# ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF)

# REPORT ON THE FIRST MEETING OF THE SURVEILLANCE WORKING GROUP

## Introduction

1. The Surveillance Working Group was set up to make it easier for the ACMSF to feed in, at an early stage, advice to Government on its microbiological food surveillance programme and on other foodborne disease-related surveillance. It was intended that the Group should provide input particularly in relation to the design, methodology, sampling and statistical aspects of surveillance projects.

2. The membership and terms of reference of the Group are given at **Annex A.**

3. At its first meeting, on 13 February 2001, the Group considered a draft protocol for a Food Standards Agency (FSA) chicken survey, and an FSA paper setting out some initial thoughts on a planned survey of UK hens' eggs. The Group also received a tabled FSA paper about establishing a baseline in connection with the Agency's foodborne disease target.

## FSA chicken survey

4. Dr Paul Cook (FSA) introduced a draft FSA protocol for a UK-wide survey of *Salmonella* and *Campylobacter* contamination of fresh and frozen chicken on retail sale (Annex B). A major objective of the survey is to provide baseline data against which the Agency can measure progress towards its target of reducing *Salmonella* contamination of retail UK chicken by 50% over the next 5 years. It is also important to track this food safety objective because of its possible relationship to the FSA's targeted food safety outcome of reducing foodborne disease by 20% by April 2006.

5. In its 1996 Report on Poultry Meat, the ACMSF concluded that there was no reason in principle why the prevalence of *Salmonella* contamination in finished raw chicken should not be reduced to a single figure percentage within the next few years, with the longer-term aim of effectively eliminating poultry meat as a source of *Salmonella* in the nation's food supply. Having also noted an apparent steady reduction in the overall prevalence of *Salmonella* in UK-produced, raw, retail chicken over the period since 1979, the ACMSF encouraged the Government to conduct further surveillance from time to time in order to be able to map progress towards the reduction and ultimate elimination of pathogens.

*General design, objectives and sampling plan*

6. The Surveillance Working Group considered the protocol in detail. The main points of discussion were :-

- Members advised that officials must acknowledge and place on the record the particular objectives, the strengths and the limitations of any particular protocol from the outset;

- Members pointed out that the protocol was appropriate only in terms of establishing baseline data against which future change could be measured. The number of samples tested would not provide an adequate basis for establishing the extent to which individual chickens/chicken portions were contaminated;

- bearing in mind that the objective of the survey was to establish baseline data, decisions should be taken in advance of the commencement of the survey on what analyses would be carried out on the results. Care should be taken to avoid undertaking any analysis which the data would not support;

- officials explained why they believed that the sampling plan should reflect every sector of the market in proportion to its market share. Members questioned this on the basis that these smaller elements of the market could have only limited impact on achieving the FSA target. And there were more serious concerns that the data may later be used to make comparisons of *Salmonella* contamination in chickens from different retail outlets or production systems despite the fact that the survey design acknowledges that such use of the data would be invalid. For this reason, Members strongly advised against inclusion of chickens from different production systems such as organic, free range, poulet jaune, etc;

- officials were advised to consider carefully whether alternative approaches to the sampling plan might achieve the same objectives more simply, for example, sampling at a predetermined number of sentinel sites, the use of grid reference-based sampling to avoid sampling bias, or adoption of a panel-based approach similar to the annual household panel surveys conducted by the Office for National Statistics;

- the possibility of the survey providing information on the seasonality of contamination was raised. The FSA pointed to there being little evidence of seasonality in relation to *Salmonella* contamination of finished chicken. The short timescale of the survey (commencement March/April2001; completion by end June 2001) did not enable consideration to be given to possible seasonality of

*Campylobacter* contamination. The difficulties were also noted of obtaining meaningful information about seasonality in relation to frozen birds.

*Sample collection*

- imports : Members questioned whether officials were confident that they would get sufficient information from product labels to identify imported chicken meat reliably, especially with respect to imported chicken cut and packed into portions in the UK. False attribution could confuse the results of the survey;

- Members recommended that it would be useful to record the temperature of samples at point of purchase, and on arrival at the laboratory, and also the time that had elapsed between sampling and arrival of samples at the laboratory.

*Microbiology and data handling*

- it was important that analysis should be carried out using validated methodologies, particularly in the context of the comparability of results from future surveys;

- it was felt that, if the aim was to identify all serotypes, then all 6 colonies should be tested ;

- to avoid possible confusion, clear guidance was required for laboratories on the data to be entered on the Microsoft Excel 97 Spreadsheet.

7. Surveillance Working Group Members were concerned that they should be able to see, in advance of the commencement of the survey, the intended use of data which would be generated. The FSA thought that, given the tight time frame, this would not be possible before the work commenced. However, the Working Group would be consulted prior to the analysis of data generated. Members reluctantly accepted the FSA's insistence that this could not now be done before the survey commenced but strongly emphasised the need to have this information as soon as possible and, in any event, before any data began to emerge from the survey.

8. Finally, the Working Group pointed to the fact that almost a year had passed since the target was set, and stressed the great importance of undertaking the work (including the required benchmarking exercise) and publishing the results with minimal further delay. The value of surveillance was greatly reduced unless projects were started promptly and results were available quickly following their completion.

**FSA eggs survey**

9. Following the ACMSF's call for Government-funded surveillance to assess whether the overall level of *Salmonella* contamination in UK hen's eggs has reduced since the 1995/96 survey, and to compare eggs from vaccinated flocks with eggs from flocks where control measures do not include vaccination, Ms Geraldine Hoad and Dr Jonathan Back (FSA) introduced a paper (Annex C) setting out the Agency's initial thoughts on key objectives, coverage, sample collection, methodology, and other logistical matters. The following points emerged from discussion :-

- the Working Group accepted that, to facilitate identification of eggs from vaccinated flocks and eggs from unvaccinated flocks, it was a sensible expedient to collect samples at egg packing stations rather than at retail. The possibility was being investigated of using the Egg Marketing Inspectorate to collect samples;

- the intention was to establish prevalence and not to enumerate salmonellas found;

- it was not proposed to try to differentiate between surface and internal contamination;

- given the current low prevalence of *Salmonella* contamination of eggs, the FSA sought the Group's views on the acceptability of the survey aiming to establish the level of contamination in "less than" terms (eg <1 in 5,000), rather than as an absolute number (eg. 1 in 600). The Group recommended that a further FSA paper should be prepared for its consideration setting out the costs and benefits of a range of sampling options;

- a 95% confidence interval seemed appropriate;

- the Working Group was strongly of the opinion that the limitations of the survey must be clearly identified from the outset;

- statistical advice should be obtained on the implications of pooling more than 6 eggs to obtain the sample to be tested;

- given the intention to sample at packing stations, eggs should be tested between 5 and 12 days from lay. This would mirror the spread of ages of eggs from the previous survey, where samples had been taken at retail;

- finally, on a more general point, the Group reiterated the importance of the relevant statutory agencies investigating egg-associated human *Salmonella* outbreaks very thoroughly to ensure that failure of control measures or the emergence of new sources, vehicles or modes of transmission are identified as soon as possible so that the need for additional preventive action is considered promptly.

**Foodborne disease target baseline**

10. An FSA paper (Annex D) was tabled putting forward a proposal for establishing the baseline for, and monitoring progress towards achieving, the Agency's target to reduce foodborne disease by 20% by April 2006. The views of, *inter alia*, the ACMSF were being invited prior to the proposal being put to the Board of the FSA. As the Surveillance Group had not had an opportunity to consider the paper in advance of its first meeting, written comments were invited by 6 March.

11. Individual Working Group members offered a number of detailed comments which were conveyed to the FSA and are summarised at Annex E.

**David Clarke**
**Surveillance Group Chairman**
**March 2001**

**ANNEX A**

**SURV/1**

**ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF)**

**SURVEILLANCE WORKING GROUP**

1. The ACMSF agreed, at its 37th meeting in June 2000, to set up a standing Surveillance Working Group to offer advice in connection with Government-funded microbiological food surveillance of animal and human infection.

**Terms of reference**

2. The Working Group's terms of reference are :-

To facilitate the provision of ACMSF advice to Government in connection with its microbiological food surveillance programme and other surveillance relevant to foodborne disease, particularly in relation to the design, methodology, sampling and statistical aspects; and to report back regularly to the ACMSF.

**Membership**

3. The membership of the Working Group is as follows :-

| | |
|---|---|
| Chairman | Mr David Clarke |
| Members | Mrs Patricia Jefford |
| | Mr Derrick Kilsby |
| | Professor Stephen Palmer |
| | Dr Terry Roberts |
| Secretariat | Mr Colin Mylchreest (Administrative Secretary) |
| | Ms Geraldine Hoad (Scientific Secretary) |
| | Mrs Liz Stretton (Secretariat) |
| | Miss Janice Kerr (Secretariat) |

4. The membership will have to be reviewed from 1 April 2001 to reflect the outcome of the 2000 Appointments Round.

**Secretariat**
**January 2001**

**ANNEX B**
**SURV/2**

**ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD (ACMSF)**

**SURVEILLANCE WORKING GROUP**

# FOOD STANDARDS AGENCY (FSA) SURVEY OF *SALMONELLA* AND *CAMPYLOBACTER* CONTAMINATION OF FRESH AND FROZEN RETAIL CHICKEN

## FSA targets

1. Among the targets announced by the FSA is one to reduce *Salmonella* contamination of retail UK chicken by 50% over the next 5 years. The Agency has also set a target of reducing the incidence of food poisoning by 20% over a 5 year period.

## ACMSF view of poultry meat

2. The ACMSF's Report on Poultry Meat was published in 1996. In this, the Committee expressed the view that there was no reason in principle why the prevalence of *Salmonella* contamination in the finished raw product should not within the next few years be reduced to a single figure percentage, on the basis of existing available technology, with the longer-term aim of effective elimination of poultry meat as a significant source of *Salmonell*a in the nation's food supply.

3. The Committee noted the results of surveillance work which seemed to indicate that there had been a steady reduction in the overall prevalence of *Salmonella* in UK-produced raw retail chicken over the period since 1979. The Committee encouraged the Government to conduct such future microbiological surveillance of raw poultry meat as was considered necessary to map progress towards the reduction and ultimate elimination of pathogens.

## Planned FSA surveillance

4. As a first step, the FSA is to carry out a survey to establish baseline data to enable progress on published targets to be monitored. The Agency has drawn up the attached draft protocol for a UK-wide survey of *Salmonella* and *Campylobacter* contamination of

fresh and frozen chicken on retail sale. Dr Paul Cook (FSA) is attending to present the protocol. Members' comments are invited.

**Secretariat**
**January 2001**


# UK-WIDE SURVEY OF *SALMONELLA* AND *CAMPYLOBACTER* CONTAMINATION OF FRESH AND FROZEN CHICKEN ON RETAIL SALE

## DRAFT PROTOCOL VERSION 25/01/2001

# CONTENTS

11. **APPENDIX 4** - Example of tables for recording sample information

12. **APPENDIX 5** – Flowcharts for microbiological methods

## BACKGROUND

1. In its 1996 report on poultry meat the ACMSF recommended "that the Government considers conducting such further microbiological surveillance of finished raw poultry meat at an appropriate time in the future as is necessary to map progress towards the reduction and ultimate elimination of pathogens". The committee also "saw no reason in principle why the prevalence of *Salmonella* contamination in the finished raw product should not within the next few years be reduced to a single percentage, on the basis of existing technology" (ACMSF 1996).

2. At its launch in April 2000 the Food Standards Agency set a target to reduce *Salmonella* contamination of retail UK chicken by 50% over the next 5 years. An Integral part of addressing this target is the setting of a baseline so that progress towards the target can be mapped at appropriate intervals. In addition, the results of the baseline survey may provide an indication of where particular contamination problems are occurring and hence where interventions to reduce *Salmonella* contamination might best be focused. The Agency has also set a target of reducing the incidence of food poisoning by 20% over a five-year period. A 50% reduction in *Salmonella* contamination of UK-produced chicken meat should contribute towards reducing human *Salmonella* infections from this source.

3. The baseline survey will focus on contamination of chicken carcasses and portions at retail. Although previous surveys have focused on chicken carcasses, chicken portions form a significant and increasing component of the chicken market and there is a need to assess the extent of *Salmonella* contamination.

## OBJECTIVES OF THE SURVEY

4. The primary objectives are to:

a) establish the prevalence of *Salmonella* on UK-produced and imported chilled and frozen chicken at retail in the UK

b) identify the *Salmonella* serotypes and phage types present and determine susceptibility of isolates to antimicrobial agents

In addition, the survey will also provide the opportunity to:

c) establish the prevalence and numbers of campylobacters on UK-produced and imported chilled and frozen chicken at retail in the UK

d) identify the *Campylobacter* species, serotypes and phage types present and determine susceptibility of isolates to antimicrobial agents

**TIMING**

5. The last national survey of retail chilled and frozen UK chicken was conducted between December 1993 and March 1994 (ACMSF Report on Poultry Meat 1996). In addition, pilot work on methodology for the present national study was conducted in late autumn and winter months of 1998 and 1999/2000.

6. Seasonality has been discussed with the poultry industry and experts in the field and there is little evidence of seasonality in *Salmonella* contamination of finished chicken. Although there is some evidence to suggest that there might be seasonality in *Campylobacter* contamination, this organism is still being included in the survey. The control of *Campylobacter* will be a major part of the Agency's strategy to reduce food-borne illness and the opportunity to gather data about contamination rates in poultry should not be ignored.

7. It is envisaged that the Agency's baseline estimate will be completed before the end of June 2001 and the main findings published as soon as possible thereafter.

**GEOGRAPHICAL DISTRIBUTION**

8. The survey will cover retail outlets in England, Wales, Scotland and Northern Ireland. The successful contractor will need to ensure that the appropriate number of samples are taken in each part of the UK and that sampling is distributed as uniformly as possible throughout the survey period. Table 1 shows the proportions of samples that would need to be taken in each part of the UK, if these were based on figures for consumption of chicken in the home in 1999.

**Table 1. Consumption of chicken in the UK in 1999**

| | ENGLAND | SCOTLAND | WALES | N.IRELAND |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| **Kg/person/week*** | 0.130 | 0.144 | 0.147 | 0.109 |
| **1999 population figures**** | 49,752,900 | 5,119,200 | 2,937,000 | 1,691,800 |
| **Total kg/week** | 6,467,877 | 737,165 | 431,739 | 184,406 |
| **Total kg/year** | 336,329,604 | 38,332,570 | 22,450,428 | 9,589,122 |
| **% of UK Consumption** | 83 | 9 | 6 | 2 |

*Broiler chicken, uncooked, including frozen. Source: National Food Survey, MAFF Statistics

**Mid-1999 estimates; Source Office for National Statistics

## SAMPLING PLANS

9. Table 2 shows the percentage market share for the major retailers of fresh and frozen whole chicken and portions in 1999. Seven retailers accounted for 74% of the chilled and 84% of the frozen whole chicken retail market. The same seven retailers accounted for 76% of the chilled and 84% of the frozen portion market. The full listing of the market share by retailers in Britain in1999 is shown in Appendix 1 for information.

10. The primary focus of the survey is *Salmonella* contamination, and the Agency's statisticians have calculated that the minimum sample size required for a baseline UK *Salmonella* contamination rate of 15%, 20% or 25% with an error of 1.5%, would be 2177, 2732 and 3201 respectively. A previous DH survey conducted in England and Wales in 1993/94 yielded a *Salmonella* contamination rate of 33% for chilled chicken and 41% for frozen chicken. However, testing of retail chickens (mostly chilled) in pilot work for the present survey gave figures closer to 20%, although this was a small-scale study and was not intended to be statistically representative of UK production. Unpublished data on portions suggest that the *Salmonella* contamination rate may be lower than for whole carcasses. Based on our current knowledge about *Salmonella* contamination of chicken, the minimum sample size for the baseline estimate would need to be 2732 samples, assuming simple random sampling and an overall contamination rate of 20%. However, a greater cost efficiency in terms of the survey can be achieved by having an element of clustering in the design. For example, it is more economical to take several chicken samples from a particular retailer on a visit than to take only one sample. Although the "clustering" approach will reduce the precision of a baseline estimate it results in greater efficiency overall and can be offset in part by increasing the sample size.

11. The other factor is the need to obtain reliable data for different parts of the UK. About 83% of UK chicken consumption is in England (Table 1). If we use consumption figures as a basis for the number of samples to be taken in each country then there would be far fewer from, for example, Northern Ireland compared to England. To ensure that we achieve a good representation of samples from all parts of the UK, and acknowledging the need for an element of clustering in the sampling, we have boosted the number of samples for Scotland, Wales and Northern Ireland to 800 each. This has the effect of increasing the total sample size for the survey to 4881. This level of sampling retains some of the information efficiency of a sampling strategy based on market-share, whilst ensuring that important patterns in the data will not be missed. It should achieve at least 80% power to detect a departure in any single country of 5% or

more from an average 20% baseline. The power of detection is over 90% if the atypical country has unusually low rather than high levels of contamination.

**Table 2. Percentages of UK market share by major retailers in 1999 for fresh and frozen whole chicken and portions (UK produced and imported)**

| Market Share % | Safeway | Sainsbury's | Somerfield/ Kwiksave | Tesco | Asda | Iceland | Co-op |
|---|---|---|---|---|---|---|---|
| **Fresh Whole** | 6.9 | 14.1 | 8.3 | 18.9 | 18.2 | 2.7 | 4.8 |
| **Fresh Portions** | **8.5** | **15.3** | **7.7** | **21.3** | **15.1** | **3.2** | **4.5** |
| **Frozen Whole** | 8.0 | 22.4 | 8.5 | 14.5 | 11.8 | 17.5 | 0.9 |
| **Frozen Portions** | **4.3** | **21.1** | **4.6** | **18.6** | **7.2** | **27.5** | **1.1** |

*Excluding butchers
Source: British Poultry Meat Federation

**Frozen chicken**

12. Most of the whole chickens sold at retail in the UK are chilled. In 1999 74% of retail whole chickens were chilled and 26% were frozen (Appendix 1). In the case of portions, 76% were chilled and 24% were frozen. Table 2 shows that retailers vary in the volumes of chilled and frozen birds that they sell. The top three retailers account for 51% of the chilled and 48% of the frozen whole chicken market. The market share in chicken portions shows that the top three retailers account for 45% of the chilled and 68% of the frozen portion retail trade.

**Table 3. Percentages of UK and Imported Whole Chickens which are fresh or frozen for six major retailers in August/September 2000**

| % | | Retailer A | Retailer B | Retailer C | Retailer D | Retailer E | Retailer F |
|---|---|---|---|---|---|---|---|
| **Fresh** | UK | 100 | 80 | 95 | 99 | 99 | 99.7 |
| | Non-UK | 0 | 20 | 5 | 1.0 | 1.0 | 0.3 |
| **Frozen** | UK | 100 | 85 | 100 | 55 | 100 | 100 |
| | Non-UK | 0 | 15 | 0 | 45 | 0 | 0 |

Source: Individual retailers

**Table 4. Percentages of UK and Imported Chicken portions which are fresh or frozen for five major retailers in August/September 2000**

| % | | Retailer A | Retailer B | Retailer C | Retailer D | Retailer E |
|---|---|---|---|---|---|---|
| **Fresh** | UK | 72 | 56 | 82.5 | 90 | 98.3 |
| | Non-UK | 28 | 44 | 17.5 | 10 | 1.7 |
| **Frozen** | UK | 76 | 0 | 100 | 55 | 70 |
| | Non-UK | 24 | 100 | 0 | 45 | 30 |

Source: Individual retailers

**Imported chicken**

13. The survey will need to include sufficient samples of imported chicken to ensure that comparisons can be made with UK-produced chicken. Where labelled, imported chicken should be purchased. However, imported poultry meat, particularly portions, is not always clearly labelled and information on how much imported poultry meat has been sampled will need to be derived retrospectively from codes on the packaging. Tables 3 and 4 show the percentages of whole birds and portions that are of non-UK origin for selected retailers. Whereas all of retailer A, C, E and F's frozen whole chickens are from the UK, 45% of retailer C's are of non-UK origin. Imported whole retail chickens are mostly from France with smaller amounts from Ireland and Holland. The smaller proportion of chilled imported chicken (0-20%, mostly about 1%) should be addressed in the sampling plan. A complicating factor is that in the case of imported whole frozen chicken, sampling will need to take account of the fact that, from the data we have received, only 2 major retailers appear to be importing whole birds. Chicken portions (Table 4) also show significant variation in the proportions of UK and non-UK products on retail sale, ranging from 0% imported frozen (retailer C), to 100% imported frozen (retailer B).

    The UK imports chicken from many different countries. Table 5 gives an overview of how much chicken is imported into the UK and the major sources of such imports. However, not all of this chicken will end up at retail. An attempt will be made to trace the origin of all chicken sampled as part of the survey.

**Table 5. Country of origin for different types of raw chicken imported into the UK between July 1999 and June 2000**

| Chicken Type | Country | Tonnes |
|---|---|---|
| Fresh Portions | Netherlands | 21,110 |
| | France | 6,556 |
| | Belgium | 4,618 |
| | Irish Republic | 1,672 |
| | Germany | 670 |
| Frozen Portions | Netherlands | 37,951 |
| | Brazil | 19,441 |
| | Thailand | 9,037 |
| | France | 8,383 |
| | Belgium | 2,930 |
| Fresh Whole Chickens | France | 18,008 |
| | Belgium | 4,192 |
| | Italy | 3,441 |
| | Netherlands | 2,838 |
| | Irish Republic | 208 |
| Frozen Whole Chickens | France | 7,743 |
| | Denmark | 4,310 |
| | Netherlands | 2,186 |
| | Irish Republic | 1,578 |
| | Germany | 1,335 |

Source: H M Customs and Excise
Data prepared by MAFF Statistics

**Production types**

14. The survey is not intended to make statistical comparisons between different production types of chicken. The vast majority of samples will be standard broiler chickens/portions. Other production types (e.g. free range, corn fed, organic) should be included in the survey in proportion to their market share although this is known to be small compared to standard broiler chicken and is also subject to considerable fluctuations. One problem is that specialist production types such as free range or organic may comprise a larger proportion of imported fresh chicken, thereby making it difficult to find imported standard chickens. Information on the breakdown of production types has been sought from major retailers. Free-range constitutes about

0.5-5%, corn fed <5% and organic about 0.2-1% of the fresh whole chickens that are sold. In the case of fresh portions, free-range constitutes about 1-4%, corn-fed about 2% and organic about 0.2-2%. As much as 50% of production types other than standard broiler chicken may be imported, primarily from France. Sampling will need to reflect these sectors although the samples sizes are likely to be too small to allow meaningful comparisons to be made between production types.

## CARRYING OUT THE SURVEY

### Purchase of chicken

15. The survey should comprise 4881 samples in total. These should be distributed over at least 1000 retail outlets, with no more than 5 samples from any one outlet, and no more than one of the same product type (e.g. frozen whole chicken, breast fillets etc.) from each retailer. The market share for whole chickens and portions by retailer is shown in Appendix 1.

16. It is recognised that there are differences in retail store distribution throughout the UK, and sampling will need to take this factor into account. For example, in Northern Ireland, there are no Asda, Somerfield or Waitrose stores.

17. The number of samples obtained from any single outlet should ideally reflect the chicken turnover of the outlet, so that more samples may be purchased from a visit to a large supermarket than from a visit to a small family butcher. Samplers should purchase whole and portioned chilled and frozen chickens from supermarkets, independent retailers and local butchers in the period from March/April to June 2001. Other outlets, e.g. farm stores and market stores should not be neglected, although these only represent a small proportion of the market share. The overall sampling framework is shown in Table 6. Sampling should be spread evenly throughout the survey period and throughout the working week. The Agency will liaise with the contractor on the outlets to be sampled in the survey. The data given in Appendix 1 shows that 74% of whole chicken is fresh and 26% is frozen. For portions, 76% are fresh and 24% are frozen.

18. The number of chicken samples of each type should be reviewed on a regular basis. An Excel 97 spreadsheet with the collected data should be submitted to the Agency at fortnightly intervals to ensure that if a deviation from the sampling plan is observed, adjustments can be made.

19. Only packaged whole birds and portions should be purchased although unwrapped birds and portions may need to be purchased from smaller butchers. Packaged

carcasses and portions whose wrappings are not intact should not be purchased. For whole chickens each carcass should be within the weight range 0.5 to 2kg. We recognise that carcasses are generally not less than 1kg in weight, the lower weight has been included to ensure that any smaller, imported birds are included. In the case of chicken portions/single packs of portions, these should be within the weight range 0.5-2.0kg. Sampling officers should attempt to take each sample at random from the shelves and not necessarily the bird or pack at the front of the display. If the label on the bird or portions is not clear then it should not be purchased for the survey.

20. When fresh un-packaged birds or portions are purchased from smaller butchers the sampling officer may need to inquire about the origin of the chicken or portions so that this can be recorded on the data sheets.

21. Chickens or portions should be sampled so that microbiological analysis is begun at least 2 days before the use by date. In order to achieve this, all samples should be purchased at least 3 days before the use-by date. Table 7 shows the types of chicken products that should be included in the survey.

**Distribution of Food Survey Leaflets**

22. After purchase of samples from retailers, the owner of the premises, or representative of the owner, **must** be given a copy of the Food Standards Agency's Food Survey Leaflet. [DN: The leaflet is still under development]. The leaflet informs the owner/store representative that a sample has been taken for a food survey and explains what will happen with the sample.

**Table 6. Sample Distribution**

| | **England** | **Scotland** | **Wales** | **Northern Ireland** |
|---|---|---|---|---|
| Number of samples | 2481 | 800 | 800 | 800 |
| Minimum Number of retail outlets | 500 | 166 | 166 | 166 |

Table 7 details the types of chicken products that should and should not be included in the samples.

**Table 7. Types of chicken products**

| | Whole chickens | Chicken Portions |
|---|---|---|
| **To be included in the survey** | Whole birds | Breast portions (skin on or off, fillet or bone-in),<br>drumsticks,<br>thighs,<br>wings,<br>quarters,<br>legs |
| **Not to be sampled** | Pre-stuffed,<br>Ready-basted,<br>Added value (herbed, marinated) | Added-value (marinated, herbed, pre-prepared),<br>chicken mince,<br>goujons or breast strips – 'stir-fry' chicken,<br>diced chicken breast,<br>breaded chicken |

**Transport of chickens**

23. Each chicken sample should be placed in a separate carrier bag and samples transported to the laboratory in a cool-box held at ≤5$^{o}$C. On arrival at the laboratory, the temperature of the sample should be measured prior to storage and testing, and noted in the appropriate box of the recording sheet (Appendix 4). Frozen chickens and portions should be stored in a freezer (at least -18$^{o}$C) until ready for testing. All frozen chickens or portions should be thawed out prior to testing, preferably in a refrigerator, or overnight, in individual containers at ambient, if <20°C. All chilled chickens should be stored at ≤5°C and tested within 24 hours of purchase and at least 2 days before the 'use-by' date.

**Sample information**

24. The data to be recorded from each chicken is shown in Appendix 5 for fresh and frozen whole chickens and portions. Information about each sample must be fully recorded on a data sheet before testing and each sheet completed by adding the results from microbiological testing. The information should be entered into a Microsoft Excel 97 Spreadsheet. The labels from the chicken packaging must be retained or photocopied such that all the information is reproduced clearly. Where peel back labels are used to give details of cooking instructions, this information must be retained or photocopied.

25. It is essential to identify the pack/producer codes from each sample so that the origin of the chicken can be determined retrospectively. It has been noted that the country of origin of a pack of chicken is not always apparent from examining the label. The Agency will be seeking co-operation from retailers to permit identification of imported chicken.

**Microbiological Methods**

Because of the significant amount of handling involved, and the potential for cross-contamination to occur, it is essential to keep the testing area clear and to deal with splashes or spillages as soon as they occur.

***Sample preparation – Whole carcasses***

26. Wearing disposable gloves, remove the chicken from its retail wrapping, taking care not to contaminate the outer surface of the carcass with any residual liquid. Remove the bag of giblets if present, (usually in frozen chickens), noting at the same time whether the bag is intact. Weigh the bag of giblets so that the weight of the carcass can be adjusted when the data is analysed. Retain the label from the packaging.

27. Transfer the chicken to a sterile disposable tray. Wearing disposable gloves, aseptically remove 25 g of neck-skin using a sterile scalpel and place into a stomacher bag (~180mm x 300mm). Place the chicken vertically into a large stomacher bag (~ 380 x 505mm) so that the vent is uppermost. Pour 300 ml of Buffered Peptone Water (BPW) through the vent into the abdominal cavity of the chicken. Twist the bag about halfway down while ensuring that most of the air is squeezed out of the bag. Rinse the chicken carcass for 1 minute by shaking the bag, ensuring that the BPW comes into contact with all chicken surfaces. Pour the rinse into the smaller stomacher bag containing the neck-skin and stomach for 2 minutes. After stomaching, please follow testing detailed in section 30 onwards.

***Sample preparation – Chicken portions***

28. Remove the chicken from its retail wrapping, taking care not to contaminate the outer surface of the portions with any residual liquid. Note how many portions are present in the pack. Retain the label from the packaging.

29. Transfer the chicken to a sterile disposable tray. If skin is present, aseptically remove 25g (remove all skin if less than 25g and record the amount weighed) with a sterile scalpel and place into a stomacher bag (~180mm x 300mm). Place the remainder of the chicken into a large stomacher bag (~ 380 x 505mm) containing 300 ml of Buffered

Peptone Water (BPW). Twist the bag about halfway down while ensuring that most of the air is squeezed out of the bag. Rinse the chicken portions for 1 minute by shaking the bag, ensuring that the BPW comes into contact with all chicken surfaces. Pour the rinse into the smaller stomacher bag containing the skin (if present) and stomach for 2 minutes.

30. Remove 5 ml of homogenate for enumeration of *Campylobacter*, using a sterile open-ended pipette.

31. Transfer 25ml of homogenate using a sterile open-ended pipette, to a 300ml sterile plastic container (e.g. honey jar).

32. Pour the remaining contents of the stomacher bag into another sterile plastic container (e.g. honey jar) for enrichment of *Salmonella*.

**Testing laboratories should ensure that they have pure cultures of standard reference strains of both *Salmonella* and *Campylobacter*, from which colonies can be identified correctly.**

***Enumeration of* Campylobacter *spp*.**

33. Spread plate 0.5 ml from neat and $10^{-1}$ and $10^{-2}$ dilutions (dilute using Maximum Recovery Diluent – MRD) onto Charcoal Cefoperazone Deoxycholate Agar (CCDA) plates, all plates in duplicate. Care should be taken to ensure that all CCDA plates are sufficiently dry before plating out. Incubate plates in a microaerobic atmosphere for 24h at 37°C ± 0.5°C, followed by a further 24 h at 41.5°C ± 0.5°C. *Campylobacter* will grow well if oxygen does not exceed 10% and there is at least 5% $CO_2$. A number of commercially available gas-generating kits fulfill these criteria. Where microaerobic atmospheres are generated by other means, e.g. using a VAIN cabinet or manual gas-mixing, a suitable gas mixture would consist of 10% $CO_2$, 10% $H_2$, 5% $O_2$ and 75% $N_2$.

34. Subculture 5 typical colonies onto Columbia Blood Agar (BA) and perform the following confirmatory tests for *Campylobacter* spp: Gram-stain for morphology **using carbol fuchsin for the counter stain**, oxidase test, growth after 48h under microaerobic conditions at 37°C ± 0.5 °C, and growth after 48h in air at 20°C ± 0.5 °C.

35. Following confirmation that colony types on CCDA plates are *Campylobacter* spp., count the number on the duplicate plates to determine the number per ml of the dilution plated. Multiply this by the dilution factor and then by the total rinse volume, to

give the number per carcass, portions and weight (g). Plates containing only a few colonies should be included in the count to improve the cell detection limit.

36. After confirmation of *Campylobacter*, remove a heavy inoculum from 1/4 of the blood plate and emulsify this in the liquid supplied with each container of beads (e.g. Mast or ProLab). Mix by inversion and remove the liquid phase using a disposable Pasteur pipette. Freeze *Campylobacter* isolates on beads at –40°C or lower. One confirmed isolate from each chicken sample and 5 isolates from every 5$^{th}$ *Campylobacter*-positive chicken sample should be frozen.

37. For the purpose of typing, only *Campylobacter* colonies isolated from enumeration should be sent to the reference laboratory.

38. To send isolates for typing, transfer the bead to a blood agar plate. Streak and incubate for 24-48 hours in microaerobic conditions at 37°C ± 0.5°C. The plate should be checked for purity. Swab the culture with a charcoal swab (e.g. Amies Transport) and send to: PHLS Laboratory of Enteric Pathogens (LEP), CPHL, 61 Colindale Avenue, London NW9 5HT (Tel: 020 8200 4400) for confirmation, serotyping, phage typing, antibiotic susceptibility testing and archiving.

***Enrichment culture for* Campylobacter *spp.***

39. Add 225 ml Exeter Modified *Campylobacter* Broth (ECB) to the 25g sample in the sterile plastic container (e.g. honey jar).

40. Incubate for 48 h at 37°C ± 0.5°C

41. After incubation, streak 10 µl of the enrichment broth onto CCDA. Incubate at 37°C ± 0.5°C. for a further 48h in a microaerobic atmosphere.

42. Subculture 3 typical colonies of *Campylobacter* spp. on to Columbia Blood Agar (BA) and perform confirmatory tests: Gram-stain for morphology **using carbol fuchsin for the counter stain**, oxidase test and growth after 48h under microaerobic conditions at 37°C ± 0.5°C, and growth after 48h in air at 20°C ± 0.5°C. If none were confirmed from the chicken sample by the enumeration procedure then store confirmed isolates as described previously (section 36).

***Enrichment culture for* Salmonella**

43. Incubate sample in a sterile plastic container for 18-20 h at 37°C ± 0.5°C for non-selective pre-enrichment.

44. Add 0.1 ml of the pre-enriched culture to 10 ml Rappaport-Vassiliadis Soya Peptone Broth (RVS) and incubate for selective enrichment at 41.5°C ± 0.5°C for 24 h in an incubator. Also, add 10 ml of the pre-enriched cultures to 100 ml Selenite Cystine Broth with added Sodium Biselenite (SCB), (4g/l) and incubate for selective enrichment at 37°C ± 0.5°C for 24 h.

45. After selective enrichment streak a 10µl loop from the selective enrichment broths onto modified Brilliant Green Agar (mBGA) and Xylose Lysine Desoxycholate agars (XLD). Incubate plates for 24 h at 37°C ± 0.5°C. Colonies on mBGA: red/pink or white opaque colonies with brilliant red/pink zone, on XLD: red with black centre. Plates should not be incubated for longer than 24 hours, as this will encourage growth of other flora.

46. Perform appropriate biochemical tests for *Salmonella* (see Appendix 3) on typical or suspect colonies (3 from each sample) from both mBGA and XLD plates. Isolates showing typical *Salmonella* biochemical reactions should be tested with polyvalent antisera for typical O and H antigens.

47. Send one isolate of each *Salmonella* type on a nutrient agar slope to PHLS Laboratory of Enteric Pathogens, CPHL, 61 Colindale Avenue, London NW9 5HT Tel: (020 8200 4400) for confirmation, serotyping, phage typing, antibiotic susceptibility testing and archiving.

**Data Handling**

**Prior to commencing the survey, an Excel 97 spreadsheet must be set up to record all the data from each chicken sample (as shown in Appendix 5) and the results of all typing work.**

48. The primary data to be recorded for each chicken sample is shown in Appendix 4. All data must be fully recorded and forwarded to the relevant person for entry into a Microsoft Excel 97 Spreadsheet.

49. The chicken packaging labels should be cut out and retained or photocopied, ensuring that all the information is reproduced clearly. Photocopies must be stapled to the recording form in a way that ensures the package information does not become separated from the original recording sheet.

50. **IMPORTANT:** Each chicken should be given a unique identification number. We recommend including letters in identification numbers, e.g. W = whole chicken, P = portion. Isolates of *Salmonella* and *Campylobacter* sent for typing and archiving should retain the same reference number given for sampling, so that typing results can be clearly linked to a particular sample.

51. The contractor is responsible for collating the primary data and for its presentation to the Agency. The contractor must also ensure that a Quality Assurance system is in place to ensure a high level of accuracy in data entry, data checking and data backup.

52. The contractor will also be expected to incorporate into the Excel 97 spreadsheet data on serotyping, phage typing and antimicrobial susceptibility testing for the isolates sent to the **Laboratory of Enteric Pathogens (LEP), CPHL, PHLS, 61 Colindale Avenue, London NW9 5HT.**

## REPORTS TO THE AGENCY

### Interim Reports

53. A copy of the Excel 97 spreadsheet data should be submitted to the Agency at fortnightly intervals so that the sampling plan can be reviewed by the Agency's statisticians.

54. An interim report, detailing summary findings shall be submitted to the Agency at monthly intervals. The report should specify how many UK-produced and imported (where known) fresh and frozen chickens and portions have been sampled and provide tables summarising the microbiological results for these chickens.

### Zoonoses Order

55. Under the Zoonoses Order, laboratories which isolate *Salmonella* from foodstuffs, are expected to provide MAFF [and DARDNI in Northern Ireland] with a listing of subtypes found together with the name of the retailer where the chicken was purchased. The person in charge of the laboratory that isolates *Salmonella* spp. in the course of the survey must report it to a Veterinary Officer of MAFF [and DARDNI] giving the following details:
    - the known or suspected identity of the organism
    - the nature of the sample from which the designated organism was isolated

- the address of the premises at which the sample was taken and the name of the owner or person in charge of those premises (*the name of the owner can be a company)*
- the species and type of animal or bird from which the sample was taken
- the date on which the sample was examined
- the name and address of the person submitting the report, and signature

Please see form ZO2 in Appendix X. A separate form is needed for submission of *Salmonella* isolates to the Northern Ireland Department of Agriculture. The form is included in Appendix X. **[DN: Forms to be added].**

**Final Report to the Agency**

56. The contractor is responsible for collating the results of the survey, and a final report shall be submitted to the Agency once the survey has been completed. The report should present summary statistics on the prevalence of *Salmonella,* the prevalence and numbers for *Campylobacter* spp. together with a breakdown of the serotypes, phage types and antimicrobial susceptibility patterns for the isolates. The results should not be subjected to statistical analysis by the contractor as this will be undertaken by the Agency's statisticians. The Excel 97 spreadsheet(s) should be provided on disc as well as in hard copy form,

**57. All forms, details of products, documentation and electronic files must be retained by the contractor to ensure that details can be traced, should issues arise after completion of the survey.**

## APPENDIX 1

### VOLUME BY ESTIMATED NUMBER OF BIRDS: WHOLE CHICKEN

| | Volume (Millions of Chickens) | | |
|---|---|---|---|
| | 1998 | 1999 | % Change |
| Fresh | 68.022 | 70.397 | +3 |
| Frozen | 33.263 | 24.687 | -26 |
| **Total** | **101.285** | **95.084** | **-6** |

**Source: British Poultry Meat Federation**

### PERCENTAGE SHARE OF TRADE BY RETAILER IN 1999: WHOLE CHICKEN

| VOLUME | Fresh | Frozen |
|---|---|---|
| All Outlets | 100 | 100 |
| Asda | 18.2 | 11.8 |
| Budgen | 0.7 | 0.1 |
| Co-Op (Excl Butchers) | 4.8 | 0.9 |
| Somerfield | 6.8 | 1 |
| Kwiksave | 1.5 | 7.5 |
| Morrisons | 6.5 | 2.3 |
| Presto | 0 | 0 |
| Safeway | 6.9 | 8 |
| Sainsbury | 14.1 | 22.4 |
| Tesco | 18.9 | 14.5 |
| Waitrose | 0.9 | 0.3 |
| Other Multiples | 5.3 | 4 |
| Symbols | 0 | 1.4 |
| Iceland | 2.7 | 17.5 |
| Other Freezer Centres | 0 | 4.7 |
| Other Grocers | 0.9 | 0.7 |
| Butchers | 8 | 1.1 |
| Marks And Spencer | 1.3 | 0 |
| Other Outlets | 2.2 | 1.8 |

**Source: British Poultry Meat Federation**

**VOLUME SOLD IN TONNES OF CHICKEN PORTIONS**

| Chicken Portions | Volume (Tonnes) | | |
|---|---|---|---|
| | 1998 | 1999 | % Change |
| **Fresh** | 112410 | 121403 | +8 |
| **Frozen** | 41959 | 38062 | -9 |
| **Total Portions** | **154369** | **159465** | **+3** |

**Source: British Poultry Meat Federation**

**PERCENTAGE SHARE OF TRADE BY RETAILER IN 1999: CHICKEN PORTIONS**

| | Fresh | Frozen |
|---|---|---|
| All Outlets | 100 | 100 |
| Asda | 15.1 | 7.2 |
| Budgen | 0.4 | 0.1 |
| Co-Op (Excl Butchers) | 4.5 | 1.1 |
| Somerfield | 5.8 | 0.7 |
| Kwiksave | 1.9 | 3.9 |
| Morrisons | 2.6 | 1.6 |
| Presto | 0 | 0 |
| Safeway | 8.5 | 4.3 |
| Sainsbury | 15.3 | 21.1 |
| Tesco | 21.3 | 18.6 |
| Waitrose | 0.8 | 0.2 |
| Other Multiples | 1.8 | 2.8 |
| Symbols | 0.1 | 0.1 |
| Iceland | 3.2 | 27.5 |
| Other Freezer Centres | 0 | 4.1 |
| Other Grocers | 0.3 | 0.6 |
| Butchers | 10.2 | 4.6 |
| Marks And Spencer | 4.2 | 0 |
| Other Outlets | 4.1 | 1.7 |

**SOURCE: BRITISH POULTRY MEAT FEDERATION**

**APPENDIX 2**

**Selective Media**

The following list describes the media required to carry out the tests. Equivalent media from commercial manufacturers may be used.

**Buffered Peptone Water**

| | |
|---|---|
| Peptone | 10.0g/l |
| Sodium chloride | 5.0g/l |
| Disodium hydrogen phosphate | 3.5g/l |
| Potassium dihydrogen phosphate | 1.5g/l |

Adjusted to pH 7.2 ± 0.2

**Maximum Recovery Diluent (Peptone Saline Diluent)**

| | |
|---|---|
| Peptone | 1.0g/l |
| Sodium chloride | 8.5g/l |

Adjusted to pH 7.0 ± 0.2

***Selenite Cysteine Broth***

| | |
|---|---|
| Tryptone | 5.0g/l |
| Lactose | 4.0g/l |
| Disodium phosphate | 10.0g/l |
| L-Cysteine | 0.01g/l |
| Sodium biselenite | 4.0g/l |

Adjusted to pH 7.0 ± 0.2

***Rappaport-Vassiliadis medium***

| | |
|---|---|
| Soya peptone | 4.5g/l |
| Sodium chloride | 7.2g/l |
| Potassium dihydrogen phosphate | 1.26g/l |
| Magnesium chloride(anhydrous) | 13.58g/l |
| Malachite green | 0.036g/l |
| Di-potassium hydrogen phosphate | 0.18g/l |

Adjusted to pH 5.2±0.2

***Brilliant Green Agar (Modified)***

| | |
|---|---|
| 'Lab-Lemco' powder | 5.0g/l |
| Proteose peptone | 10.0g/l |
| Yeast extract | 3.0g/l |
| Disodium hydrogen phosphate | 1.0g/l |

| | |
|---|---|
| Sodium dihydrogen phosphate | 0.6g/l |
| Lactose | 10.0g/l |
| Sucrose | 10.0g/l |
| Phenol red | 0.09g/l |
| Brilliant green | 0.0047g/l |
| Agar | 12.0g/l |

Adjusted to pH 6.9±0.2

**Xylose-lysine-desoxycholate (XLD) agar**

| | |
|---|---|
| Yeast extract | 3.0g/l |
| L-Lysine HCI | 5.0g/l |
| Xylose | 3.75g/l |
| Lactose | 7.5g/l |
| Sucrose | 7.5g/l |
| Sodium desoxycholate | 1.0g/l |
| Sodium chloride | 5.0g/l |
| Sodium thiosulphate | 6.8g/l |
| Ferric ammonium citrate | 0. 8g/l |
| Phenol red | 0.08g/l |
| Agar | 12.5g/l |

**Adjusted** to pH 7.4.±0.2

**MacConkey Agar**

| | |
|---|---|
| Peptone | 20.0g/l |
| Lactose | 10.0g/l |
| Bile salts | 5.0g/l |
| Sodium chloride | 5.0g/l |
| Neutral red | 0.075g/l |
| Agar | 12.0g/l |

Adjusted to pH 7.4 ± 0.2

**Urea Broth**

| | |
|---|---|
| Peptone | 1.0g/l |
| Glucose | 1.0g/l |
| Disodium phosphate | 1.2g/l |
| Potassium dihydrogen phosphate | 0.8g/l |
| Sodium chloride | 5.0g/l |

| | |
|---|---|
| Phenol red | 0.004g/l |
| 40% Urea solution | 5ml/l |
| Adjusted to pH 6.8 ± 0.2 | |

**Triple Sugar Iron Agar**

| | |
|---|---|
| 'Lab-Lemco' powder | 3.0g/l |
| Yeast extract | 3.0g/l |
| Peptone | 20.0g/l |
| Sodium chloride | 5.0g/l |
| Lactose | 10.0/g |
| Sucrose | 10.0/g |
| Glucose | 1.0/g |
| Ferric citrate | 0.3g/l |
| Sodium thiosulphate | 0.3g/l |
| Phenol red | q.s |
| Agar | 12.0g/l |
| Adjusted to pH 7.4 ± 0.2 | |

**Lysine Iron Agar**

| | |
|---|---|
| Bacteriological peptone | 5.0g/l |
| Yeast extract | 3.0g/l |
| Glucose | 1.0g/l |
| L-lysine | 10.0g/l |
| Ferric ammonium citrate | 0.5g/l |
| Sodium thiosulphate | 0.04g/l |
| Bromocresol purple | 0.02g/l |
| Agar | 14.5g/l |
| Adjusted to pH 6.7 ± 0.2 | |

**Nutrient Agar**

| | |
|---|---|
| 'Lab-Lemco' powder | 1.0g/l |
| Yeast extract | 2.0g/l |
| Peptone | 5.0g/l |
| Sodium chloride | 5.0g/l |
| Agar | 15.0g/l |

Adjusted to pH 7.4 ± 0.2

**Nutrient Broth**

| | |
|---|---|
| 'Lab-Lemco' powder | 10.0g/l |
| Peptone | 10.0g/l |
| Sodium chloride | 5.0g/l |

Adjusted to pH 7.5 ± 0.2

**Modified Exeter Campylobacter Broth**

| | |
|---|---|
| Nutrient Broth | 25g/l |
| Lysed **defibrinated** Horse blood | 5% |

*Campylobacter selective supplement: (Only available commercially from MAST SV59)*

| | |
|---|---|
| Trimethoprim | 10mg/l |
| Rifampicin | 5mg/l |
| Polymyxin B | 2500IU/l |
| Cefoperazone | 15mg/l |
| Amphotericin B | 2mg/l |

*Campylobacter Growth Supplement:*

| | |
|---|---|
| Sodium metabisulphate | 250mg/l |
| Sodium pyruvate | 250mg/l |
| Ferrous sulphate | 250mg/l |

**Charcoal Cefoperazone Deoxycholate Agar (CCDA)**

| | |
|---|---|
| Nutrient Broth | 25g/l |
| Bacteriological charcoal | 4g/l |
| Casein hydrolysate | 3g/l |
| Sodium desoxycholate | 1g/l |
| Ferrous sulphate | 0.25g/l |
| Sodium pyruvate | 0.25g/l |
| Agar | 12g/l |
| CCDA Selective supplement: | |
| Cefperazone | 32mg/l |
| Amphotericin B | 10mg/l |

Adjusted to pH 7.4±0.2

**Columbia Blood Agar**

| | |
|---|---|
| Special peptone | 23.0g/l |
| Starch | 1.0g/l |
| Sodium chloride | 5.0g/l |

| | |
|---|---|
| Agar | 10.0g/l |
| Horse blood | 5% v/v |

Adjusted to pH 7.3 ± 0.2

## Appendix 3

### *Salmonella* Confirmatory Tests

| **Biochemical test** | **Reaction (typical +ve)** | ***% Salmonella*** inoculations **showing** the reaction |
|---|---|---|
| Acid formation on glucose in TSI | Yellow butt (red or unchanged shows -ve) | 100 +ve |
| Gas formation on glucose in TSI | Bubbles or cracks in butt | 91.9 +ve |
| Lactose or sucrose fermentation in TSI | Yellow slant | Lactose - 99.2 -ve<br>Sucrose - 91.6 -ve |
| Hydrogen sulphide formation in TSI | Black butt | 91.6 +ve |
| Lysine decarboxylation | Purple colour in lysine decarboxylation medium | 94.6 +ve |
| Urea broth | No colour change (+ve)<br>Red (-ve) | |

| Lab Ref. No. |
|---|

## APPENDIX 4

## SAMPLE TABLE FOR RECORDING DATA*

*Section 1 – to be completed by the sampling officer*

| | | | |
|---|---|---|---|
| **Chicken Ref. No.** | | **Sampler Ref. No.** | |
| **Date and Time Purchased** | | **Name of Retailer** | |
| **Off shelf or in-store butcher (Supermarket only)** | | **Retailer Location (including post-code)** | |
| **Label Bar Code** | | **Date and Time received at lab** | |
| **Date and time chicken tested** | | **Temperature of sample on arrival at lab** | |
| **Weight of chicken/pack (kg)** | | **Chicken type (please circle)** | **fresh/frozen** |
| **No. of portions in pack** | | **If skin present, weight tested (g)** | |
| **Boneless (please circle)** | **Y / N** | **Brand Name (e.g. value, economy)** | |
| **Tray present** | **Y / N** | **Giblets present (please circle) give bag weight (g)** | **Y / N** |
| **Production type*** | | **Use-by date** | |
| **Display until date** | | **Country of origin** | |
| **Producer/Pack Number** | | **Chicken wrapped (please circle)** | **Y / N** |

| | | | |
|---|---|---|---|
| **Pack Price + Price per kg** | | **Store display temp (if known)** | |
| **Details of basic cooking instructions (if given)** | | | |

*Section 2*

| | ***Salmonella*** | ***Campylobacter*** |
|---|---|---|
| **Detected? (Y/N)** | | |
| **Total colony count on carcass** | **N/A** | |
| **No. of colonies sent for typing** | | |

*Section 3* – Serotype and Phage type of Salmonella isolate(s)

| |
|---|
| |

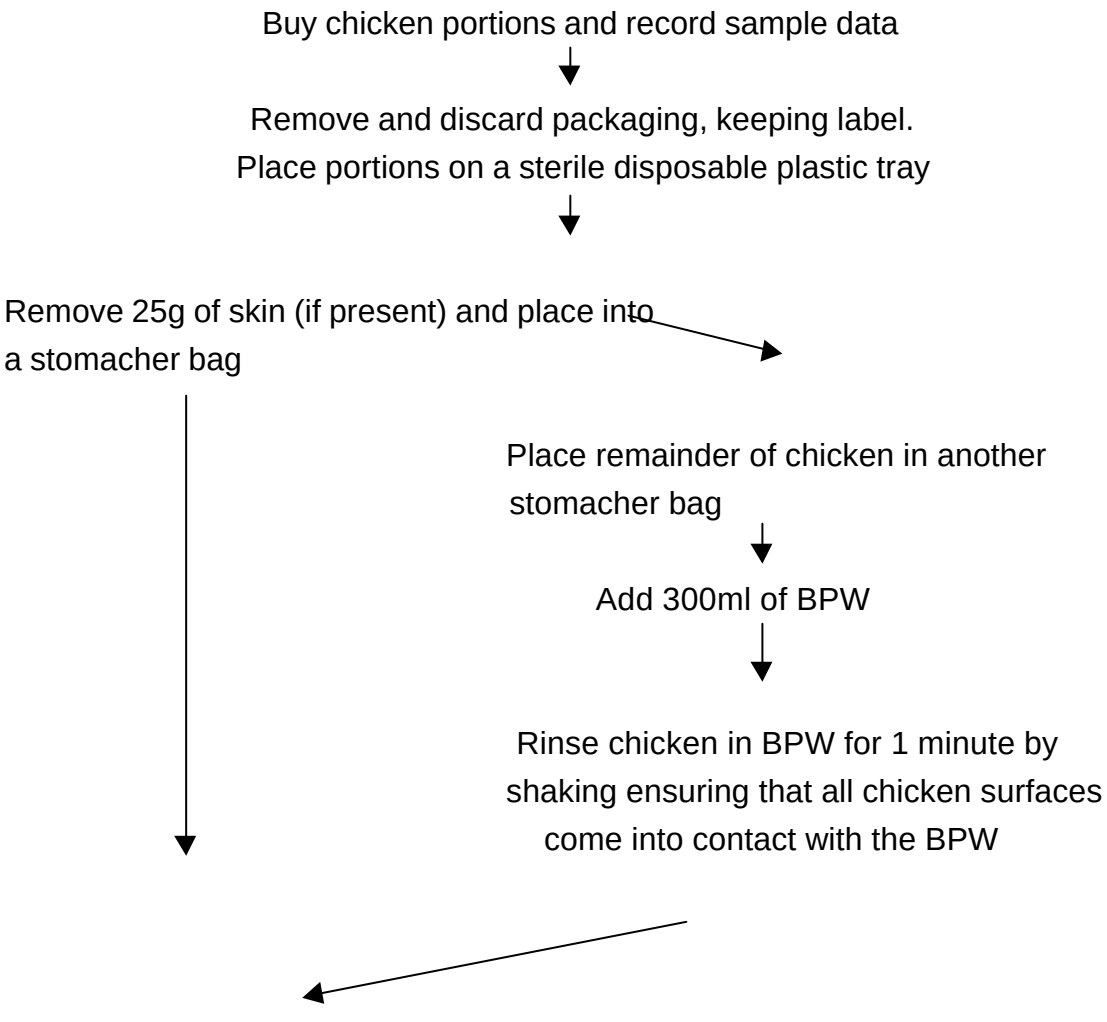
Details of *Campylobacter* typing and *Campylobacter* and *Salmonella* antimicrobial resistance results should be recorded in the Excel Spreadsheet

*** Please attach original packaging (or photocopy) to this form**

**APPENDIX 5**

Flowcharts for the microbiological methods

**Protocol for testing raw chicken portions**



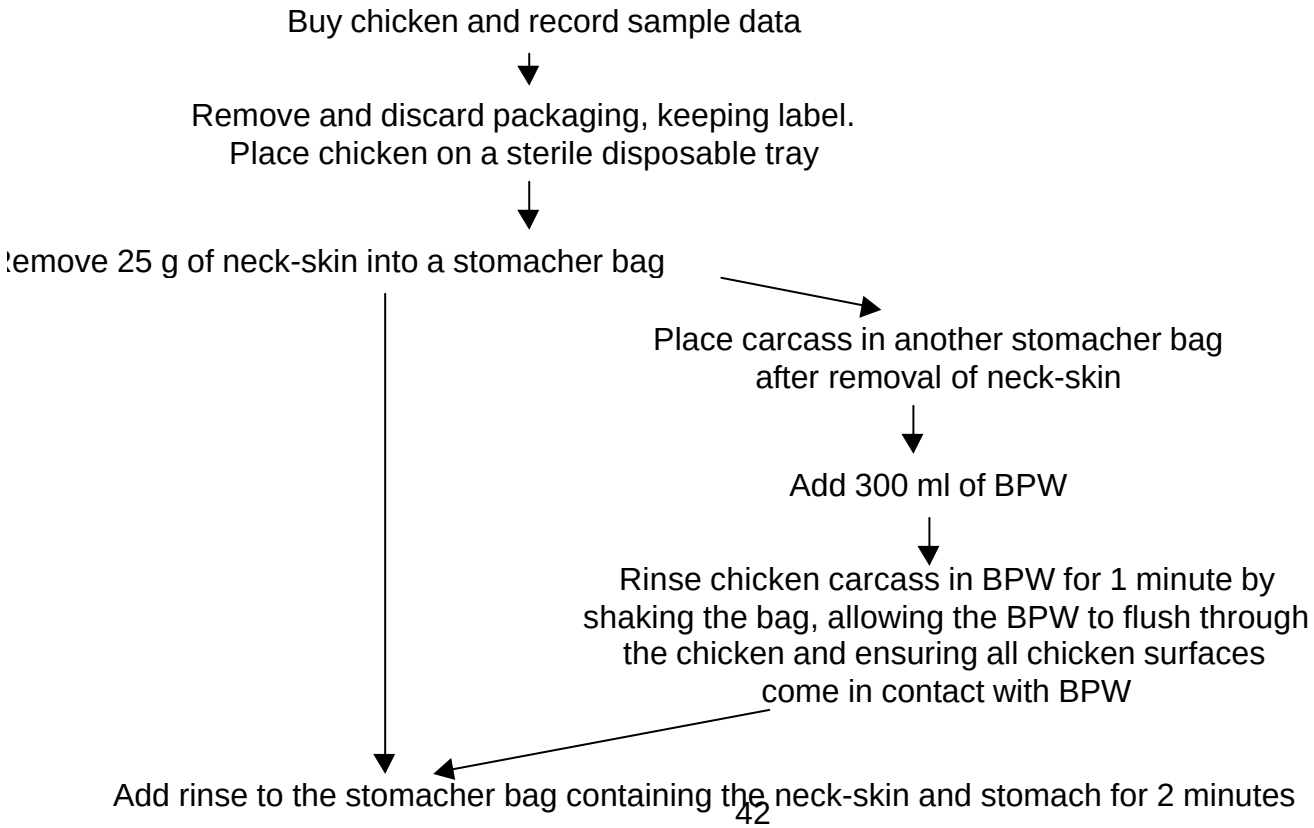
Remove 5ml for **Enumeration of *Campylobacter***

Weigh 25g into sterile plastic container (e.g. honey jar) for **Enrichment of *Campylobacter***

Add remaining content of stomacher bag into sterile plastic container (e.g. honey jar) for

**Enrichment of *Salmonella***

**Protocol for testing whole raw retail chicken**






Remove 5 ml for

Weigh 25 g into sterile plastic container (e.g. honey jar) for Enrichment **of** ***Campylobacter***

Add remaining content of stomacher bag into sterile plastic container (e.g. honey jar) for **Enrichment of *Salmonella***

**Enumeration of *Campylobacter* spp.**

Surface spread 0.5 ml of Neat, $10^{-1}$ and $10^{-2}$ dilutions (prepared in MRD) of homogenate in duplicate onto CCDA plates

↓

Incubate for 24 hours under microaerobic conditions at 37 °C, followed by 24 hours at 41.5°C

Examine for typical colonies. Subculture 3 typical colonies onto

Perform initial confirmatory tests as described for the direct enumeration of *Campylobacter*

Subculture 5 typical colonies onto Columbia BA and perform initial confirmatory

tests: Gram stain for morphology, oxidase test, growth at 37 °C under microaerobic conditions for 48 hrs and growth in air at 20°C after 48 hours

Following confirmation that colony types on CCDA plates are *Campylobacter* spp., count numbers on the duplicate plates to determine the number per ml of the dilution plated. Multiply this by the dilution factor and then by the total rinse volume, to give the number per carcass, portions and weight

After confirmation of *Campylobacter*, freeze isolates at -40°C or lower, on beads

**Enrichment for *Campylobacter* spp.**

Add 225 ml of Exeter Modified *Campylobacter* Broth to the sterile container with the 25 g sample

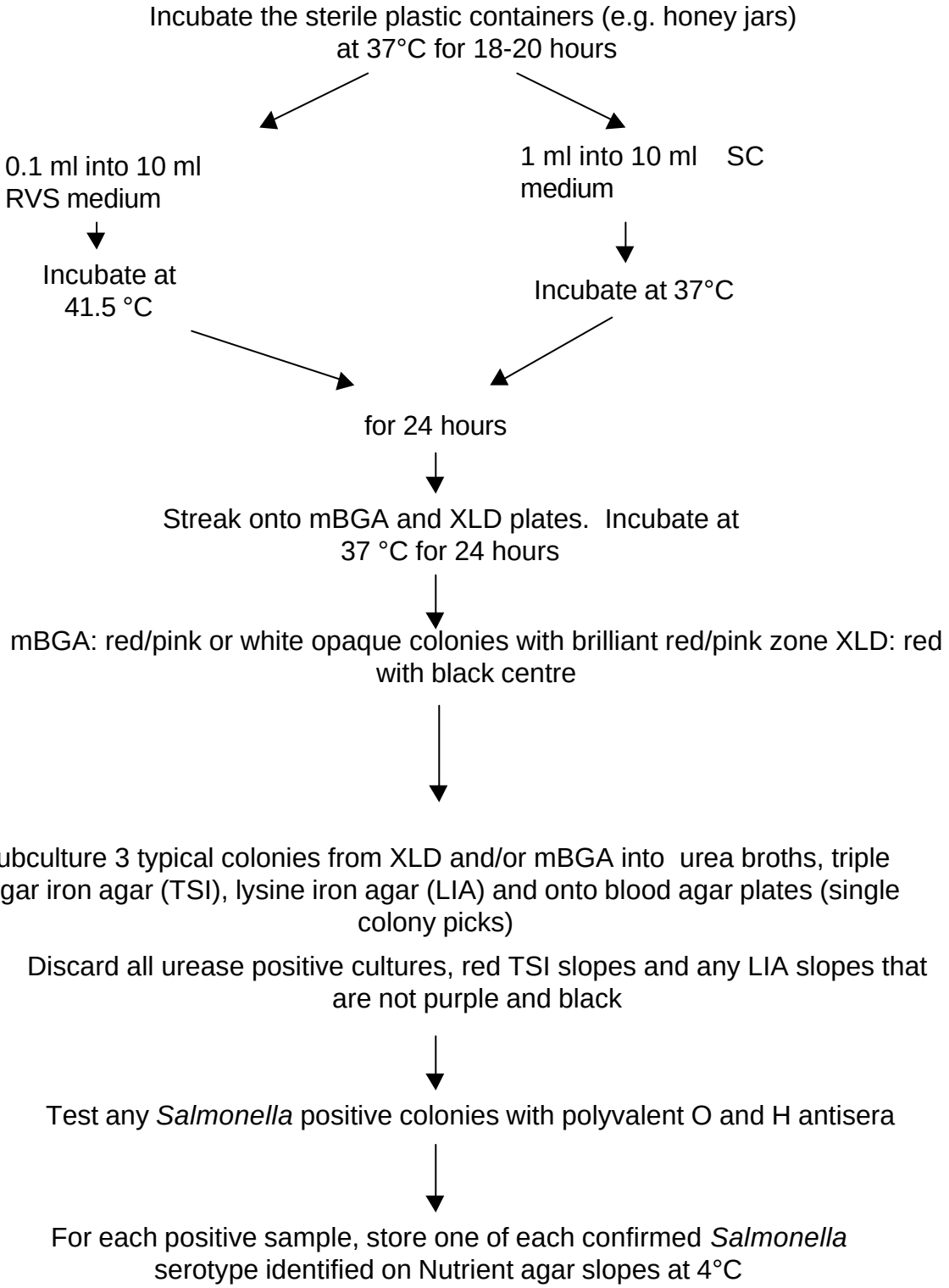
Incubate at 37 °C for 48 hours



Streak onto CCDA

Examine for typical colonies. Subculture 3 typical colonies onto Columbia BA

**Enrichment for *Salmonella* spp.**



**ANNEX D**

## Food Standard Agency (FSA)'s foodborne disease target : setting the baseline

This is included in the strategy document published separately on the FSA's website in May 2001.

**ANNEX E**

## THE FOOD STANDARD AGENCY'S FOODBORNE DISEASE TARGET: SETTING THE BASELINE (SURV/4)

## DETAILED COMMENTS MADE BY ACMSF SURVEILLANCE WORKING GROUP MEMBERS AND CONVEYED TO FSA

### General observations

1. A number of general observations made by Working Group Members were submitted to the FSA. These are as follows :-

- a major difficulty will be confirming that illness originated from food. PHLS has had great difficulties over the years in providing good evidence of that link and there is a lack of robust data to show the proportion of infectious intestinal disease (IID) which is foodborne (see also paragraph 2 below);

- data collection and coordination should be kept as simple as possible;

- it is less important which system of data collection is adopted than that the same system is used in England, Wales, Scotland and Northern Ireland, and that the system is not changed over the 5 year period over which progress is being measured. This is essential in avoiding apparent changes in foodborne disease notifications becoming an artefact of changes in the reporting system(s);

2. The complexity of the proposed system was of concern to Members, especially bearing in mind the uncertainty of many of the assumptions, notably :-

- the proportion of IID which is foodborne. How are the assumptions justified ? How are differences between US and UK assumptions explained (eg. *Salmonella* : UK 80% USA 95%; Norwalk-like viruses : UK 10%, USA 40%) ?;

- the proportion of cases disregarded as acquired abroad;

- the relationship between laboratory reports and actual cases. What is the evidence that IID data remain reliable ?;

**Detailed comments**

3. Detailed comments made by Surveillance Working Group Members were also submitted to the FSA as follows in relation to specific paragraphs of the paper :-

- paragraph 5 : in relation to the third bullet point ([the system should ideally] “be independent of [Food Standards] Agency control”), the Group felt that the FSA should certainly establish the system but not be able to manipulate its outputs;

- paragraph 6 : there are too many data collection systems which risks the position being over-complicated and confusing;

- paragraph 7 : there may be strong grounds for speculating on the specific countries associated with food poisoning acquired abroad, but it is far more difficult to obtain confirmatory evidence;

- paragraphs 8 and 9 : there are dangers inherent in attempting to arrive at the “true number” of cases. If the same system is applied for 5 years, any change will be apparent. Adjusting notifications by some factor, even where this is reasonably well-founded like those in the IID study, could well result in pressure for further adjustments in years 2-5. There is virtue in keeping the system as simple as possible;

- paragraph 10 : it is essential that everyone uses the same criteria/questions/questionnaires/reporting, including GPs;

- paragraph 11 : to identify trends in individual organisms, large numbers of outbreaks/cases are needed. The system that is criticised identified *S. enteritidis* PT4, *S. typhimurium* DT104 and others because there were numbers of cases;

- paragraphs 15-17 : the limitations of PHLS reporting of isolations needs to be recognised. Depending on the organism, the isolate may be from faeces, blood, csf, etc. The patient may or may not be hospitalised with a

food-related illness. Are these isolations really meaningful ? If more samples are tested, the number of isolations is almost certain to increase; but this may not reflect a real increase in the incidence of foodborne disease;

- paragraph 19-25 : trying to reflect under-ascertainment and under-reporting introduces an element of guess-work. There is virtue in simplicity;

- paragraph 31 : the reference to the recent consumer survey seems misleading. This was surely a survey of consumer attitudes and perceptions as opposed to any meaningful attempt to measure incidence;

- Annex 1 : before a decision is taken to include a particular organism in the new survey, it is essential to be sure that there is a specific test. For example, testing for *Aeromonas* spp is fraught with difficulty – they are ubiquitous in many raw foods and sometimes in water but, despite being consumed on a daily basis, are not causing a noticeable problem. Similar comments apply in respect of *Bacillus* spp., *Vibrio* spp., and *Yersinia* spp.

4. At a broader level, Working Group Members expressed serious concern about the principle of the foodborne disease target baseline consultation. Paragraph 3 of the paper could be construed as implying that the paper SURV/4 has been properly considered by the Surveillance Working Group. In fact, because the paper was only tabled on the day the Working Group met (ie. on 13 February), Members were not able to discuss it at the meeting itself.

5. Members also noted that reducing the incidence of foodborne disease by 20% by April 2006 is probably the most important target that Government has set relevant to the work of the ACMSF since the Committee's inception. Against that background, there was a strong view that the full ACMSF should have had the opportunity for a substantive discussion of SURV/4.

6. Finally, the paper acknowledges that the proposed system is highly complex. In the view of Surveillance Group Members, unless it can be simplified, or at least

explained much more transparently, the FSA may be in severe danger of failing to convince anyone that it has a proper measure of its promised outcome.