

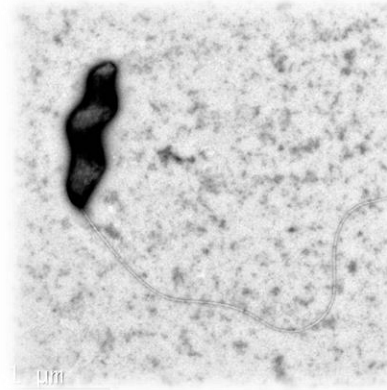
Campylobacter hepaticus :
what method to be developed
to detect this weird *Campylobacter* ?

Elisabeth Repérant, Bérengère Nagard, Martine Denis (Anses-French NRL)

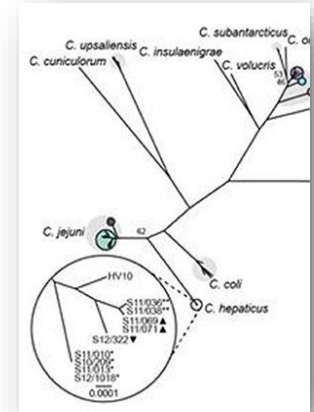
Jean-Charles Donval (*Chêne vert*)

Campylobacter hepaticus:

- Gram –
- S-shaped
- 0.3 – 0.4 μm wide & 1 – 1.2 μm long
- Single bipolar flagella
- Reduced genome size : 1.48 – 1.51 Mb
- Genetically close to *C. jejuni* & *C. coli*
- Growing under microaerobic conditions at 37°C /42°C on blood agar



Gregory et al (2018) Avian Diseases, 62:79

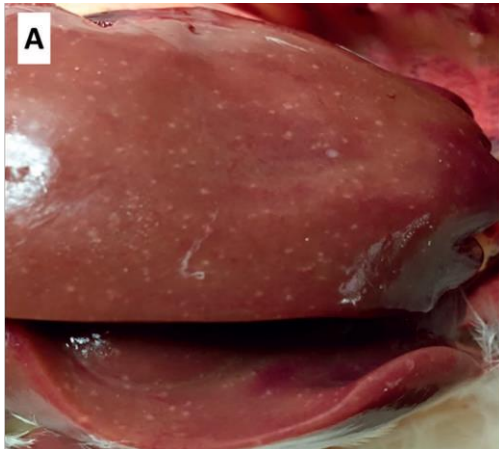


Petrovska et al. (2017) Front. Cell.Infect. Microbiol. 7:354



***Campylobacter hepaticus* :**

- Novel *Campylobacter* isolated in 2015 in UK, in 2016 in Australia
- Causing **spotty liver disease** (SLD) in free-range layers
- No official standardized method for its detection



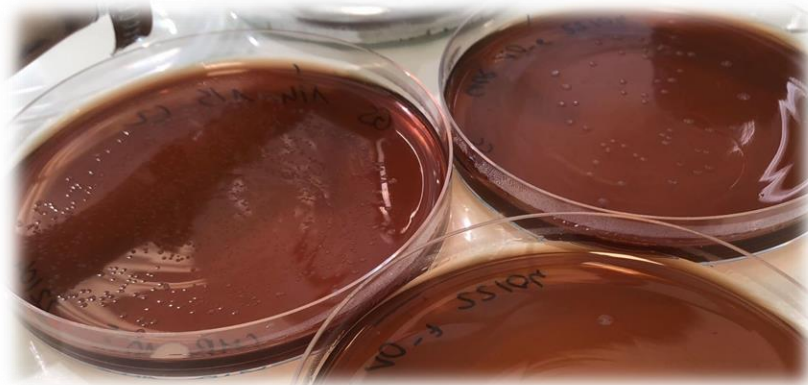
Gregory et al (2018) Avian Diseases, 62:79



Method tested by the French NRL for Campylobacter following Van et al (2016) Int.J Syst.Evol.Microbiol. 66:4518

C. hepaticus (CIP 111092T = NCTC 13823T from Crawshaw et al, 2015 & Van et al, 2016)

- No growth on selective media (mCCDA, Butzler, CASA)
- Growth on Brucella & Columbia agar ± blood
- Slow growth : 72h - 96h at 37°C under microaerobic conditions



Field strain *C. hepaticus*

- isolated from **bile**, from a dead hen
- enriched in Preston broth for **10 days at 37°C** under microaerobic conditions
- incubated on Brucella & Columbia agar + blood for **6 days at 37°C**, under microaerobic conditions
- no detection in other samples (liver, bone, intestine, spleen)



What experience from field vets ?



Field veterinarians :

- Conventional layers in cages & alternative systems
- Broiler & layer breeders

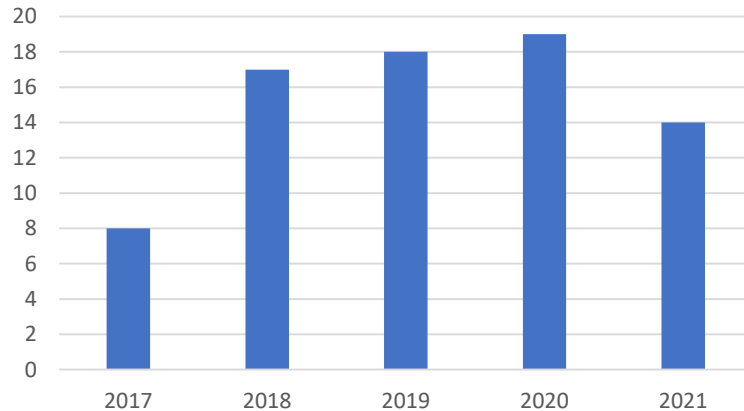


Laboratory :

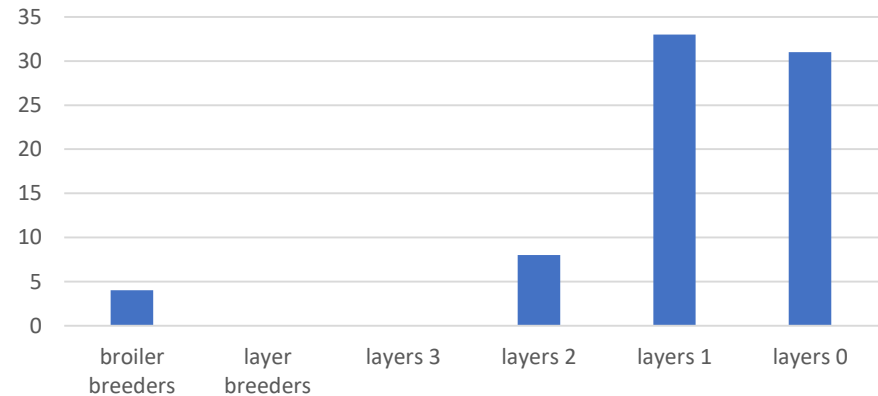
- necropsy
- specific PCR

Number of cases

Contaminated batches –
all productions – 2017-2021



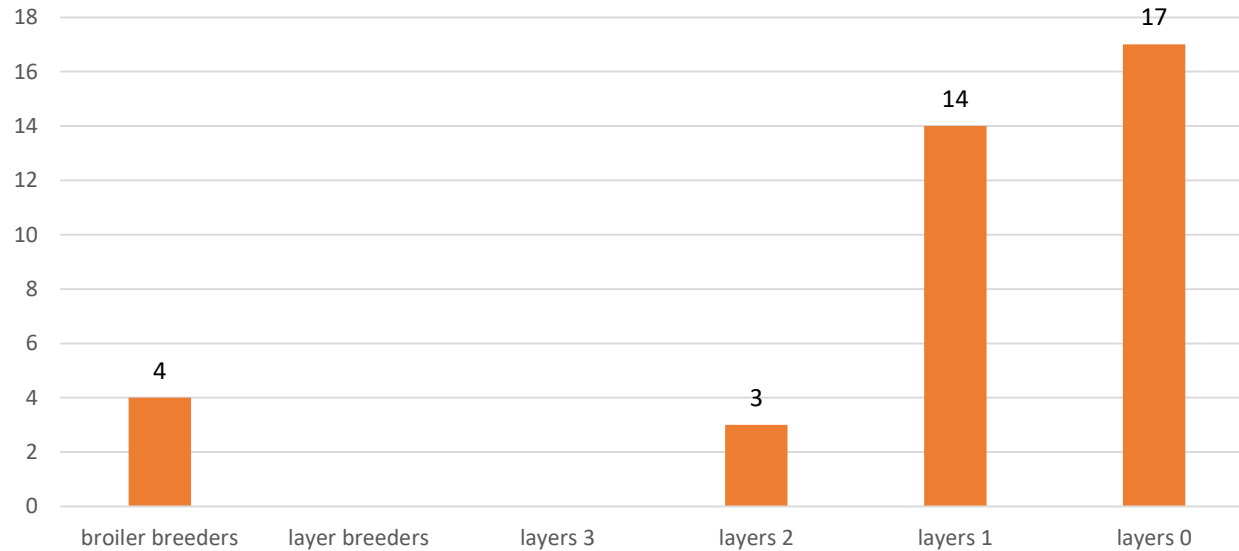
Cumulative number of cases per production
2017 - 2021



Layers 0 : organic free-range,
Layers 1 : free-range
Layers 2 : ground
Layers 3 : cages

Number of cases

Cumulative number of flocks sorted per production - 2017 - 2021



Layers 0 : organic free-range,
Layers 1 : free-range
Layers 2 : ground
Layers 3 : cages

Clinical & lesional characteristics

- Sudden mortality
- White spots all over the liver
- Associated signs & lesions : *i.e. decrease in production, maldigestion*

Epidemiological characteristics

- Layers at the beginning of production
- Seasonal disease: April to October
- Layers bred in alternative systems (*some in broiler breeders / never in cages*)
- High density production area ?

Conclusions :

- obvious clinical signs & lesions
- recurrence of the disease
- Risk factors (*ground farming, warm temperature, young animals,...*)
- Economic impact (*mortality, decrease in production, treatment costs,...*)



CoVetLab joint research project 2021 (Anses, SVA, APHA, WUR)

METhepaticus : Development of tools to detect *Campylobacter hepaticus*, the causative agent of Spotty Liver Disease in poultry.

WP1: LABORATORY METHODS FOR *C. HEPATICUS*

- T1. Bacteriological method for detection of *C. hepaticus* and recovering of isolates
- T2. Molecular method for detection of *C. hepaticus* and confirmation of isolates as *C. hepaticus*
- T3. Method for enumeration of *C. hepaticus*

WP2: THE ORGANISATION OF AN INTERLABORATORY STUDY

- T1. The production of stable reference material
- T2. The organisation of an ILS

WP3: SAMPLING AND TRANSPORTATION PROCEDURES

- T1. Survival studies
- T2. Production of sampling protocols

CONCLUSION

- Incidence of SLD increasing with free-range egg production
- No standardization of treatments / sanitary measures
- Efficient detection of *C. hepaticus* will provide new opportunities to control this pathogen.

QUESTIONS ?

- How do birds become infected ?
- Why & how does *C. hepaticus* cause liver damage ?
- Why is *C. hepaticus* so pathogenic although genetically close to *C. jejuni* & *C. coli* ?
- How to control this pathogen in the farms ?

...

Questions ? Comments ?...

Thank you 😊

