



CONTROLLING CELLULITIS

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CONTROLLING CELLULITIS

- ▶ Description of the condition
- ▶ Statistics
- ▶ How does develop cellulitis?
- ▶ Risk factors associated with cellulitis
- ▶ Time for the lesion to develop
- ▶ Preventive measures

Description of the condition

- ▶ Cellulitis is only detected at slaughter
- ▶ Externally, the inspector will see a thickened, yellow area in the abdominal region

Description of the condition

- ▶ Internally, when the skin is cut, there is a plaque of caseous material and the underlying muscles maybe hemorrhagic
- ▶ The size and the extent of the lesion do vary depending on the age and the severity of the inflammation

Description of the condition

- ▶ Chronic lesions are well circumscribed and often small
- ▶ The bacteria *Escherichia coli* is commonly found in these lesions, often beyond the boundaries of the lesion

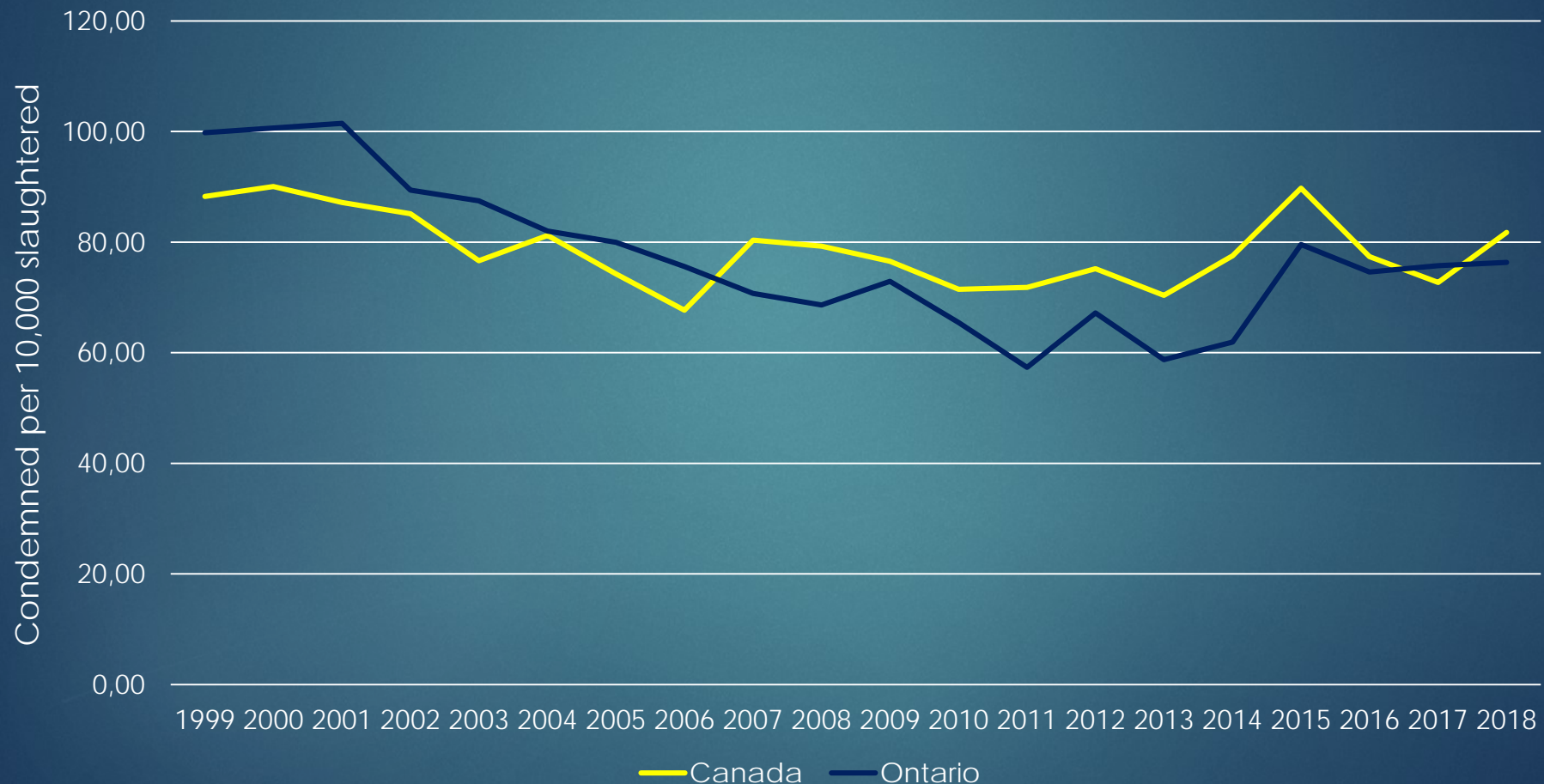
Description of the lesion

- ▶ *E. coli* isolated from cellulitis lesions have not been linked to any illness in humans
- ▶ In one study, genetic analysis has shown some relationship to *E. coli* causing septicemia and meningitis in humans (Ngeleka et al., 1996)
- ▶ In another study, such relationship could not be demonstrated (Caya et al., 2000)

Epidemiological trends

- ▶ First recognized in 1981 by Agriculture Canada as a new skin condition
- ▶ First appearance on condemnation records in 1986
- ▶ In 1986: 160,405 (0.048% of total slaughter or 2.73% of total condemnations)
- ▶ In 1996: > 2.6 Millions (0.56% of total slaughter or 30.1% of total condemnations)
- ▶ Considered the most important reason for condemnations
- ▶ In 2008: called 'subcutaneous condition' in CFIA reports

Condemnations for cellulitis* in Canada and Ontario between 1999 and 2018



* Called subcutaneous condition starting in 2018

How does develop cellulitis?

- ▶ Cellulitis is caused by a skin scratch which get infected by the bacteria *Escherichia coli* (Peighambari et al., 1995, Norton et al., 1997...)
- ▶ The poorly closed navel theory is obsolete

How does develop cellulitis?

- ▶ Why do we see more scratches?

How does develop cellulitis?



- ▶ Why and how does occur scratch contamination?

Risk factors associated with cellulitis

Feathering

- ▶ Feather coverage
- ▶ Sex
- ▶ Temperature

Risk factors associated with cellulitis

Densities

- ▶ Feeder and drinker densities
- ▶ Pen density

Risk factors associated with cellulitis

Litter humidity

- ▶ Litter caking
- ▶ Litter humidity
- ▶ Type of drinker

Risk factors associated with cellulitis

Water quality

- ▶ Water chlorination
- ▶ Type of drinkers

Risk factors associated with cellulitis

Bacterial contamination of the environment

- ▶ Disinfection
- ▶ Downtime

Risk factors associated with cellulitis

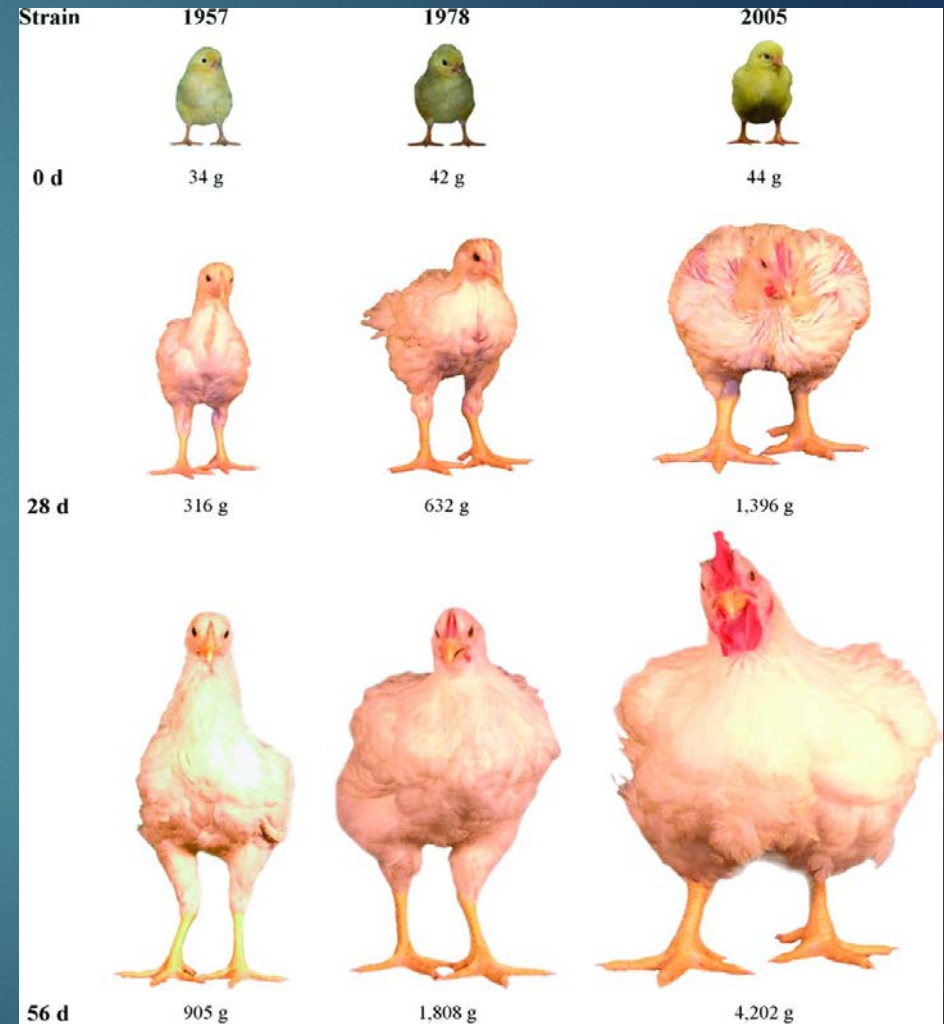
The bacteria

- ▶ Isolates from cellulitis lesions have the virulence factors associated with the Avian Pathogenic *E. coli* (APEC) pathotype (Barbieri et al., PlosOne 2013)
- ▶ Possible role of a cytotoxin, the *E. coli* Vacuolating factor (Quel et al., Vet Micro, 2013)
- ▶ Bacterial virulence factors do play a role in the adherence and attachment of the bacteria to the skin tissues (Leclerc et al., Avian Dis. 2003)
- ▶ There is likely an endemic *E. coli* population in the broiler house environment (Singer et al., Vet Micro, 2000)

Risk factors associated with cellulitis

Immunity

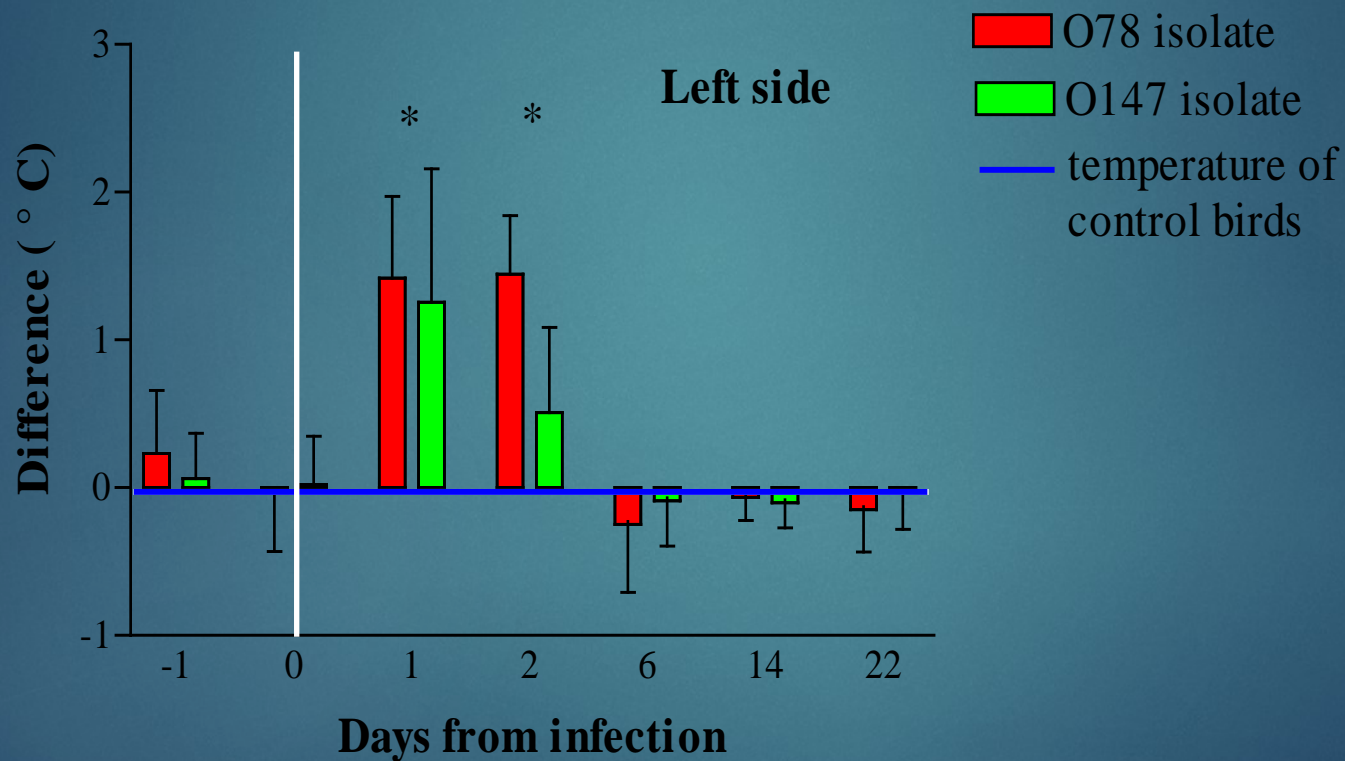
- ▶ Immunosuppressive diseases
- ▶ Genetic?



Time for the lesion to develop

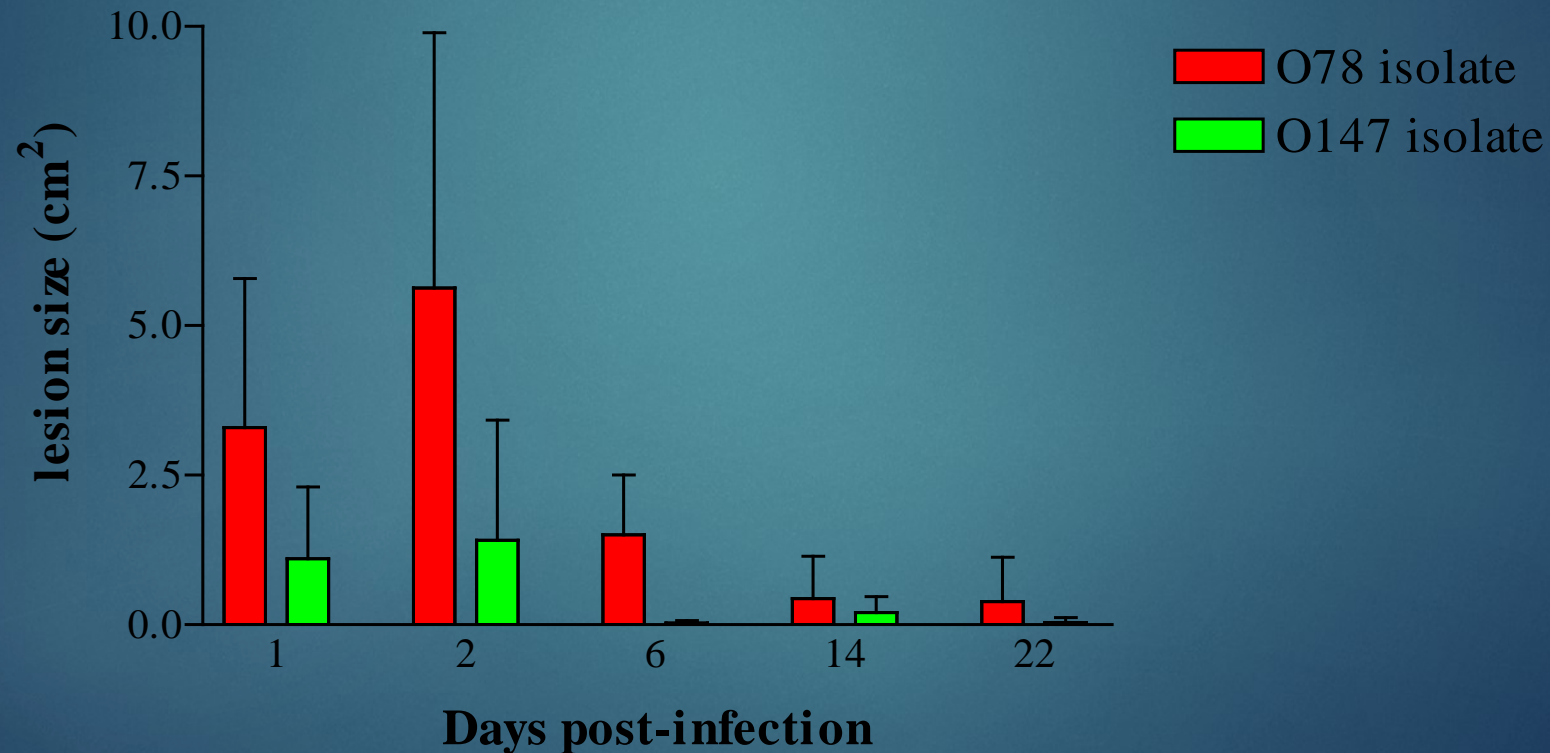
- ▶ Experimental infections
- ▶ Use of medical thermography in live chickens

Skin temperature of infected birds compared to control birds (mean \pm std)



* P = 0.0031

Lesion size evolution of the right abdominal side (mean \pm std)



Time for the lesion to develop



- ▶ 2 days pi vs 14 days post-infection

Preventive measures

Feathering

- ▶ Barn temperature
 - not too warm!
but not too cold!!!
- ▶ Diet
 - total sulfur A.A.
 - Vitamin E
 - Organic Zinc

Preventive measures

Decrease chances of scratches

- ▶ Keep birds calm and comfortable
(temperature and light intensity)
- ▶ If birds are extremely nervous... (use of tryptophan, synthetic methionine analog, vitamin C...)

Preventive measures

Bacterial load of the environment

- ▶ Cleaning, disinfection, fumigation
- ▶ Get the old litter out
- ▶ Downtime
- ▶ Effect of litter acidifiers?
- ▶ Effect of probiotics?

Preventive measures

- ▶ The importance of timing...