



A UK WIDE MICROBIOLOGICAL SURVEY OF
CAMPYLOBACTER CONTAMINATION IN FRESH
WHOLE CHILLED CHICKENS AT RETAIL SALE
(Year 2/ 3/ 4)

PROTOCOL
Revised July 2015

CONTENTS

	Page
ABBREVIATIONS	3
OUTLINE	4
▪ Background	4
▪ Objective	6
▪ Publication of results	6
▪ Timetable	6
SURVEY DESIGN	7
SAMPLING	9
▪ Sample collection	9
▪ Sample information	10
TESTING	11
▪ Receipt of samples	11
▪ Examination	11
▪ Methodology	12
▪ Data handling and reporting	12
▪ Quality assurance	13
ANNEXES	14
1. Timetable	14
2. Letters to Retailers	16
3. Sampling Plan	17
4. Sampling Form	20
5. Model Data Submission Template	21
6. Laboratory Methodology	22

ABBREVIATIONS

CCDA-	Charcoal Cefoperazone Deoxycholate Agar
DH -	Department of Health
FSA -	Food Standards Agency
h -	Hour(s)
PHE -	Public Health England
ISO-	International Standards Organisation
LGP-	Laboratory of Gastrointestinal Pathogens
mL -	Millilitres
mm -	Millimetres
s -	Seconds
MS-	Microbiological Services
UKAS-	United Kingdom Accreditation Service

OUTLINE

Background

1. The Food Standards Agency has a key role in preventing foodborne illnesses. The Strategic Plan aims to reduce foodborne disease further and has set a target to reduce *Campylobacter* contamination in raw chicken.

Campylobacter is the most prominent bacterium associated with foodborne disease within the United Kingdom. Foodborne *Campylobacter* is estimated to make more than 280,000 people ill each year in the UK and is the biggest cause of food poisoning. An EFSA Opinion¹ stated that up to 80% of cases can be attributed to raw poultry meat. It is hoped that by reducing the number of highly positive birds through effective control programmes, the number of human cases will decrease.

2. In 2009 the FSA published results of its UK survey of *Campylobacter* and *Salmonella* contamination of fresh chicken at retail sale², this survey found the prevalence of *Campylobacter* in chicken at retail in the UK was 65.2% based on the combining of results from the direct plating and enrichment methods. This survey also highlighted the difficulties in isolating the organism and that the presence/absence method had limitations. Literature suggests that using a combination of presence/absence and enumeration testing provides a more robust measure of *Campylobacter* prevalence. The overall prevalence figure for the survey was therefore determined by combining the *Campylobacter* positive results from the 927 samples tested by both presence/absence and enumeration methods.
3. In December 2010 The Food Standards Agency, the UK poultry industry and major retailers agreed a new target that will measure efforts to reduce the levels of *Campylobacter* in chickens at the end of slaughter. There are three categories of contamination levels and, currently, 19% of birds are in the highest category (>1000 cfu/g)³. The target is for the industry to reduce the numbers of these most

¹ 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>

² Food Standards Agency.2009. UK-wide survey of *Campylobacter* and *Salmonella* contamination of fresh chicken at retail sale, Food Standards Agency, London.
http://www.foodbase.org.uk/admintools/reportdocuments/351-1-676_B18025.pdf

³ <http://www.food.gov.uk/sites/default/files/full-campy-survey-report.pdf>

contaminated birds in UK poultry houses from 27 to 10 % by the end of December 2015. It is estimated that achievement of this target could mean a reduction in Campylobacter food poisoning of up to 50 %. While this target might not be achieved in the timeframe, a significant decline in the Campylobacter levels on whole chickens towards the end of 2015 is expected.

4. In 2014, a UK-wide survey was established to review the levels of Campylobacter on fresh whole retail chickens and also on their packaging. The intention of the survey was to represent a full 12 month period (mid-February 2014 – mid February 2015) and tested a total of 4,011 samples of whole, UK-produced, fresh chicken. Over 19% of the chickens tested were found to contain Campylobacter at a level above 1000 cfu/g. Just under 73% were positive for Campylobacter at any level (i.e. were found to contain Campylobacter at a level above the detectable limit of 10 cfu/g). Just under 7% of the samples were positive for Campylobacter on the outer packaging (i.e. contained Campylobacter at a level above the detectable limit of 10 cfu/g). For 5 out of the 4,005 samples (for which valid results were available for the outer packaging), the level on the outer packaging was found to be above 1000 cfu/g. While a reduction of the most contaminated chickens to the target level of 10% may not be achieved by the end of December 2015, the evidence from retailer trials show promising results that interventions work.
5. This new survey will extend the Year 1 survey for up to an additional 36 months, including yearly breakpoints, and will investigate the prevalence and levels of Campylobacter contamination in fresh whole chilled chickens and on the outside surface of the packaging at retail using the enumeration method, and will provide valuable information on Campylobacter levels post slaughter. Although the survey will take into consideration seasonal fluctuations in Campylobacter prevalence in retail chickens, this is secondary to the surveys primary function to analyse prevalence among retailers. To draw any definitive conclusions regarding seasonality, we will require data from a number of separate years. The continuation of the retail survey for up to another 36 month additionally intends to identify trends as a result of specific retailer initiatives, such as improvements in biosecurity on farm or processing interventions, which among others, include SonoSteam (a technology combining steam and ultrasound to achieve rapid decontamination of food products such as chicken).

Objectives

- A. To determine the prevalence and levels of *Campylobacter* spp. contamination on fresh whole chilled chickens produced in the UK and sold at UK retail outlets by sampling up to a 36 month period, including annual breakpoints.
- B. To determine the prevalence and levels of *Campylobacter* spp. contamination found on the outside packaging of samples collected under Objective 1.
- C. To identify *Campylobacter* spp. present and determine susceptibility of an agreed percentage of isolates to a defined range of antimicrobial agents.
- D. To collect information from each sample on a range of factors including bird weight, rearing method and type of packaging and determine any correlation with *Campylobacter* contamination.

Publication of results

6. The survey results will be published under the Code of Practice for Official Statistics. This entails restricted access to raw data and pre-release publication documents.

At the end of the survey, the results and all the information that has been collected about all of the samples taken for the whole survey period will be published on the Agency's website.

In addition, sample data and results will be reported within four weeks following the end of a sampling month, and each quarter the Agency will publish an interim report (please see Annex 1 for proposed timeline).

Timetable

7. The survey will consist of a 12 month sampling period plus a further 2 months for data analysis and report preparation. The proposed timetable is available in Annex 1.

SURVEY DESIGN

8. Based on information available, the UK core sample per 12 month period will be 4000 samples. These samples will be taken evenly over a 12-month period unless agreed otherwise with the FSA to address additional objectives.
9. The survey design has been modified to increase statistical confidence in the determination of differences in *Campylobacter* prevalence among retailers. Therefore the aim is to sample an equal number of chickens (100) from each of the main retailers each quarter. This new design, informed by the knowledge gained during the Year 1 baseline study, increases statistical confidence in the validity of results obtained during the rest of the survey. It also enables to report earlier, more robustly, and with greater confidence, on any improvements which are observed in samples from individual retailers. The market share data will be applied to re-weight the dataset when producing annual estimates of the average prevalence of *Campylobacter* within the UK market.

Based on more recent market share data (purchased from Kantar in February 2015), the number of retailers to be named has been increased by adding Aldi and Lidl to the list of retailers named in Year 1.

10. The contractor will be responsible for ensuring that the appropriate number of samples is collected in accordance with the sampling plan agreed with the FSA. The number of chickens to be sampled from each UK country will be proportional to retailer market share figures of the respective country. If any deviations are necessary these will be noted in the final report. The contractor will ensure that sampling is evenly distributed throughout the period of the survey and is responsible for selecting and collecting samples at random within these criteria. If possible and in agreement between the contractor and the Agency, a maximum of 4 different chicken types (e.g. different size, brand or rearing) will be collected from any one store on any one occasion; the number of samples collected should be reduced if the sampler is unable to collect 4 different chicken types. A maximum of 2 samples should be taken from butchers and smaller independent stores/grocers at any one time.
11. The aim of this survey is to obtain a total of 4000 samples of whole UK produced raw fresh chilled chicken within any 12 month period. Sample numbers should be reviewed every month to ensure that chickens are being sampled according to the agreed sampling plan.

12. The contractor will provide smaller independent retail outlets with a letter from the Agency informing them that samples have been taken from their premises in order to carry out a survey (Annex 2). For larger retail chains (i.e. Tesco, Asda, Sainsbury's etc.) this is not necessary, as the relevant contact at head office will be sent a list of the premises from which samples have been obtained by the Agency.

SAMPLING

Sample collection

13. It is essential that cross-contamination be avoided during the collection of chicken samples. Precautions will therefore be taken at all stages to ensure that the equipment used during sampling, transport and storage is not contaminated with the pathogens investigated in the survey.
14. Contractors will aim to collect samples at random from the refrigerator cabinet and not necessarily from the front of the display. The surface temperature of the chicken should be recorded using an appropriately calibrated Infra-red thermometer, as should information on whether it was displayed in a temperature-controlled environment e.g. chillers and the overall condition of shelving e.g. was there any visible meat juices on the shelf.

Only packaged whole fresh chilled UK produced birds should be purchased. Unwrapped chickens may be bought but it should be noted on the sampling form and if available, with an indication of the Use-by Date. Samples, which are packaged, must not show evidence of damage. Each sample then should be placed in a separate sampling bag to avoid the risk of cross-contamination during transport and until testing can take place. For chickens collected from retail premises, the sample should not be purchased if the label on the chicken is not clear, does not include the approval number of the slaughterhouse, or is damaged. Chickens from butchers without labels may be sampled only if approval code can be obtained and must be noted down.

15. **Only unseasoned, fresh whole UK produced chilled whole chickens** should be sampled.

The chickens sampled may be labeled such as: Whole fresh chilled pre-packed UK-produced chicken and may include ones named as "Standard", "Value", "Ex Large", "Large", "Medium", "Roaster", "Small", "Barn-reared", "Free-range", "Roast-in-bag" etc.

Samples NOT included are:

- **Frozen whole chickens, portions (whether fresh or frozen) including legs, breast, thigh and wing portions.**
- **Any ready basted, marinated, seasoned, herbed, stuffed or pre-prepared whole birds.**
- **Cooked chickens.**

- **Processed chicken products including goujons, nuggets etc..**

16. Standard produced chickens will be sampled as well as a smaller number of free range and organic chickens (sampling of free range and organic chickens is structured to reflect their market share as outlined in Annex 3). A range of chicken weights will be sampled and weights should be noted down and logged in a separate column of the sample detail spreadsheet. Each sample should, at the point of sampling, have at least 2 days remaining on its Use-by Date.
17. When chilled un-packaged chicken is purchased from butchers/independents the sampling officer may need to enquire about the country of origin; if the bird is/or may not be UK-produced it should not be included in the survey. The sampler should ask the butcher for the approval number which should be present on the bulk packaging. Only samples where approval code can be obtained are to be included in the survey.
18. Each sample should be placed in a plastic bag, which is then sealed. Contractors will ensure that samples are kept at between 1 to 8 °C ($\pm 1^\circ\text{C}$) during transportation and kept dry and out of direct sunlight. A data logger should be placed (not in contact with or close to the cool pack) with the samples to monitor compliance with these requirements. If cool packs are used, samples shall not come into direct contact with their surfaces. Samples should not be frozen. Internal air temperature of the temperature controlled unit and package integrity shall be recorded on receipt at the laboratory.
19. It is essential to identify the approval number (used to be known as the health mark) from each sample so that the origin of the chicken can be determined retrospectively.

Sample information

20. All relevant information available from the sample should be recorded on the sample submission form (Annex 4). As far as possible this information should include the name (please ensure consistency throughout all laboratories) and postcode of the retailer, date and time of purchase, the approval number, weight (in a separate column), use-by date, price, product name, packaging information and display temperature. The sampling sheet is completed with the addition of the results from the microbiological testing. This data are then entered onto a spreadsheet compatible with Microsoft Excel (please see Annex 5 for model spreadsheet with required information).

21. Sampling and results should be reviewed every month to ensure that the chickens sampled could generate statistically valid/meaningful results. The samplers should co-ordinate their sampling with the testing laboratory, project manager and the Agency.

TESTING

Receipt of samples

22. On receipt of the samples, laboratories will check the information recorded by the sampler and complete the relevant sections of the laboratory sample submission form. The information will be entered into the Laboratory Information Management System and transferred from there into a spreadsheet compatible with Microsoft Excel or entered directly onto an Excel sheet. Following examination, the product label itself will be removed and stored if intact and readable.
23. Product information will be captured with digital photographs of each chicken in its packaging and the file will be stored and labelled with the appropriate sample number. Photos or scans are to be stored on suitable digital media under the appropriate sample number separated by sampling months. This will be shared with the Agency via Dropbox or other resources. The scan/photograph will be of a high resolution so that all the relevant labelling details are clear. Following examination, the product label itself shall be removed, cleaned and stored if intact and readable.
24. Chickens sampled should reach the laboratory within 24 hours of sampling. In exceptional situations (e.g. long journeys from the Northern Scottish Isles) this period may be extended to within 48 hours; if the transport period was 48 hours from sampling, the sampler must instruct the laboratory to test on receipt. All samples should always be tested before/on their use-by dates.

Examination

25. Samples of chicken will be examined to ensure that the packaging is intact before testing. If packaging has been damaged during transportation this should be noted on the sampling form before testing. The temperature of the samples will also be recorded on receipt. Satisfactory samples will consider the integrity of packaging as well as sample temperature on receipt and only samples deemed satisfactory on receipt will be considered eligible for testing. Satisfactory sample

receipt may be assigned if samples are within the temperature range of 1 to 8°C ($\pm 1^\circ\text{C}$). If the temperature data logger records temperatures below 1 °C at receipt, the temperature of the sample itself would be measured and if this temperature was below 1 °C the sample would only be assigned as satisfactory if the sample temperature was below 1 °C ($\pm 1^\circ\text{C}$) when collected. Similarly, if the temperature data logger records temperatures above 8 °C, the sample itself would be measured and only deemed acceptable if the temperature at receipt is equal to or lower ($\pm 1^\circ\text{C}$) than the temperature when sampled. Sample receipt procedures would also take into account temperature probe uncertainty and transport time. All samples will be delivered before their use-by date.

26. It is essential that handlers take care to avoid cross contamination between samples and between the chicken and its packaging as well as from the surrounding environment at all stages. Gloves must be worn and changed between each sample of chicken. The work-surface of the bench must be sanitised before unwrapping each chicken. Thorough cleaning of equipment and work surfaces will be undertaken regularly. There must be environmental sampling of the laboratory for test bacteria (*Campylobacter*) during the testing period at regular intervals. The contractor will carry out examinations in areas dedicated to the examination of survey samples and clearly separated from other potentially contaminated materials.

Methodology

27. The microbiological methodology for the testing of each sample (chicken and packaging) for *Campylobacter* is as follows:

The quantitative analysis of *Campylobacter* in a chicken sample will be based on the method described in **EN/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' (please see Annex 6 for detailed method).

Data handling and reporting

28. Within four weeks after each sampling month concludes, the contractor will submit to the Agency a progress report that provides details of the samples taken and the *Campylobacter* counts. The data for antimicrobial resistance profiles for strains isolated will be submitted independently in agreement with the Agency.

29. The contractor is responsible for collating all results and submitting a final report to the Agency. The report will present summary statistics on the prevalence of *Campylobacter*, together with a breakdown of the species where appropriate. The results should be subjected to detailed statistical analysis by the contractor; these analyses will be agreed with the Agency's Statistics team prior to commencement.
30. All forms, documentation and electronic files must be retained by the contractor until further notice from the Agency in case of issues arising after the completion of the survey. These should be retained for at least 12 months after completion of the current survey. It is not necessary to provide the Agency with hard copies of forms. However, this information must be readily available to the Agency if required.
31. Every month, the sampling numbers will be assessed to ensure that representative samples are being tested to obtain statistically valid/meaningful results. The contractor is responsible for adjusting the sampling plan every month according to any deviations occurring in the previous month(s) while the FSA is responsible for instructing the contractor on any major changes to the sampling strategy e.g. changes in market-share predictions.

Quality Assurance

32. In order to ensure a high level of accuracy in data entry, data checking and backup, the contractor has to be accredited to the relevant ISO methods by an appropriate organisation (e.g. UKAS). The EN/ISO/TS 10272-2 method is currently being revised to become a full standard and any proposed changes in the final draft may be incorporated providing they are within the scope of the accreditation. The contractor must also be able to demonstrate satisfactory performance in the testing of food for *Campylobacter* spp. through participation in an independent proficiency testing scheme. The measurement of uncertainty for enumeration of *Campylobacter* spp. must also be determined and the FSA will visit the contractors during the course of the survey to assess how the work is being carried out.

ANNEX 1: PROPOSED TIMETABLE FOR FIRST YEAR OF SURVEY

June 2015	Protocol finalised
June 2015	MoU signed
<i>Quarter 1 (sampling July/ August/ September)</i>	
Beginning July 2015* *covering the quarterly sampling months July/ August/ September	Sampling starts
31 August 2015	July sampling data and results to be submitted to Agency
30 September 2015	August sampling data and results to be submitted to Agency
15 October 2015	Agency to receive spreadsheet containing all sampling details for Quarter 1
4 November 2015	September results to be updated and submitted to Agency
26 November 2015	Anticipated Quarter 1 publication
<i>Quarter 2 (sampling October/ November/ December)</i>	
30 November 2015	October sampling data and results to be submitted to Agency
4 January 2016	November sampling data and results to be submitted to Agency
18 January 2016	Agency to receive spreadsheet containing all sampling details for Quarter 2
3 February 2016	December results to be updated submitted to Agency
25 February 2016	Anticipated Quarter 2 publication
<i>Quarter 3 (sampling January/ February/ March)</i>	
29 February 2016	January sampling data and results to be submitted to Agency
28 March 2016	February sampling data and results to be submitted to Agency
18 April 2016	Agency to receive spreadsheet containing all sampling details for Quarter 3
5 May 2016	March results to be updated submitted to Agency
26 May 2016	Anticipated Quarter 3 publication

Updated 07.07.2015

Quarter 4 (sampling April/ May/ June)	
30 May 2016	April sampling data and results to be submitted to Agency
30 June 2016	May sampling data and results to be submitted to Agency
16 July 2016	Agency to receive spreadsheet containing all sampling details for Quarter 4
3 August 2016	June results to be updated and submitted to Agency
25 August 2016	Anticipated Quarter 4 publication
1 July 2016	End of sampling period / annual breakpoint
5 September 2016	Final draft report received
29 September 2016	Final report signed off

ANNEX 2: LETTER TO RETAILERS

Letter to be sent to Retailers during Sampling

Insert Council Logo &/or Name
--

<Date>

Dear

This letter has been given to you by an Environmental Health Officer (EHO)/ Sampling Officer (SO) from [\[insert name of Contractor\]](#).

The EHO / SO is authorised by the [\[Contractor\]](#) to carry out food sampling work, and has purchased chicken from your premises as a food sample, which is to be used for a food surveillance survey.

The aim of this particular survey is to ascertain the incidence and contamination level of *Campylobacter* in raw UK produced chicken available to consumers at retail in the UK. Whole chickens are being sampled and tested during a 12 month period.

This survey is being funded by the Food Standards Agency which has commissioned [\[name of Contractor\]](#) to carry out the sampling.

Your premise has been visited as one of the retail outlets where people may buy raw chicken - the subject of this survey. The raw chicken purchased from your premises will be taken to [\[insert name of lab\]](#) for testing, and you will be provided with the results of this testing by a letter from the Food Standards Agency. Please note that the survey is not for enforcement purposes.

The results of the samples taken in this survey will be collated and will form part of a report on the incidence and contamination level of the pathogen *Campylobacter* spp. on the surface of the packaging and in fresh whole chilled UK chicken on retail sale within the UK. This report will be published by the Food Standards Agency. At the end of the survey, in line with Food Standards Agency policy on openness and transparency in relation to food safety and matters of interest to consumers relative to food, individual retailers/producers of the chicken sampled will be published on the Agency's website www.food.gov.uk as part of this report.

Should you have any queries, please contact Dr Bettina Mavrommatis, Foodborne Disease Control, Food Safety Policy on the following telephone number:

020 7276 8045 or send an E-mail to

Bettina.Mavrommatis@foodstandards.gsi.gov.uk**Yours sincerely****Updated 07.07.2015**

ANNEX 3: SAMPLING PLAN

A UK core sample size of approximately 4000 samples of fresh whole UK produced chilled chicken are needed to achieve the precision required. The sample numbers should be reviewed periodically to ensure that statistically meaningful analyses can be carried out.

The sampling will aim to take place evenly over a 12-month period. The sampling plan is structured to reflect market share data sourced from Kantar (February 2015). Sampling will be kept under review and can, as agreed with the FSA, be revised to accommodate any further survey objectives e.g. over-sample during certain periods.

Table 1 Numbers of chickens to be sampled throughout the UK over 12 month

	Total number of chickens
Total UK	4000
England	3250
Scotland	288
Wales	396
Northern Ireland	66

ENGLAND

Retailer groups	Total no. of chickens	No. of Free-range chickens (of total)	No. of Organic chickens (of total)
Tesco	314	30	1
Asda	321	40	1
Sainsbury's	340	28	5
The Co-operative	313	25	0
Morrisons	333	33	1
Waitrose	369	56	12
M&S	310	2	1
Aldi	313	43	0
Lidl	284	13	0
Butchers	186	*	*
Others ¹	167	66	0

¹E.g Iceland, Budgens, Costcutter, Nisa, independents, farm shops, markets stalls.

* samples from butchers can be collected from either category (Standard/ Free Range/ Organic) depending on availability

WALES

Retailer groups	Total no. of chickens	No. of Free-range chickens (of total)	No. of Organic chickens (of total)
Tesco	49	4	0
Asda	41	3	0
Sainsbury's	32	3	1
The Co-operative	38	4	0
Morrisons	33	3	0
Waitrose	25	6	0
M&S	34	3	1
Aldi	50	6	0
Lidl	66	2	0
Butchers	10	*	*
Others ¹	18	3	0

¹E.g Iceland, Budgens, Costcutter, Nisa, independents, farm shops, markets stalls.

* samples from butchers can be collected from either category (Standard/ Free Range/ Organic) depending on availability

SCOTLAND

Retailer groups	Total no. of chickens	No. of Free-range chickens (of total)	No. of Organic chickens (of total)
Tesco	26	5	0
Asda	25	3	0
Sainsbury's	13	1	0
The Co-operative	49	5	0
Morrisons	34	4	0
Waitrose	6	1	0
M&S	56	4	0
Aldi	37	3	0
Lidl	29	2	0
Butchers	4	*	*
Others ¹	9	2	

¹E.g Iceland, Budgens, Costcutter, Nisa, independents, farm shops, markets stalls.

* samples from butchers can be collected from either category (Standard/ Free Range/ Organic) depending on availability

NORTHERN IRELAND

Retailer groups	Total no. of chickens	No. of Free-range chickens (of total)	No. of Organic chickens (of total)
Tesco	11	1	0
Asda	13	2	0
Sainsbury's	15	1	0
The Co-operative	0	0	0
Morrisons	0	0	0
Waitrose	0	0	0
M&S	0	1	0
Aldi	0	0	0
Lidl	21	1	0
Butchers and Others*	6	2	0

*E.g Dunnes, Iceland, Budgens, Costcutter, Nisa, independents, farm shops, markets stalls.

ANNEX 4: SAMPLING FORM



FOOD WATER AND ENVIRONMENTAL MICROBIOLOGY LABORATORY, xxxxxx
 a UKAS accredited Testing Laboratory No. xxxxx
 Tel: 0xxxxxxx
 E-mail: LabFwxxxxx@phe.gov.uk



FSA Campylobacter in chickens 2015-2016

RETAILER: ALDI / ASDA / CO-OP / LIDL / M&S
 (circle which)

MORRISONS / SAINSBURYS

TESCO / WAITROSE / BUTCHERS*

OTHER*

Post Code:

*If BUTCHERS or OTHER give premises name and address:

AFFIX LABORATORY NUMBER HERE

Sampling done by (tick): PHE lab MH Scientific

CRCE N Ireland lab

Sender contact tel #

Cool Box ID:

Sample collected by: Date collected: Time collected (24 hour clock): Temperature at collection:°C

Sample Details
 Sample description (enter full name of product as it appears on the label)

Use by date: dd/mm/yyyy Batch Number / Approval Number:

Additional sample details: Enter answers to the questions and TICK ALL BOXES THAT APPLY

Q#	Question	Response
Q1	Display unit	Dry <input type="checkbox"/> Wet <input type="checkbox"/> Dirty and / or bloody <input type="checkbox"/>
Q2	Weight of product as shown on packaging Grams
Q3	Price	£.....
Q4	Type of chicken (as shown on packaging)	Standard <input type="checkbox"/> Free range <input type="checkbox"/> Organic <input type="checkbox"/> Choose Standard if type not stated
Q5	Other chicken details	Halal <input type="checkbox"/> Corn fed <input type="checkbox"/> Other <input type="checkbox"/> (give details):
Q6	Assurance scheme	Red Tractor <input type="checkbox"/> Other <input type="checkbox"/> (give details e.g. Freedom Foods):
Q7	Packaging details	Wrapped tight <input type="checkbox"/> Tray present <input type="checkbox"/> Modified atmosphere <input type="checkbox"/> Other (give details):
Q8	Visible liquid in pack?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Q9	Other sampling comments:	
Q10	For Lab Use Only	Weight of neck skin in sample Grams

LABORATORY USE ONLY (Record details of unsatisfactory findings in comments)

Date received:/...../..... Data logger / probe ID: Comments:
 Air / In between pack (delete as appropriate)
 Time received: Temp. on receipt:°C Associate with STARLIMS Study No.: ..
 Received by: Samples & Receipt: SATIS
 Received from: UNSATIS

ANNEX 5: Model data submission template (as Excel)

Country	NI lab ref	Post code	Sample Number	Temp at Collection (Store) °C	Temp on Receipt (Lab) °C	Date Examined	Retailer store	Retailer details (if Others/ Butchers)	Premises Address (Others/ butcher)	Sample Details	chicken weight (g)	Other Packaging Details	Other packaging comments	Chicken type	Specify other production types	Cost of chicken (£)	Approval Number	Use by date	breastskin taken for analysis (g)	Test Name	Result	Units	Speciation	Result	
	as before	as before	as before	please specify accurate (without characters)	please specify accurate (without characters)	consistent date format	consistency throughout			please specify here	number in gram without characters	please specify here	please specify here	specify consistently	specify if described by following	specify (number only; no characters)	specify (number only; no characters)	consistent date format	please specify breastskin taken for analysis (g)						
				5	6.2	12/08/2015	Co-op			Small whole chicken Fresh Class A	4269	Roast-in-bag	liquid visible in pack	STD	Halal	2.99	8005	12/08/2015							
							Asda					No tray, modified atmosphere packed		FR	cornfed										
							Morrisons					Tray present, modified atmosphere packed.		O											
							Sainsbury's					No tray. Plastic, lightly wrapped.													
							Tesco					Loose bag. No tray.													
							Lidl																		
							Waitrose																		
							Aldi																		
							M&S																		
							Others	NISA																	
								Iceland																	
								etc.																	
							Butchers	Pat The Butcher	1 Little Aston Lane, Little Aston, Birmingham																

ANNEX 6: LABORATORY METHODOLOGY

Overview

Chicken neck-skin samples and the outside surface of packaging will be analysed for *Campylobacter*. Wear suitable single-use gloves for handling the packaged chicken, changing gloves after each sample.

Outer packaging swab

Place the wrapped chicken, with the outer bag folded away from the pack label onto a clean surface and take a picture (with sample number and pack label clearly visible) and retain label after examination.

Add 10 ml of Maximum Recovery Diluent (MRD) to a SpongeSicle™ swab and ensure the swab is thoroughly wetted.

Remove the outer sample bag and place the wrapped chicken on a previously disinfected dry plastic tray wearing disposable gloves.

Swab the entire outer surface of the chicken packaging using aseptic technique (swab whole pack twice using both side of the swab). In case of 'Roast/ Cook in bag' chicken, which for some retailers can come double-bagged, swab the outer bag for enumeration.

Replace the swab in its bag breaking off the stick and then stomaching the swab for 30 s.

Using a sterile pastette remove > 2 ml into a sterile container for enumeration as described below.

Chicken skin

Wearing a fresh pair of disposable gloves, remove the chicken from its wrapping, taking care not to allow contact between the chicken and outer packaging. Using sterile instruments (e.g. scissors and tweezers) aseptically remove skin from the neck area (if < 25 g neck-skin is available top up with breast skin (**record weight of this**)) to make a 25 g test portion, avoiding fat and place this into a sterile bag.

Add 225 ml BPW and homogenise for one minute. Remove > 3 ml for enumeration as described below.

Enumeration of *Campylobacter* spp.

Enumerate *Campylobacter* spp. by the surface plate method as described in the PHE Methods - Detection and enumeration of *Campylobacter* spp.: *FNES15* (F21) v2 (see Appendix I). This method is based 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 and entails the following:

Plating of 1 ml of the packaging swab liquid onto three modified cefoperazone, charcoal deoxycholate agars (CCDA plates: e.g. Oxoid CM739 with Oxoid selective supplement SR155).

Plating of 1 ml of the chicken skin homogenate onto three CCDA plates and 100 µl onto duplicate CCDA plates. Prepare two further 10-fold dilutions in MRD and plate 100 µl of each of these in duplicate onto CCDA plates.

Incubate CCDA plates in a microaerophilic atmosphere at $41.5 \pm 1^\circ\text{C}$ for 44 ± 4 h.

Counting and confirmation of suspect/typical colonies

Count plates from those with less than 150 colonies, where possible. As the bacteria rapidly deteriorate in air progress confirmation of colonies immediately. Pick 5 (or less if less present) colonies (based on typical colony morphology) and sub-culture onto Columbia Blood Agar (containing 5 % (v/v) defibrinated blood). Check that growth is

Updated 07.07.2015

absent after incubation under aerobic conditions after 48 h and check for typical growth in a microaerophilic atmosphere at 41.5 °C. Confirm oxidase reaction of pure cultures and typical *Campylobacter* cell morphology (small, slim, curved or spiral, Gram-negative rods/motility (wet mount/phase contrast)). Commercially available latex agglutination test kits can be used to identify campylobacters (e.g. Microscreen® campylobacter (Microgen bioproducts) and Dryspot campylobacter test (Oxoid Ltd) consistent with local Standard Operating Procedures.

Isolates of *Campylobacter* spp. will be sent, as soon as possible, to the Gastrointestinal Bacteria Reference Unit (GBRU) CampyLab, PHE London (Hays DX number DX653008) for speciation and antibiotic resistance testing. One isolate from each positive sample will be sent and archived by GBRU. Isolates sent to GBRU must be clearly labelled with their sample number and the name of the referring laboratory.