

# **A microbiological survey of campylobacter contamination in fresh whole UK produced chilled chickens at retail sale – an interim report to cover Quarters 1 & 2**

## **Background to the survey**

The Food Standards Agency has a key role in preventing foodborne illnesses. The Strategic Plan 2010-2015 aims to reduce foodborne disease using a targeted approach and Campylobacter in chickens has been highlighted as a key area. Foodborne Campylobacter makes more than 280,000 people ill each year in the UK and is the biggest cause of food poisoning. An EFSA Opinion<sup>1</sup> stated that up to 80% of cases can be attributed to raw poultry meat and a tenfold decrease in the exposure levels from this source is likely to reduce the number of human Campylobacter cases by between 50 to 90% across all Member States.

This UK-wide survey was established to review the levels of Campylobacter on fresh whole retail chickens and their packaging, testing from February 2014 to February 2015. The survey will test 4,000 samples of whole chickens bought from a range of UK retail outlets.

The packaging of raw chicken has also been implicated as a source of infection. However, published data lack critical information on the levels detected on outer packaging and it is not known how levels on the outer packaging relate to levels on the chicken it contains. The presence of Campylobacter on the outer packaging of chicken packs has raised concern as consumers would not expect products to be contaminated on the outside and no specific instructions are provided with regard to the safe handling of such packaging before opening.

## **Methodology**

Samples were collected from retail premises in the UK and information gathered included temperature on receipt, approved premises code and use-by dates.

Chickens sampled were:

- Whole, chilled, raw, UK-produced standard, free range or organic chickens;
- Where contained in a package, it was unopened and undamaged;
- NOT frozen;
- NOT basted, herbed, stuffed, marinated or otherwise modified.

Chickens were sampled according to a sampling plan aimed at reflecting market share (Kantar 2010). A total of 1995 samples was taken over the first two quarters.

The testing laboratories were the five Public Health England Food, Water and Environmental Microbiology Laboratories, plus the Agri-Food Biosciences Institute Laboratory in Northern Ireland. Once samples reached the laboratory, testing was usually initiated within 24 hours, and certainly before 48 hours after sampling. Chickens were tested before or on their use-by dates. Handlers prevented cross contamination between samples and from the

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<sup>1</sup> Scientific Opinion on *Campylobacter* in broiler meat production: control options and performance objectives and/or targets at different stages of the food chain: <http://www.efsa.europa.eu/en/efsajournal/doc/2105.pdf>

surrounding environment at all stages, e.g. by wearing gloves and changing them between handling each chicken, and the cleaning of equipment and work surfaces regularly.

Two samples for each chicken were analysed; one sample consisting of 25 g skin (mainly neck-skin), and one sample representing the outer packaging (prepared by examining a sponge swab rubbed over the entire outer packaging of the chicken).

The chickens samples tested were examined using an enumeration method based on ISO/TS 10272-2:2006 Microbiology of food and animal feeding stuffs -- Horizontal method for detection and enumeration of *Campylobacter* spp. -- Part 2: Colony-count technique. Enumeration using direct plating with a detection limit of ten colony forming units (cfu) per gram (g) of neck-skin, or per swab sample, was used.

Any isolates of *Campylobacter* species were sent to the Public Health England laboratory in Colindale for further speciation.

## Results

The table and figure below show the cumulative results to date by retailer. The overall prevalence of *Campylobacter* has been given as a percentage, as well as those levels over 1000 cfu/g. We have focussed on 1000 cfu/g, as together with the industry, we have a joint target to reduce the prevalence of these most contaminated chickens (greater than 1000 cfu/g) to below 10% at the end of the slaughter process by the end of 2015. It is thought that chickens with this level of *Campylobacter* contamination are the most likely to infect consumers.

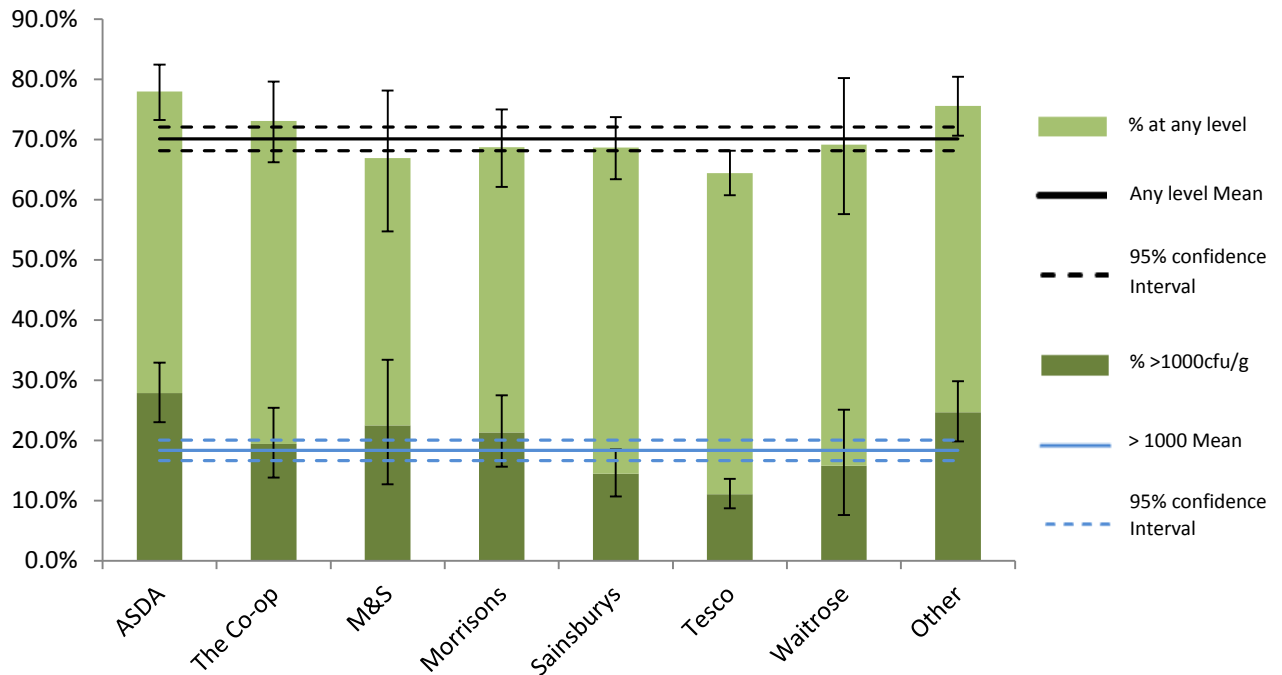
### Results by retailer

**Table 1** Overall prevalence of *Campylobacter* on chickens sampled in Q1 and Q2; the number of chickens that had levels of over 1000 cfu/g of *Campylobacter*; and the prevalence of *Campylobacter* on the outside of the chicken packaging, for each of the main retailers.

Retailer	No. of samples	% skin samples positive for <i>Campylobacter</i> (95% confidence interval)	% skin samples >1000 cfu/g <i>Campylobacter</i> (95% confidence interval)	% pack samples positive for <i>Campylobacter</i> (95% confidence interval)
Asda	312	78 (73 – 82)	28 (23 – 33)	12 (8 – 15)
Co-op	171	73 (66 – 80)	19 (14 – 25)	5 (2 – 9)
M&S	68	67 (55 – 78)	22 (13 – 33)	4 (0 – 10)
Morrison's	179	69 (62 – 75)	21 (16 – 28)	9 (5 – 14)
Sainsbury's	300	69 (63 – 74)	14 (11 – 19)	3 (1 – 6)
Tesco	607	64 (61 – 68)	11 (9 – 14)	3 (2 – 4)
Waitrose	70	69 (58 – 80)	16 (8 – 25)	9 (3 – 18)
Others*	288	76 (71 – 80)	25 (20 – 30)	7 (4 – 10)
<b>Total</b>	<b>1995</b>	<b>70 (68 – 72)</b>	<b>18 (17 – 20)</b>	<b>6 (5 – 7)</b>

\*The 'Others' category includes supermarkets where the market share was deemed small using the 2010 Kantar data, i.e. Lidl, Aldi, Iceland, plus convenience stores, independents, butchers etc.

95% confidence intervals means that we would expect the true prevalence to fall within the lower and upper confidence limits 95% of the time



**Figure 1** The overall Campylobacter prevalence (light green bars) and the % of chickens with levels over 1000 cfu/g of Campylobacter (dark green bars), for each of the main retailers (with 95% confidence intervals). The graph also shows the mean overall prevalence and the mean level >1000 cfu/g (solid lines), with 95% confidence intervals (dashed lines).

### Aggregate results

The tables below show the cumulative results to date by separate bands of contamination found on skin and packaging.

**Table 2** The different bandings of levels of Campylobacter (cfu/g) for the samples of chicken skin:

Chicken Skin	cfu/g			
	<10	10-99	100-1000	>1000
<b>*Weighted % (95% confidence interval)</b>	30 (28 - 32)	21 (19 - 22)	31 (29 - 33)	18 (17 - 20)
<b>No. samples</b>	579	416	630	369

Figures calculated from 1995 samples collected (1 of these samples was not tested).

**Table 3** The different bandings of levels of Campylobacter (cfu/swab) for the samples of chicken packaging:

Chicken Packaging	cfu/swab			
	<10	10-99	100-1000	>1000
*Weighted % (95% confidence interval)	94 (93 - 95)	5 (4 - 6)	1 (1 - 2)	0 (0 - 0)
No. samples	1868	96	19	1

Figures calculated from 1991 samples collected (7 of these samples were not tested).

\* A weighted percentage has been used to equalise the number of samples taken in each of the two quarters.

#### Notes

- The survey has been designed to get a robust estimate of the typical UK prevalence of Campylobacter in whole fresh chicken, averaged across a full 12-month period.
- The survey is to be used as a baseline against which to assess future Campylobacter prevalence. Publication of interim results will encourage retailers with their commitments to interventions to reduce Campylobacter.
- Retailers are represented in the survey in proportion to their estimated market share; the survey is not necessarily optimal for secondary objectives such as comparing prevalence among retailers or between different types of chicken, e.g. free-range vs housed.
- For the 7 main retailers, the survey was designed to return individual sample sizes that reflected their respective market share. All “other” retailers were pooled into a single group, with sampling of independent butchers approximately reflecting their market share.
- Once fieldwork had started, it was not possible to alter the survey design appropriately to take account of ‘emerging retailers’ who had increased their market share.
- No conclusion can be made about an individual retailer that is not named, either positive or negative.
- Confidence limits are a reflection of sample size, thus retailers with a lower market share will exhibit wider confidence intervals for total prevalence.
- It is not possible to separate any meaningful data in relation to the various countries of the UK owing to the nature of production and retail distribution.
- The lowest band <10 cfu effectively means that the level of Campylobacter is so low that tests cannot detect it. A significant proportion of the results for the swabs of the outside of the packaging are in this band. It aids interpretation of the data if we are

able to distinguish between levels of Campylobacter that are low, but still detectable (10-99 cfu), and those that are so low that we can't detect them (<10 cfu).

- To enable a fair comparison, some re-weighting of the data has been required to counter the uneven sampling across quarters. This will ensure that the overall prevalence for Campylobacter takes into account the seasonal effects in the correct proportions.
- The prevalence has increased in Q2, most probably due to the expected higher prevalence in the summer months due to the seasonal nature of Campylobacter.
- The FSA is planning a follow-up survey and is considering a slightly altered design that will offer more precise comparison of retailers, whilst only slightly lowering precision for estimating the UK average.

## **Conclusions**

This report only shows results from the first two quarters of a year-long survey, therefore, readers must exercise caution in their interpretation of these results. Overall prevalence of Campylobacter, and results for each of the retailers, will undoubtedly change with the next quarter's results, due to be published in the first quarter of 2015.

Similarly, the samples on which this report is written were taken within the period February 2014 – August 2014, and so more recent interventions that retailers and processors have introduced may not be reflected in these results.

That said, conclusions that can be drawn from the results we have to date, show that Tesco is the only one of the main retailers which had a lower incidence of chicken contaminated with Campylobacter at the highest level (>1000 cfu/g), compared to the industry average. Asda is the only main retailer which had a higher incidence of chicken that is contaminated by Campylobacter at the highest level, compared to the industry average. However, none of the retailers is achieving the joint industry end-of-production target for reducing Campylobacter.

All chickens, no matter which retail outlet they are sold from, are at risk of being contaminated with Campylobacter, which is why it is important for consumers to handle and cook their chicken safely. Effective cooking will kill any Campylobacter on the chicken.