

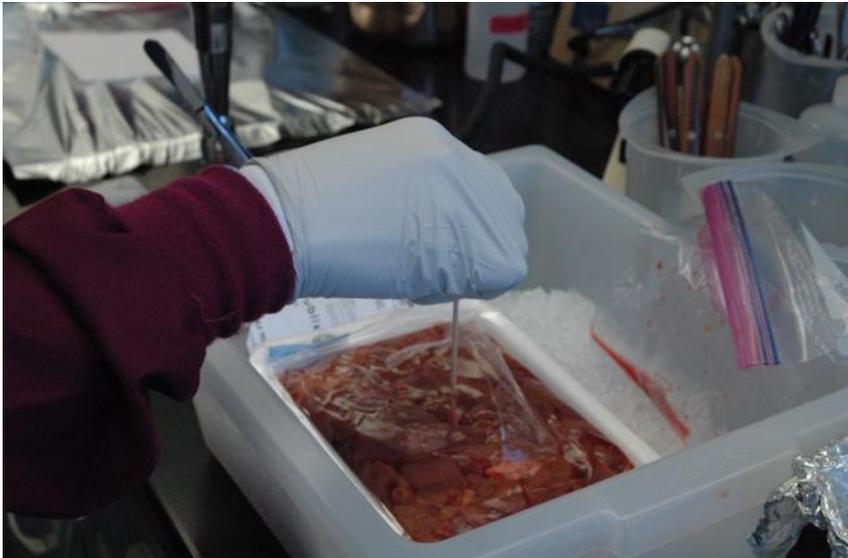
Prevalence and MLST subtypes of  
*Campylobacter* in retail chicken livers

# Survey design

- 5 sample days – purchased at local retail grocery stores
- 3 containers of livers/day
  - each package with unique combination of plant number and sell by date
- 3 livers/container (N=45)
  - and 1 exudate sample
- 3 samples per liver

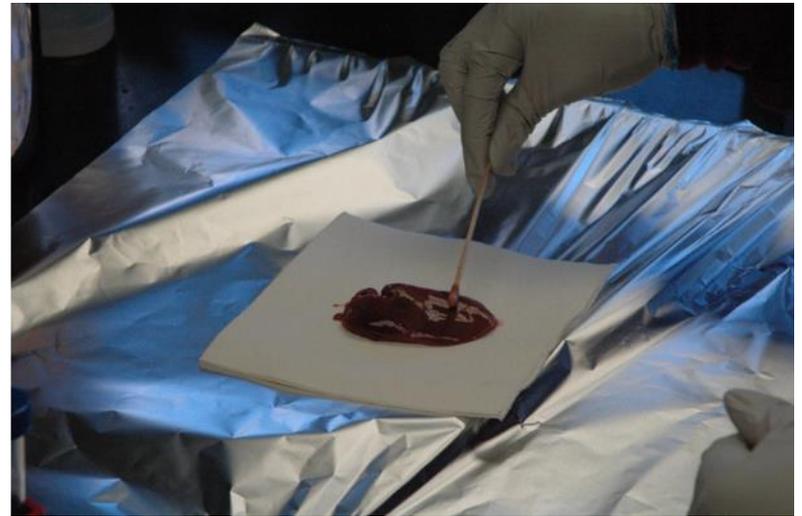
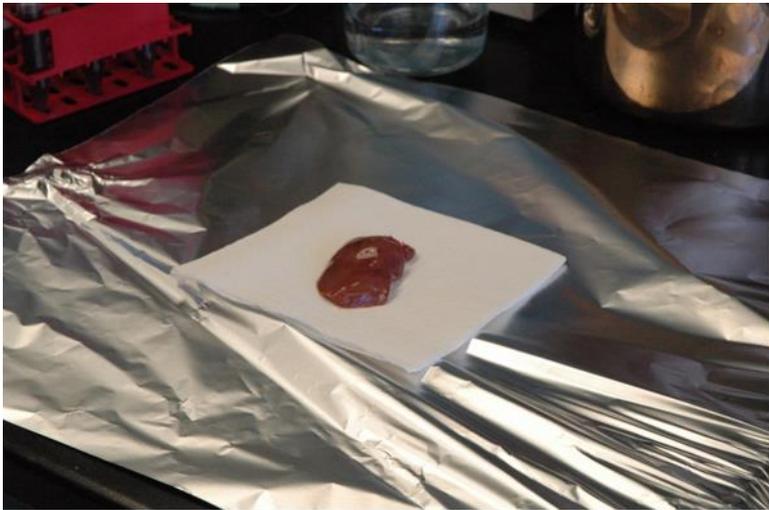
# Sampling - exudate

- Sterile swab used to sample exudate.
- Soaks up approximately 0.1 mL
- Volume of exudate within package is variable



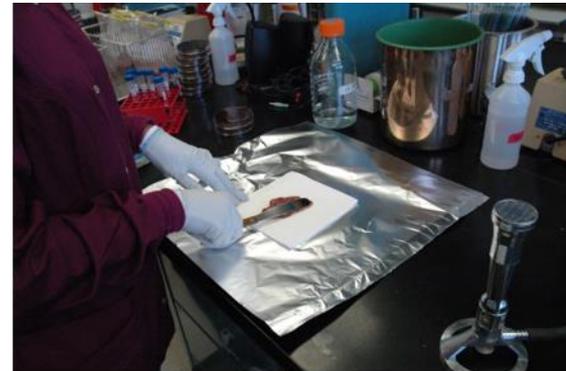
# Sampling – external surface

- Surface sampled by sterile swab moistened in CEB



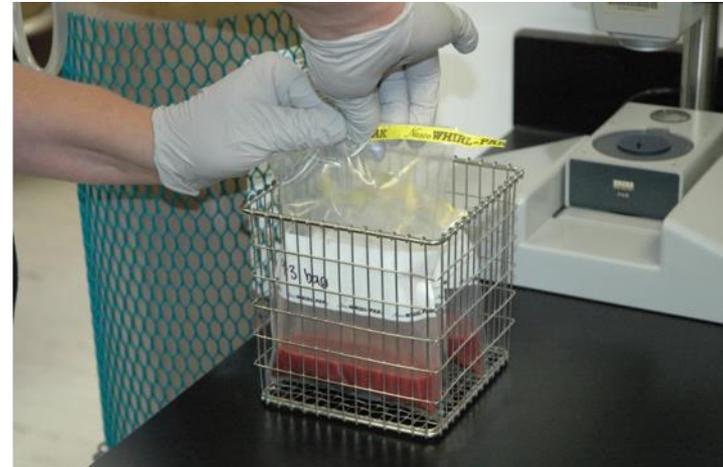
# Sampling – internal tissue

- Seared liver surface to allow sampling of internal tissue without external contaminants.



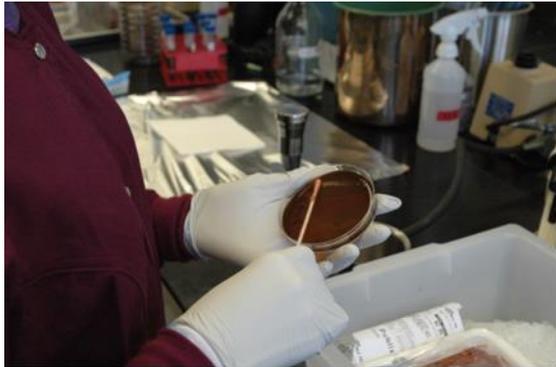
# Sampling – whole liver

- After external and internal swab samples were collected, each liver was stomached in CEB



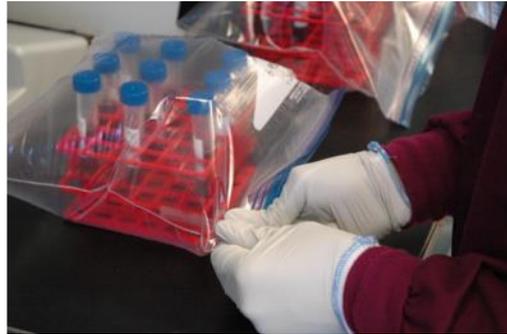
# *Campylobacter* culture

- All samples were direct plated on CCA and enriched in CEB.



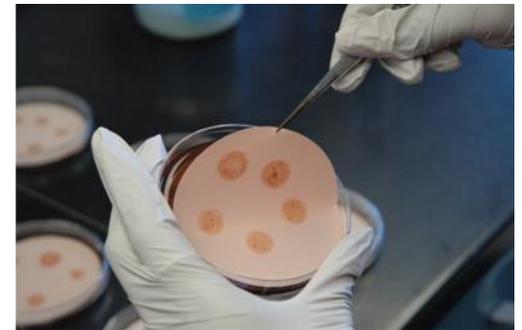
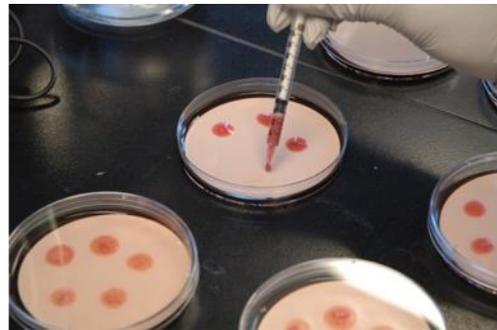
# *Campylobacter* culture (2)

- Incubated 42° C in re-sealable bags flushed with microaerobic gas mix.



# *Campylobacter* culture (3)

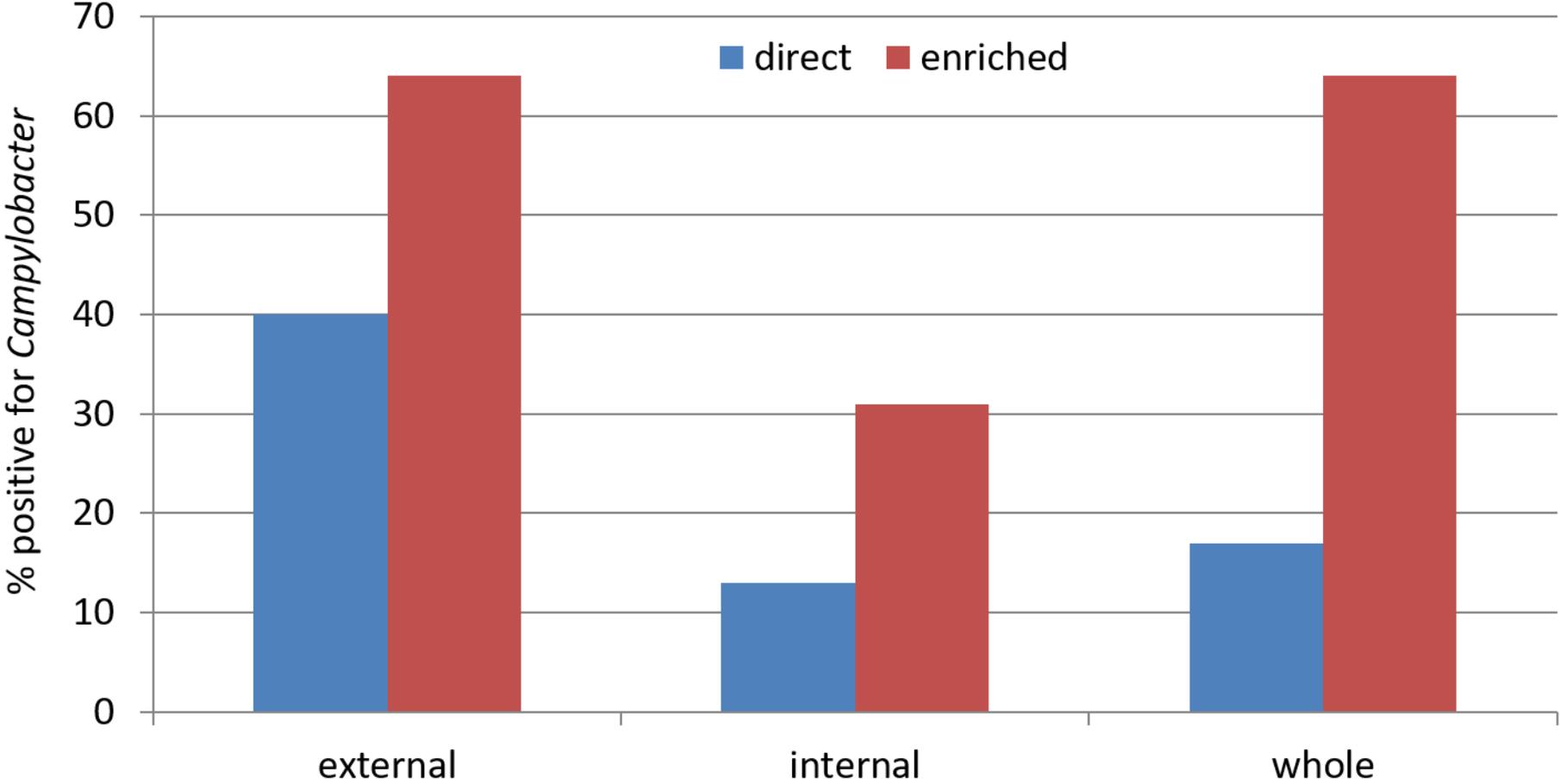
- Whole liver enrichment samples were heavily contaminated with non-*Campylobacter*. Employed a selective filter method.



# *Campylobacter* subtyping

- One colony of most prevalent *Campylobacter* colony type selected from each positive sample
- 82 isolates.... one not recovered from frozen storage; 81 subtyped
- Extracted DNA – Mobio
- Sequenced Genomic DNA – MiSeq
- Mapped sequences using 7-gene MLST scheme – Geneious
- Assigned MLST Clonal Complex (CC) and Sequence Type (ST) - pubmlst

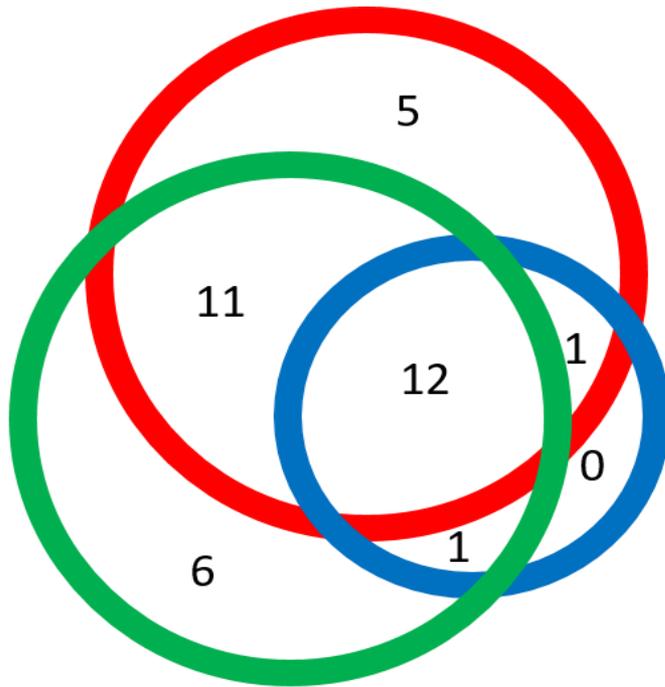
# Detection of *Campylobacter* in chicken liver by sample type



Campy detected in at least one sample from each container

# Detection of *Campylobacter* from samples of the outside, inside and whole chicken livers

n=45; *Campylobacter* detected in total of 35 livers



*Campylobacter* detected

Outside: 29 livers

Inside: 14 livers

Whole: 30 livers

# Detection of *Campylobacter* in exudate

- 9+/13 containers by direct plating
- 10+/13 containers by enrichment
- Note: in all three containers in which no *Campylobacter* was detected by exudate sample, *Campylobacter* was detected on at least one liver

# *Campylobacter* species detected

- *C. jejuni* and *C. coli*
- Species detected was more related to container than to sample type
  - Probably due to flock
- *C. jejuni* was the only species detected in 10 containers
- *C. coli* was the only species detected in 4 containers
- Both species were detected in 1 container (container 12)
- Both species were detected on the same liver twice (both in container 12)

# *Campylobacter* MLST types detected

- Detected 15 different sequence types (ST)
- Representing 7 different clonal complexes (CC)
- External: 9 STs/29 isolates typed – 0 unique
- Internal: 8 STs/14 isolates typed – 0 unique
- Whole: 12 STs/28 isolates typed - 2 unique
- Exudate: 9 STs/10 isolates typed – 1 unique

# MLST subtypes detected

- All CCs and 14 of 15 STs detected have been previously reported as found in human (clinical) and/or chicken sources (pubmlst).
- The other ST had not been previously reported to pubmlst but is a member of a common CC.

# Conclusions and upcoming work

- This limited retail survey supports earlier reports describing outbreaks of *Campylobacteriosis* from undercooked chicken liver.
- Currently working to determine prevalence of *Campylobacter* associated with chicken livers in carcasses at slaughter.
  - We will compare subtype that we detect in liver to the subtype we detect in gut of same bird.