

Scientific and Steering Committee, 8-10<sup>th</sup> June 2022, PhnomPenh, Cambodia

# Prevalence and antibiotic resistance of *Campylobacter* spp. in the chicken farm in Hai Phong province

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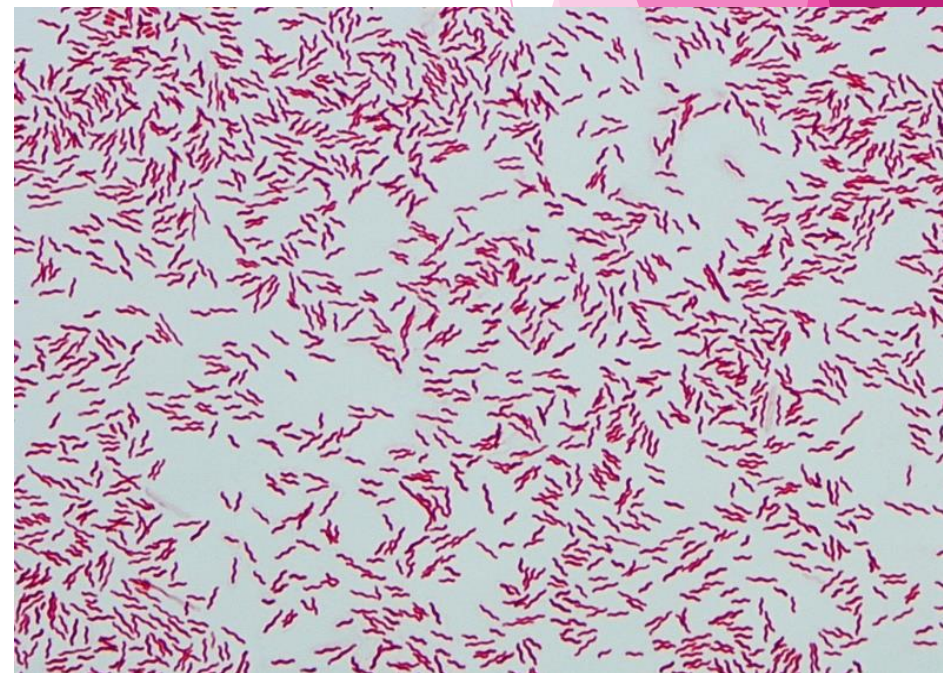
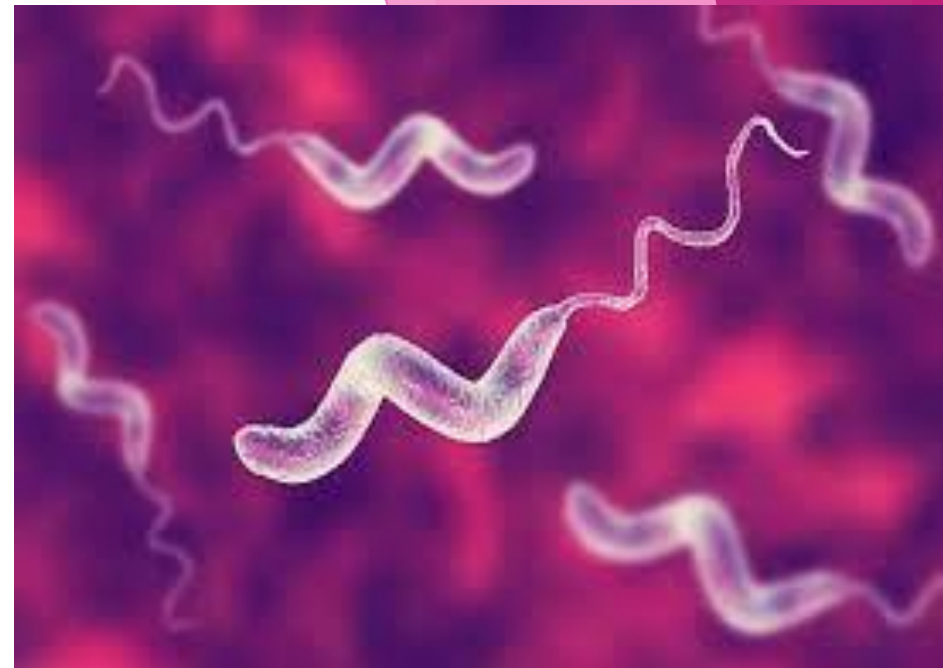


# Introduction (1)

- ▶ This study is a part of joint project between Vietnam and Germany (Bioeconomy International): “*Development and standardization of Realtime PCR approach for quantitative and risk assessment of Campylobacter infection in international global strategy*” (CAMPY TRACE project), from 2016-2020.
- ▶ German partners: Federal Institute for Risk Assessment (BfR), National Reference Laboratory for Campylobacter and Bavarian Health and Food Safety Authority (LGL).

## Introduction (2)

- ▶ *Campylobacter* is the most reported foodborne gastrointestinal bacterial pathogen worldwide.
- ▶ *Campylobacter* species are gram-negative, motile, curved-rod shaped, approximately 0.2 to 0.5  $\mu\text{m}$  wide and about 0.5 to 5  $\mu\text{m}$
- ▶ *Campylobacter* spp. (*C. jejuni*) is strictly microaerophilic (require low level of  $\text{O}_2$ , best atmosphere: 3 to 8%  $\text{O}_2$  and 5 to 15%  $\text{CO}_2$ ), capable to grow at 37°C-41.5°C.





## Introduction (3)

- ▶ Domestic poultry (e.g., chickens, turkeys, ducks, and geese) and wild birds are frequently infected with thermophilic *Campylobacter* (*C. jejuni* and *C. coli*).
- ▶ Both *C. jejuni* and *C. coli* are well adapted to the avian host and reside mainly in the intestinal tract of birds.
- ▶ The poultry reservoir, especially broiler meat, is recognized as the most-important vehicle for *Campylobacter* transmission to humans.

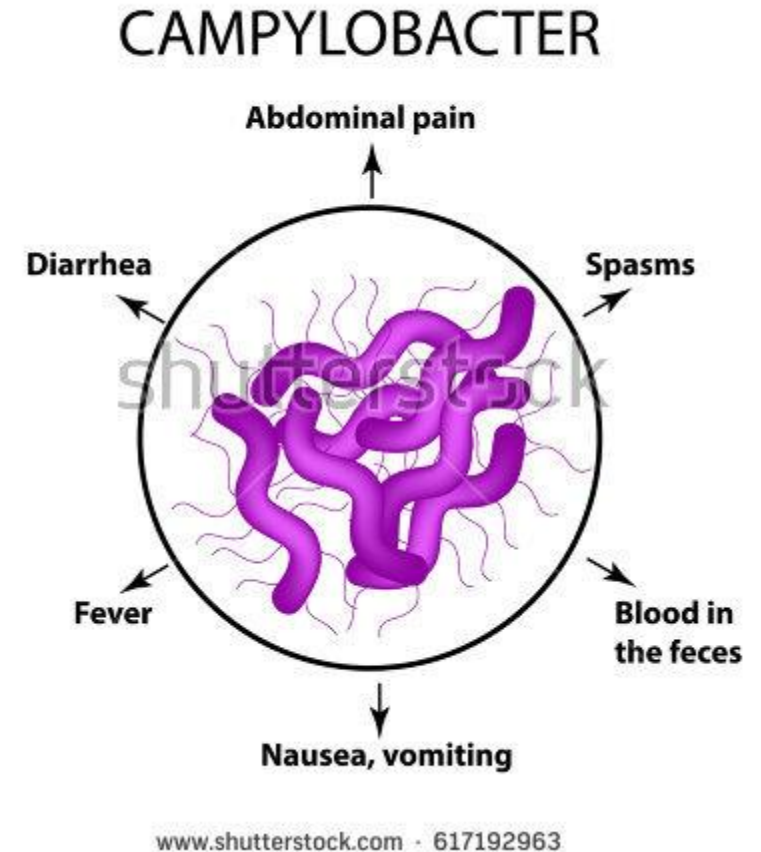


## Introduction (4)

- ▶ *Campylobacter* infections are mainly transmitted through the consumption of contaminated food and through faeces.
- ▶ Poultry meat - especially chicken meat - is the most common source of infection in humans, along with unpasteurized milk or other raw, insufficiently heated meat.
- ▶ Other sources of infection include contaminated drinking water, contact with pets (for example, dogs), or bathing in contaminated surface waters.

# Introduction (5)

- ▶ *Campylobacter* infections are considered a worldwide problem of economic burden and public health in US and EU.
- ▶ *Campylobacter* infection in human: sporadic and characterized by watery or bloody diarrhea (or both), abdominal cramps, and possible fever.
- ▶ *C. jejuni* is considered as one of the most common risk factors for developing Guillain-Barré syndrome (GBS) - the immune system attacks the body's nerves. Symptoms include muscle weakness, pain, tingling and loss of reflexes. *Campylobacter* infection leads up to 40% of GBS cases in the United States.



# Introduction (6)

- ▶ In Vietnam: Few data regarding *Campylobacter* infection in both animal and human.
- ❖ Difficult to culture
- ❖ Self-treatment of food poisoning cases.
- ▶ No syndrome of *Campylobacter* infection in chicken flock/farm, therefore the understanding of *Campylobacter* infection prevalence in farm/flock is necessary.

*In 2020, there were 153 food poisoning cases, killed 24 peoples and affected around 4,545 peoples*

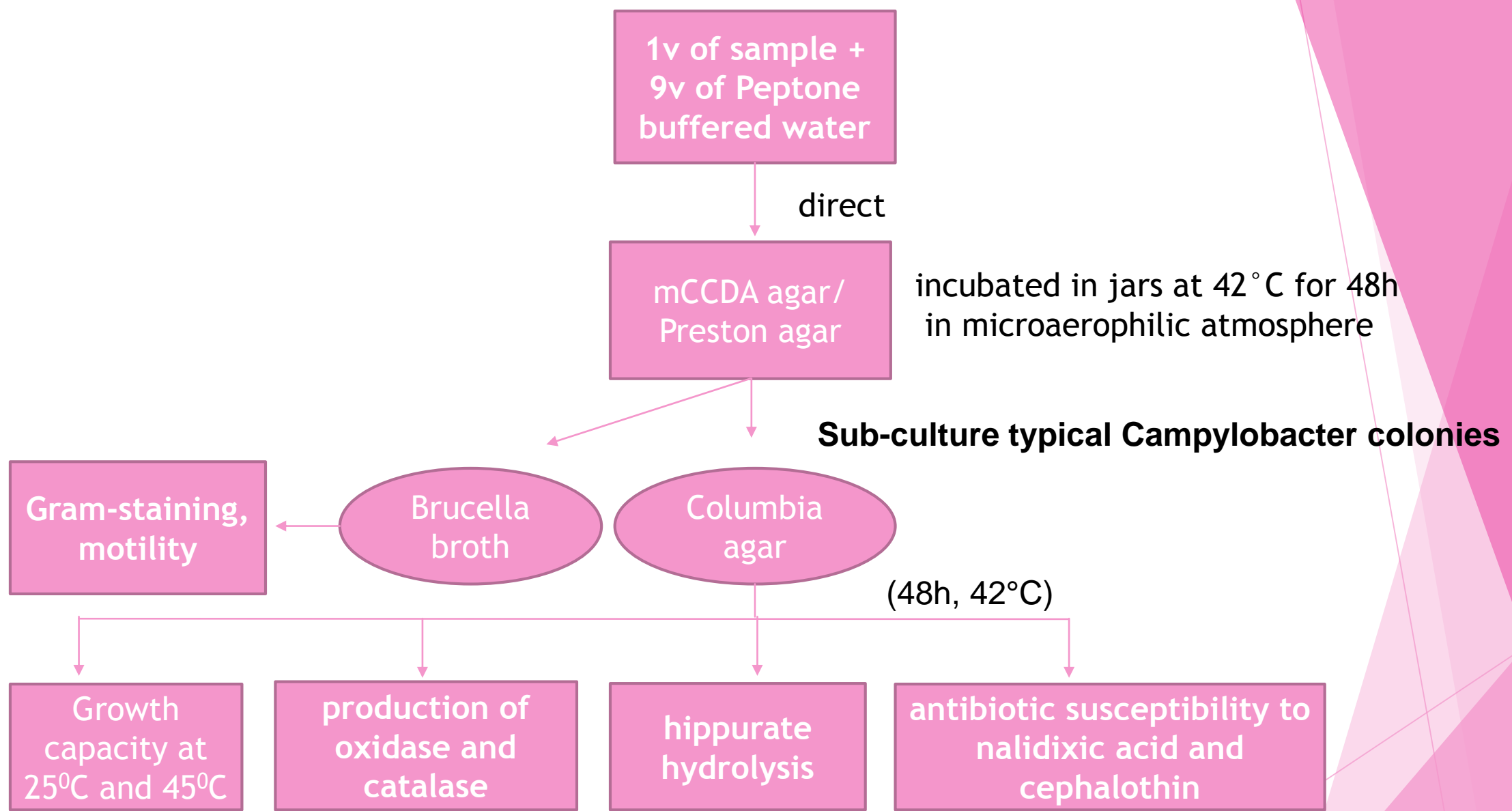
# Sampling

- ▶ Five different chicken feces were taken from five different sites in the flock and mixed as a pooled sample.
- ▶ Total of 200 pooled samples were collected from broiler chicken farms in Hai Phong province.



# Method

- ▶ Isolation and identification of *Campylobacter* according to ISO 10272-2017
- ▶ Antimicrobial susceptibility testing was performed by the Kirby-Bauer disc diffusion method in Muller-Hinton agar, according to the Clinical and Laboratory Standards Institute (CLSI) guidelines



# Results and discussions (1)

Table 1: Prevalence of *Campylobacter* spp. in chicken farm in Hai Phong province

TT	Sample	Number of sample	Positive with <i>Campylobacter</i>	Percentage
1	Chicken feces	200	160	80

Schets et al (Holland, 2017): *Campylobacter* isolated in 97% hen ceacum and 93% in broiler chickens ceacum.  
Marva et al (Germany, 2016): 90-100% chicken infected with *Campylobacter*  
Carique et al (Vietnam, 2014): 31,9% chicken feces in Mekong river infected with *Campylobacter*

# Results and discussions (2)

**Table 2. Identification of *Campylobacter* spp. isolated**

TT	Serotype	Campylobacter strains (n=160)	
		Number of strains	Percent (%)
1	<i>Campylobacter jejuni</i>	97	60,63
2	<i>Campylobacter coli</i>	52	32,5
3	Others	11	6,87
	<b>Total</b>	<b>160</b>	<b>100</b>

Schvan et al (Vietnam, 2010): 79% *C. jejuni* and 21% *C. coli*

Marwa et al (Germany, 2016): 43,76% *C. jejuni* and 56,33% *C. coli*

Schets et al (Holland,2017): 40% *C. jejuni* and 52% *C. coli* in hen and 100% *C. jejuni* in broiler chicken

# Results and Discussions (3)

Table 3: Antibiotic resistance of *Campylobacter jejuni* and *coli*

List	Antibiotics	Total ( $n = n_1 + n_2 = 149$ )		<i>Campylobacter jejuni</i> ( $n_1 = 97$ )		<i>Campylobacter coli</i> ( $n_2 = 52$ )	
		n	%	n	%	N	%
1	Amoxicilline	115/149	77,18	73/97	75,26	42/52	80,77
2	Erythromycin	76/149	51,0	49/97	50,52	27/52	51,92
3	Tetracycline	128/149	85,9	84/97	86,6	44/52	84,62
4	Gentamicin	85/149	57,05	55/97	56,7	30/52	57,69
5	Ciprofloxacin	118/149	79,2	78/97	80,41	40/52	76,92
6	Ampicilline	102/149	68,46	68/97	70,1	34/52	65,38

Angela et al, (Peru, 2017): Ciprofloxacin (88,7%)

Chon et al, (Korea, 2018): Ciprofloxacin (95,4% ), Tetracycline (72,5%) and Erythromycine (3,1%)



# Conclusion

- ▶ The prevalence of *Campylobacter* spp. in broiler chicken in Hai Phong province is high (80%; 60.63% *C. jejuni* and 32,5% *C. coli*).
- ▶ The highest rate of antibiotics resistance of *Campylobacter* spp. are Tetracycline, Ciprofloxacin and Amoxicilline.
- ▶ High resistance to antibiotic in Macrolides group (Erythromycin), which is used as a best choice for *Campylobacter* infection treatment reflect the negative effective of using veterinary antibiotic without control in animal husbandry in Vietnam. The Vietnamese government should pay much more attention.
- ▶ The majority of human *Campylobacter* infections are associated with the consumption of chicken meat. The prevention and control of *Campylobacter* (*coli* and *jejuni*) in broilers chicken would reduce the risk of human exposure to *Campylobacter* and it is an important food safety issue.



THANK  
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VERY  
MUCH  
FOR  
YOUR  
ATTENTION

