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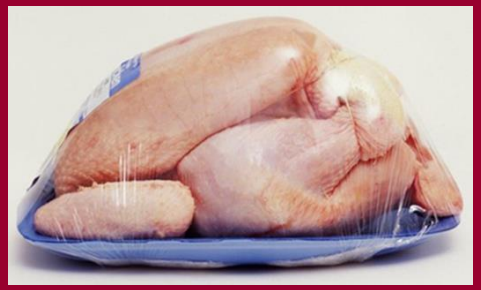
Agri-Food and Biosciences Institute

Food Standards Agency

Campylobacter jejuni and *C. coli* from fresh whole chicken at retail sale in the UK from 2014 to 2018



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Background

- Chicken meat incriminated as the key food-borne transmission route for *Campylobacter* spp. infection in UK

- The UK Food Standards Agency (FSA) agreed with industry to reduce *Campylobacter* spp. contamination in raw chicken; monitoring of chicken at retail sale was instigated and between from 2014 to 2018 ~ 15,000 chickens were tested

- Monitoring antimicrobial resistance in a proportion of the campylobacters recovered was an important part of the survey to help ascertain any impact of intervention in the broiler industry to reducing the prevalence AMR in broiler meat

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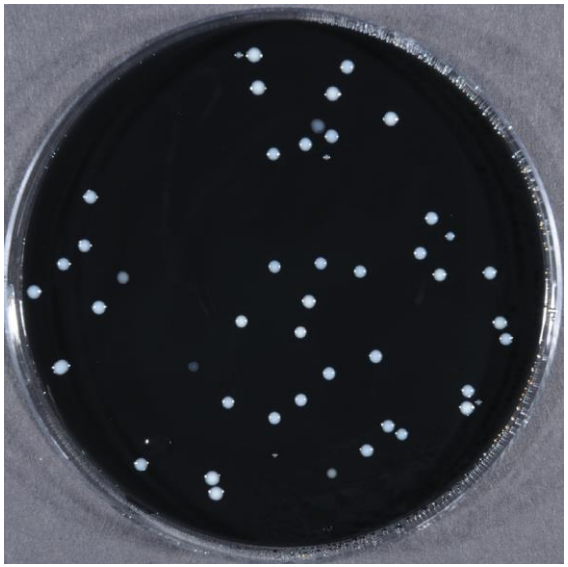
Method – enumeration according to ISO 10272-2; isolates obtained direct from mCCDA



- Samples reflecting a range of slaughterhouses
- AMR/WGS – selected isolates only - one colony pick for one chicken

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Level of contamination found

Year of sampling	cfu of *Campylobacter* spp. per gram of chicken skin sample			
	<10	10-99	100-1,000	>1,000
	%	%	%	%
2014-2015	26.7	22.5	31.4	19.5
2015-2016	40.1	23.5	25.8	10.6
2016-2017	46.1	27.7	20.4	5.9
2017-2018	41.8	25.6	23.6	9.0

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Multivariable model

Not significant:

- reared with outdoor access or not
- days of shelf-life left;

Variable	Multivariable analysis		
	OR	95 % CI	P-value
Slaughter House (compared to reference SH)			<0.0001
A	5.7	3.9-8.2	
B	3.5	2.6-4.8	
C	2.1	1.5-3.0	
D	2.0	1.3-3.1	
E	2.0	1.6-2.6	
F	1.7	1.2-2.3	
G	1.5	1.1-2.0	
H	1.5	1.2-2.0	
I	1.3	1.0-1.7	
J	1.0	0.8-1.3	
K	1 (reference)		
L	0.9	0.6-1.3	
M	0.7	0.5-1.0	
N	0.5	0.4-0.8	
Other or not known	2.4	1.9-3.1	
Weight of chicken			<0.0001
Medium *vs.* Small	1.2	1.0-1.4	
Large *vs.* Small	1.6	1.3-1.9	
Weight of neck-skin in sample			<0.0001
≥10 g *vs.* <10 g	1.7	1.5-2.1	
Year of testing			<0.0001
2015-16 *vs.* 2014-15	0.5	0.4-0.6	
2016-17 *vs.* 2014-15	0.3	0.3-0.4	
2017-18 *vs.* 2014-15	0.4	0.3-0.5	

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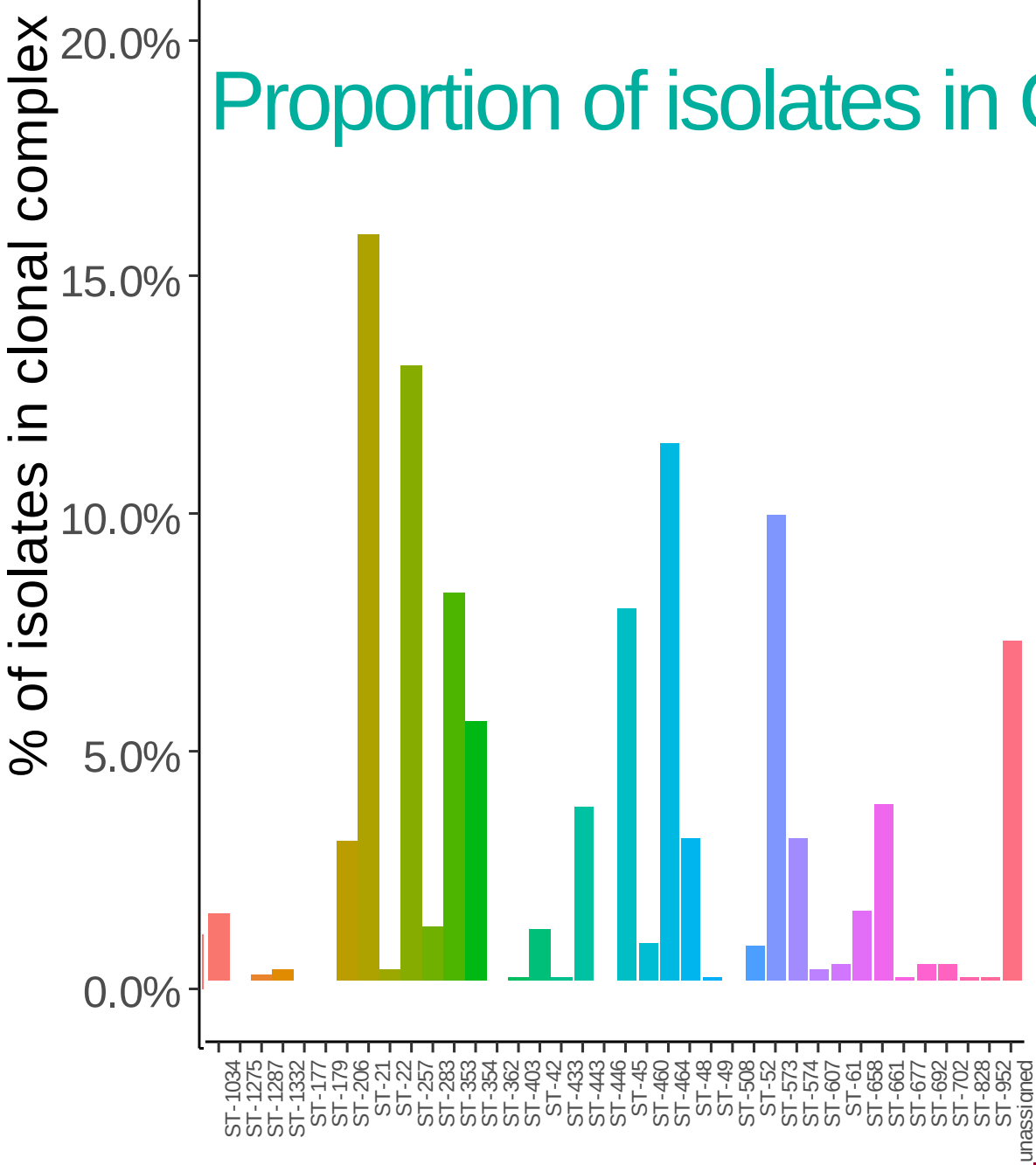
Proportion of isolates in CC ST



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Results

- *Campylobacter coli* was detected more frequently from birds with access to range (ie from free-range birds).

- A proportion of isolates (preliminary results) were subjected to WGS and the majority belonged to CCs ST-21, ST-257, ST-573, ST-464, ST-45, ST-353 and ST-354.

- In comparison to recent UK human cases CCs ST-206, ST-21, ST-403 and ST-48 were less and CCs ST-573, ST-257, ST-1034 and ST-574 were more common in this sample from UK retail chicken.

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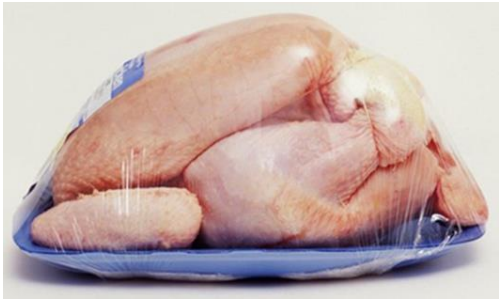
Discussion



The reporting rate for *Campylobacter* spp. cases decreased in England from 108.2 per 100,000 population in 2014 to 88.4 per 100,000 in 2016. However, the rate of reported Campylobacter infections started to increase again in 2017 to 103.7 per 100,000 population in 2018.

It is likely that a number of factors play a part - including changes in the relative importance of foodborne transmission routes, increased transmission from non-chicken sources and /or other factors including uncertainties in the ascertainment of the number of human cases and the proportion of cases that maybe travel-associated

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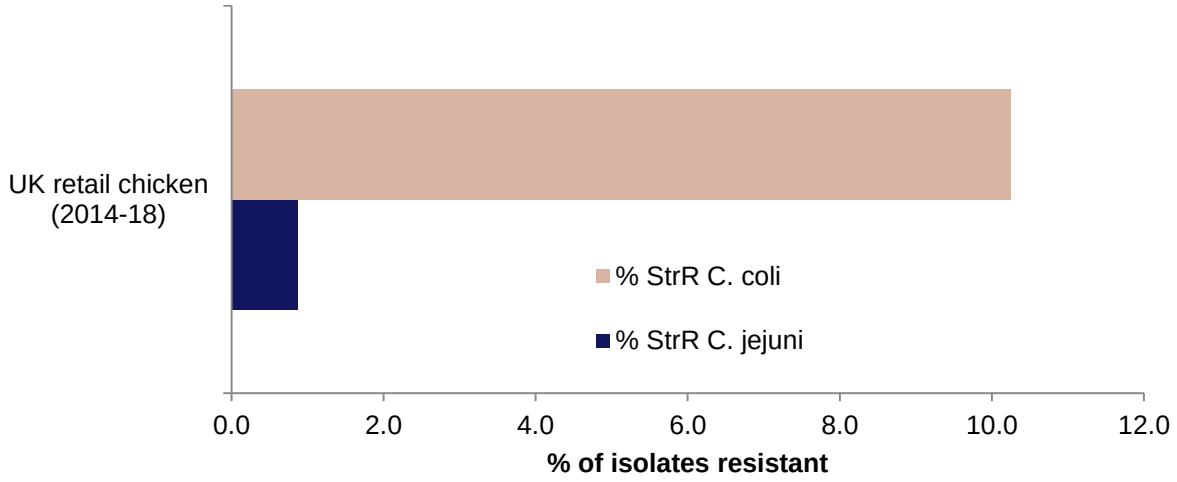
STR resistance



- The proportion of STR resistant isolates from UK human cases was similar in a sample from 2015-2018

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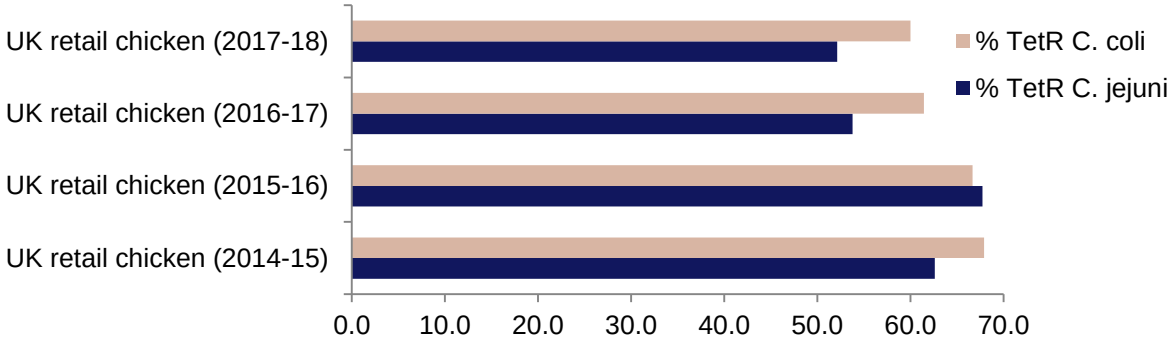
TET resistance



- No significant change in the proportion of TET resistant isolates from UK retail chicken from 2014 to 2018.

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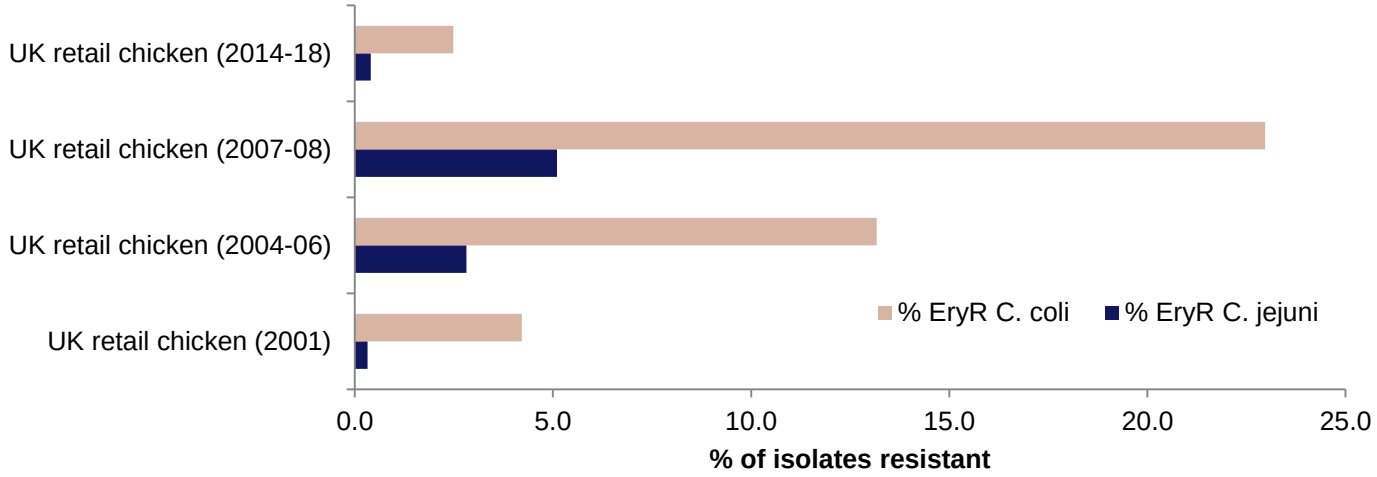
ERY resistance



- Increase in proportion of ERY resistant isolates from 2001 to 2007/08 then declining trend in isolates from UK fresh retail chicken

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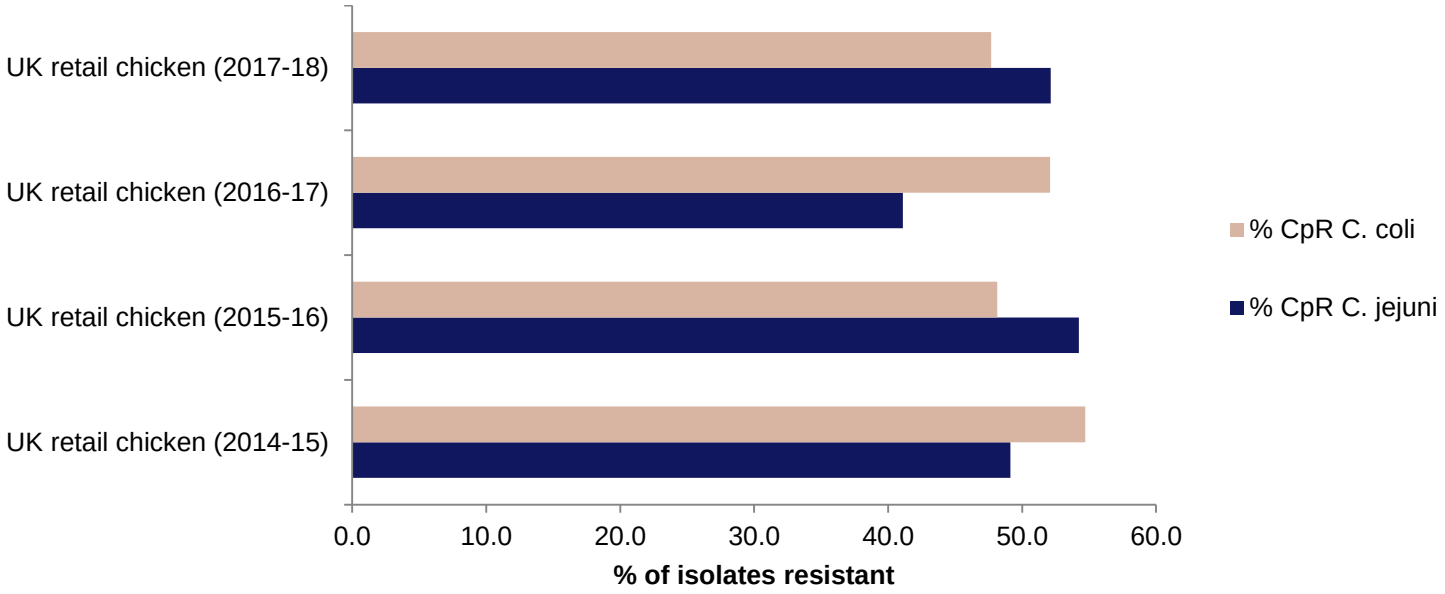
CIP resistance



No significant change in the proportion of CIP resistant isolates from UK retail chicken from 2014 to 2018.

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Results; Multi-drug resistance in *C. jejuni* and *C. coli* from UK retail chicken 2014-2018

Multiresistance pattern[a]				*C. coli*	*C. jejuni*
CIP/NAL	ERY	TET	STR	% of isolates	% of isolates
S	R	R	R	0.0	0.0
R	S	R	R	8.7[b]	0.7
R	R	S	R	0.0	0.0
R	R	R	S	0.6	0.3
R	R	R	R	0.3[c]	0.0
Any				**9.6**	**1.0**

[a]No resistance to gentamicin in any of *C. coli* or C. *jejuni* isolates tested. [b]6/6 isolates with this profile were ST828. [c]Isolate was ST1438

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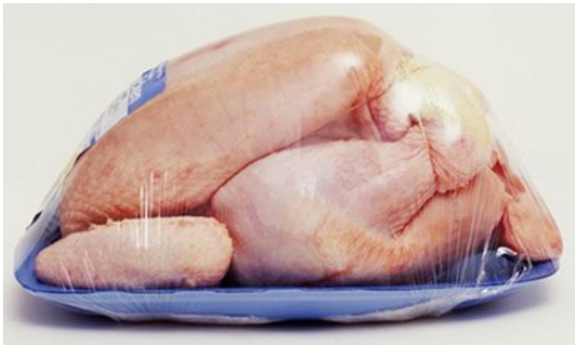
AMR outcomes



- Resistance to CIP/NAL and TET was common but resistance to ERY and STR much rarer. No resistance to gentamicin detected.
- The proportion of isolates with resistance to CIP did not change significantly between 2014-18
- Co-resistance to CIP/NAL and ERY was very low (0.3% in *C. jejuni* and 3.1% in *C. coli*).
- Preliminary work has found no high level (MIC) ERY resistance.
- A proportion of isolates were subjected to WGS; WGS predicted AMR matched phenotypic breakpoint AMR profile to a very high degree

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Thank you for listening and thank you to….

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