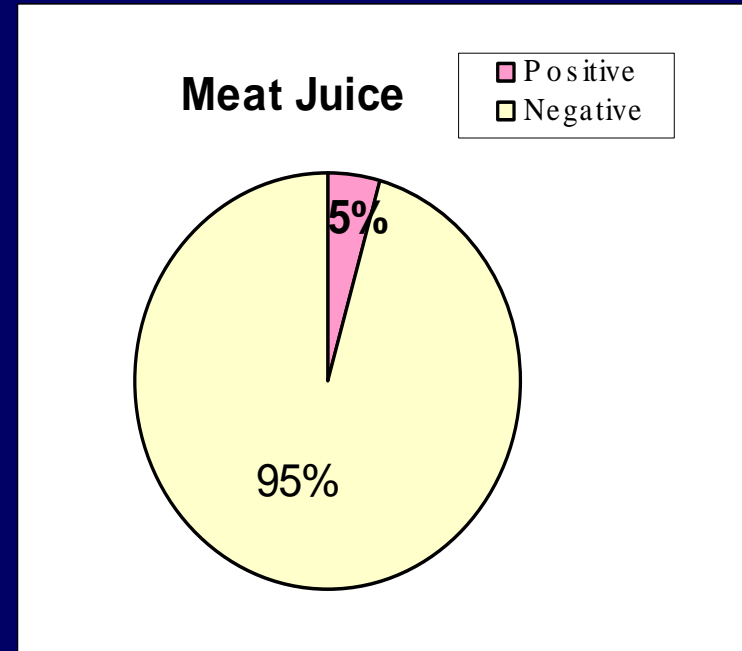
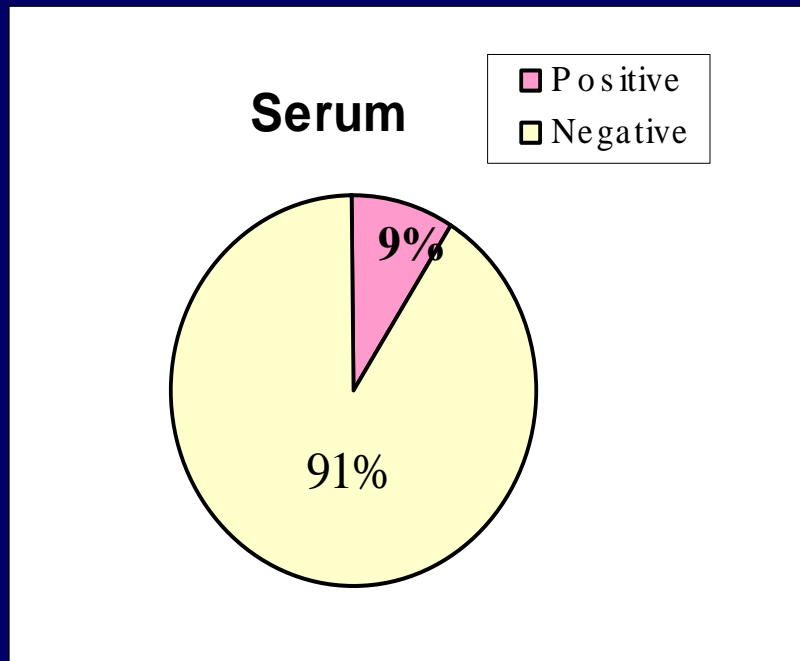


- ❑ n=183 sera, n=192 meat juice
- ❑ 27/49 farms with ≥ 1 =+ve serum or meat juice
- ❑ 21/36 locations with ≥ 1 =+ve serum or meat juice

Trichinella prevalence in Alberta Slaughter Wild Boars

Sample Type	Tested	Positive (%)	Negative
Tongue	174	0	174
Diaphragm	181	0	181
Serum	108	1 (0.92)	107
Meat juice	143	2 (1.4)	141

Toxoplasma Serology Results



- ❑ n=183 sera, n=192 meat juice
- ❑ 10/49 farms with ≥ 1 = +ve serum or meat juice
- ❑ 21/36 locations with ≥ 1 = +ve serum or meat juice

Implications

- ❑ Trichinella results indicated a very rare exposure to this organism among slaughter wild boars confirming that this is not a significant public health risk in Alberta.
- ❑ Salmonella and Toxoplasma serological results indicated a low level of exposure to these organisms among slaughter wild boars suggesting that this population might not pose a significant public health risk.

Implications

- ❑ Surveillance studies based on well designed sampling protocols and **valid laboratory tests** are needed to understand the dynamics, levels of contamination and ecology of these infections in wild boars

Acknowledgement

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