

**Food Sampling by District Councils in Northern
Ireland in 2008**
**A report of the Northern Ireland Strategic
Committee on Food Surveillance**



Foreword

As Chair of the Northern Ireland Strategic Committee on Food Surveillance it gives me great pleasure to present the second report on the Northern Ireland food sample data held in the Food Surveillance System (United Kingdom) (FSS (UK)) database. The report represents the work, support and assistance from a large number of individuals and organisations to whom I am very grateful.

This report indicates areas of success and demonstrates what can be achieved through a central database which captures the food sampling activities undertaken by the 26 environmental health departments across Northern Ireland. It contains summary details of the outcome of over 9,000 food samples which were obtained by environmental health officers during 2008 for microbiological and chemical analysis. These samples were taken for enforcement/investigation or surveillance/monitoring purposes.

This report focuses only on local sampling but information held on the FSS (UK) database has the potential to enable local, regional and national comparisons to be made and, in consequence, should help facilitate environmental health officers in developing and refining future targeted food sampling programmes.

Food surveillance is an important public health measure. The information contained in this report should reassure the public that the necessary surveillance mechanisms are in place to identify and respond to unsatisfactory sample results. As with our first report this report contains a number of recommendations to further improve food safety compliance and gives an indication of the issues the Committee might explore in future work.

Similar to 2007, the results of sampling in 2008 indicate that there have been relatively few detections of food borne pathogens. However there was an significant outbreak of *Listeria monocytogenes* in 2008 and this is mentioned in the report. There were no other significant foodborne outbreaks reported during the year.

The 2007 report was presented to the Northern Ireland Food Advisory Committee (NIFAC) and we welcome their encouragement, observations and comments which will be considered in future evaluation of sampling outcomes.

I hope this report will be a useful reference document for those professionals and others working in, or with an interest in, food safety. Readers are again reminded that the samples taken for analysis are to support informed enforcement and are not random samples that can be used for detailed statistical analysis or inference or hypothesis testing. Nevertheless it can be used to inform future sampling programmes and food safety initiatives.

Comments on this report are welcomed and should be forwarded to the Food Standards Agency 10a-c Clarendon Road Belfast.

Email: enquiriesni@foodstandards.gsi.gov.uk

A handwritten signature in blue ink that reads "Brian Smyth". The signature is written in a cursive style with a large initial 'B' and a stylized 'S'.

Dr. Brian Smyth

July 2010

Northern Ireland Strategic Committee on Food Surveillance

- Dr. Brian Smyth – Consultant in Health Protection - Public Health Agency
- Mr Mervyn Briggs – Senior Policy Officer – Food Standards Agency in Northern Ireland
- Ms Esther Chartres – Higher Executive Policy Officer – Food Standards Agency in Northern Ireland
- Mr John McKee – Principal Environmental Health Officer – Northern Ireland Food Liaison Group
- Dr. Paul Rooney – Consultant Microbiologist – Northern Ireland Public Health Laboratory, Belfast Health and Social Care Trust
- Mr Ron Ennion – Public Analyst – Eurofins
- Mr Colin Magill – Senior Environmental Health Officer – North Down Borough Council
- Dr. Phillip Donaghy – Consultant in Health Protection – Public Health Agency
- Dr. Liz Mitchell – Deputy Chief Medical Officer – Department of Health and Social Services and Public Safety
- Dr. Cliodhna Foley-Nolan – Director of Human Health and Nutrition - **safefood**

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Executive Summary

The report provides an overview of the microbiological and chemical analysis of food samples recorded on the FSS(UK) database during 2008 by the 26 District Councils in Northern Ireland, and is the second report of the Northern Ireland Strategic Committee on Food Surveillance.

This report for 2008 focuses on the chemical composition and microbiology of over 9000 foods sampled by environmental health officers and sampling officers of District Councils in Northern Ireland and offers :-

- Observations on potential trends in relation to sample results
- An independent evaluation of the existing programmes of food sampling and on the priorities given to sampling certain food types
- Recommendations on the future targeting of District Council food sampling plans.
- Comments on the quality and safety aspects of the food microbiology
- Comments on the scope and nature of the chemical analysis of food
- Examples of actions arising from samples with unsatisfactory results

In 2008, 9314 samples were obtained for analysis and examination.

- 29% of samples examined by the food examiner failed to meet required microbiological standards. Much of this was attributed to quality rather than safety issues as no ready to eat foods (RTE) sampled contained campylobacter or *E. coli* O157. Two RTE samples contained salmonella samples and this subsequently was associated with a product recall across Europe.
- Meat and meat products were the most common food type sampled for microbiological analysis and microbiological quality was generally good but 7% of such samples had high bacterial counts consistent with temperature abuse. Further investigation is required to better define the reasons why

certain food products, particularly meat and meat products, have high bacterial counts. This would aid environmental health officers to support food businesses achieve better microbiological standards.

- Approximately 30% of non prepacked foods failed microbiological standards – higher than with other wrapping options. In the absence of trend data from other years it is not known whether this was atypical but it does require further investigation.

Fifty per cent of food samples analysed by the Public Analyst failed to comply with legal requirements concerning both composition and labelling. This was similar to the findings in last year's report. It is therefore important that food business operators are supported in complying with legislative standards. An example of this support is the production of guidance on food labelling for butchers and bakers.

The process of food sampling conducted by officers is not a random one and relies on a targeted approach based on risk assessment. This is reflected in the priority given to collecting food samples from higher risk rated premises and businesses and the tendency for such samples to be less compliant with microbiological and chemical standards. In consequence the data cannot be used for inference testing.

1 – Introduction

In Northern Ireland food law enforcement is a function of District Councils and is undertaken by environmental health officers or sampling officers, many of whom specialise in food control.

Co-ordination of this work across the District Councils is assisted through the four Group Environmental Health Committees who appoint Principal Environmental Health Officers to monitor and co-ordinate a range of food control activities.

These activities include:

- Inspection of a wide range of food premises and assessment of the risks that they may present to food safety
- Inspection of food business operations and food sampling to assess compliance with food compositional and microbiological standards and labelling
- Investigation of reported cases of food poisoning and taking appropriate action to prevent spread of food poisoning
- Investigation of a wide range of food complaints.

In relation to food sampling the Food Standards Agency provided a central database for the collection of food sample details to facilitate effective and targeted food sampling plans and programmes. Details of the FSS(UK) database can be found in Appendix 1.

As part of this process the Food Standards Agency in Northern Ireland, in consultation with the Northern Ireland Food Liaison Group (NIFLG), recommended the formation of a “Strategic Committee” to advise and inform on food sampling and analysis of food in Northern Ireland. Subsequently in 2007, the Northern Ireland Strategic Committee on Food Surveillance (NISCFS) was established. Details of the work of the Committee may be found in Appendix 2.

Much of the food control work is achieved through a balance of both enforcement and education of food business operators and food handlers. Examples of interventions undertaken by officers to raise awareness of food safety issues, include:

- Highlighting and promoting guidance notes prepared for the food industry
- Seminars and training delivered on such topics as:
 - Hazard Analysis Critical Control Point (HACCP), “Safe Catering”, and “Safer Food Better Business”
 - Allergens awareness
 - Food labelling
 - Marketing terms
- Advice and support including hygiene training and production and distribution of general hygiene information leaflets

This report, however, only focuses on the food sampling activities of environmental health officers in Northern Ireland. It excludes the outcome of feed and food samples taken by officers from DARD Quality Assurance Branch (DARD (QAB)).

Food safety legislation and associated codes of practice indicate that effective routine sampling is an essential element in delivering a well balanced enforcement service and should feature in the enforcement activity of all food authorities.

No fixed sampling and testing frequency has been set down in legislation. In Northern Ireland, the NIFLG recommended to the Chief Environmental Health Officers Group (CEHOG) that chemical sampling rates should be between 1.5 and 2.5/1000 population, dependant on risk. In the absence of an official designated sampling rate this currently serves as a guide for District Councils for sampling and analysis by the Public Analyst. The rate for microbiological food sampling is higher i.e. 8 samples/1000 population.

This report summarises the results of analysis and examination of foods sampled in 2008. The report examines microbiological sample results under the following themes

- Numbers of samples and levels of compliance
- Results by premises and risk classification
- Results by food type
- Results by nature of packaging
- Results by pathogen presence
- Results focusing on seasonality

Chemical sample results are examined under the following general themes.

- Numbers of samples and levels of compliance
- Results by premises and risk classification

The report describes the current trends in sampling practice in Northern Ireland and highlights the potential future direction of sampling activities and identifies areas for specific project work or sampling initiatives for District Councils.

The data represents those samples taken in 2008 for which there was a corresponding result available at 31 December 2008 and which have been entered onto the database. Therefore there may be a small number of samples taken during 2008 which will be excluded from this report.

The dataset also includes a small number of samples taken for specific surveys. It is therefore important to note that as food samples are not selected at random but as part of targeted risk based sampling programmes or surveys the results cannot be used for inference or hypothesis testing. However they can inform future sampling programmes and food safety initiatives.

Throughout the report there are references to terms such as satisfactory, acceptable and unsatisfactory sample results. A fuller explanation of these terms is given in Appendix 3 and the glossary of terms.

2 - Microbiological food examination

2.1 - NUMBERS OF SAMPLES AND LEVELS OF COMPLIANCE

During 2008 authorised district council sampling officers, in the course of routine environmental health work, visited a range of food premises across Northern Ireland and collected 6236 samples for microbiological examination by the Food Examiner as shown in Table 1. This represents 67% of all food samples collected.

Table 1 - Totals/percentages of food samples submitted for microbiological testing indicating contribution to survey work in 2008

Food samples	Non Survey	Survey	Total No. Samples	Percentage survey work
Microbiological examination	6020	216	6236	3.5%
Total (Includes microbiological and chemical samples)	8660	654	9314	7%

Local sampling programmes are based on a number of criteria including;

- Profile of types of premises
- Profile of risk categorisations
- Past compliance history of certain premises types
- Scale of certain food business operations and whether they produce food nationally or internationally.

Most samples were taken as part of routine monitoring and surveillance work or for the purposes of enforcement and investigation. Only a small proportion of food samples collected were part of national and regional surveys. Details of the survey projects and sources of further information where available are set out in Appendix 6.

Since there is only one public health laboratory in Northern Ireland undertaking microbiological examination of food samples provided by District Councils, there is a need to have a planned sampling programme to ensure an even distribution of laboratory work load. This is achieved by District Councils being allocated specific

sampling days. Arrangements also exist to enable increased sampling in the event of a suspected food poisoning outbreak.

The laboratory examines between 300-600 food samples every month with the average number of samples submitted on a monthly basis being in the region of 500. Over holiday periods the number of samples submitted decreases.

Table 2 describes the proportion of samples that were regarded as satisfactory and those as unsatisfactory. The term unsatisfactory covers a very broad range of potential reasons for sample failure and includes failure due to microbiological quality and because of errors in labelling of food exposed or offered for sale (see Appendix 3 for further discussion of “unsatisfactory”).

In 2008, 29.2% of food samples submitted for microbiological examination were reported to be unsatisfactory. A similar figure was identified in 2007 data.

Table 2 - Totals/percentages of food samples reported as satisfactory/unsatisfactory in 2008

Food samples	Satisfactory	% Satisfactory	Unsatisfactory	% Unsatisfactory	Total
Microbiological examination	4413	70.8%	1823	29.2%	6236
Total (Includes microbiological and chemical samples)	5948	63.9%	3366	36.1%	9314

Although 29.2% of samples were reported as microbiologically unsatisfactory it should be noted that much of this is attributed to quality rather than safety issues. The number of reported food pathogens was very small (see section 2.5).

By comparison, figures for Scotland indicate the microbiological percentage sample failure rate at about 23%. Further information on Scottish figures is available in the Scottish report and is available to download at:

<http://www.food.gov.uk/news/newsarchive/2010/jan/sfsr2008>

Table 3 - Totals/percentages of all food samples (chemical and microbiological) taken for enforcement or surveillance purposes in 2008

Food samples	Satisfactory	Percentage	Unsatisfactory	Percentage	Totals
Enforcement/ Investigation	1099	66.9%	543	33.1%	1642
Surveillance/ Monitoring	4849	63.2%	2823	36.8%	7672
Total	5948	63.9%	3366	36.1%	9314

Table 3 shows the overall split between enforcement/investigation and surveillance/monitoring sampling activities. For 2008, 33.1% of samples, sampled for enforcement/investigation purposes failed the required chemical/microbiological standards. Thirty seven per cent of samples, sampled for surveillance/monitoring purposes failed the required chemical/microbiological standards.

Observations

- The percentage failure rate may demonstrate that officers are focusing their attention on particular premises and using sampling as a means of verifying opinions on standards of hygiene in the premises sampled i.e. a risk based targeted sampling approach.
- The food examiner reports serve as a useful tool in persuading food business operators to change poor hygiene practices if detected by officers during sampling activities. On occasion, officers may take multiple samples from a single food premise which could explain the occurrence of higher levels of unsatisfactory results. It is routine practice to issue advice and resample premises with unsatisfactory samples.

2.2 RESULTS BY PREMISES TYPE AND RISK CLASSIFICATION

Food premises are classified into different types depending on the nature of their food operations. Comparisons were made between the type of premises sampled and the levels of compliance with microbiological tests (Table 4).

The pattern of sampling was very similar to 2007 with some additional samples being taken from manufacturing premises.

In 2008 there were fewer samples taken from importers/exporters, distributors or transporters. No samples were taken from packers.

- The majority of microbiological samples were taken from retail and catering premises.
- Samples taken from retail premises had the highest sample failure rate

Table 4 - Distribution of satisfactory and unsatisfactory microbiology samples by premises type

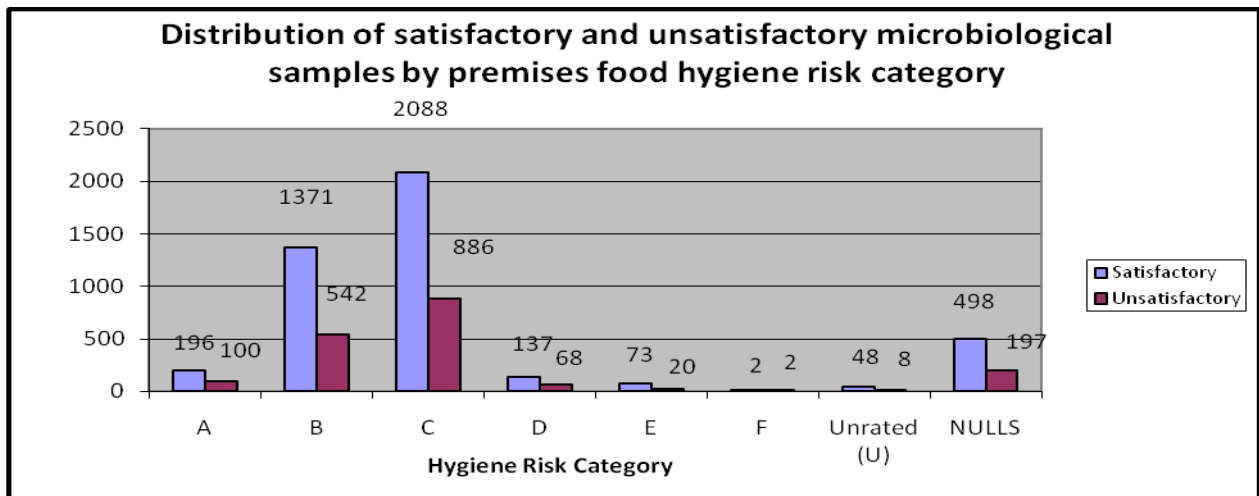
Premises type	Total	No. Satisfactory	No. Unsatisfactory	% Unsatisfactory
Manufacturers/processors	758	558	200	26.4
Importers/Exporters	8	7	1	12.6
Distributors/Transporters	76	66	10	13.2
Retailers	1604	1066	538	33.5
Restaurants and other Caterers	3486	2503	983	28.2
Manufacturers mainly selling by retail	290	203	87	30

Throughout the year Environmental Health Departments issue advisory leaflets to help food business operators improve on microbiological quality and safety of foods that they prepare and sell. A specimen information leaflet is attached at Appendix 8.

If a sample fails a particular standard the officer may issue an advice guidance note to the food business operator. Depending on the sample result, the officer may resample the food or carry out a visit or follow up inspection.

For the purposes of the Food Law Code of Practice environmental health officers use an intervention hygiene risk rating category system to determine the frequency of inspections. Those at highest risk have a higher frequency of inspections. Figure 1 describes the food sampling microbiological outcome by premise hygiene risk category with A representing the highest risk premises.

Figure 1 - Distribution of satisfactory and unsatisfactory microbiological samples by premises food hygiene risk category (2008)



This revealed the following:

- The majority of food premises sampled fall within the hygiene risk categories of B and C
- 296 samples were taken from A category premises and 34% failed the required standard – a higher proportion compared to other risk category premises
- Fewer samples were taken from category “D” premises compared with 2007.
- 56 samples came from premises that were unrated. However the majority (86%) of these samples passed microbiological tests
- 695 samples submitted did not have details of the risk classification of the premises sampled (“Nulls”).

Observation

- Premises with the highest risk rating (“A”) tended to have a higher rate of unsatisfactory microbiological samples. This is consistent with the risk stratification scheme and supports a targeted risk based sampling approach
- The absence of recorded details of risk categories associated with certain premises was noted in last year’s report. This is now a mandatory field in the database and the number of “Null” entries will progressively decrease.

2.3 RESULTS BY RANGE OF FOOD TYPES SAMPLED

For official food control purposes foods are classified into over 20 categories which are further subdivided.

As in 2007, meat and meat products and prepared dishes are the most frequently sampled food for microbiological examination irrespective of the reason for sampling.

Fruit and vegetables are also frequently sampled. This typically includes food items such as fresh, frozen and processed fruit and vegetables including salad pots and coleslaw.

Table 5 outlines the top five foods sampled during 2008.

Table 5- The top 5 food types sampled in Northern Ireland for microbiological examination by reason for sampling

Microbiological food Enforcement/Investigation	Microbiological food Surveillance/Monitoring
<ul style="list-style-type: none">• Meat and meat products• Prepared dishes• Fruit and vegetables• Soup, broth & sauce• Egg and egg products	<ul style="list-style-type: none">• Meat and meat products• Prepared dishes• Fruit and vegetables• Soup, broths and sauces• Egg and Egg products

Food types failing the required standard

Table 6 ranks the categories associated with failing microbiological standards. The major food types failing microbiological tests in 2008 were meat and meat products and prepared dishes which represent the greatest proportion of food types sampled.

In general bacterial counts of less than 10^3 colony forming units/gram would be regarded by the Food Examiner as satisfactory. It should also be noted that for grades between 10^3 to 10^7 colony forming units/gram certain food types have identifiable standards in the guidance document. For the purposes of this report it is reasonable to generally conclude that as the total count of colony forming units rises the microbiological quality falls. There are however, certain exceptions; for example, in the case of foods that would be fermented or are composite and contain components that would have a high total bacterial count e.g. yoghurt.

The significance of looking at bacterial quality is that given correct conditions any pathogenic bacteria will multiply and, in the case of some bacteria where the infectivity is dose related, it is essential their numbers are kept as low as possible. This can be achieved through good standards of hygiene, preparation, cooking, cooling and refrigeration. Assessment of bacterial counts enables officers to evaluate the risk presented by a particular food taking into account other factors identified from hygiene inspections.

The microbial quality of meat and meat products is highlighted in Figure 2 as this is the most commonly sampled food category.

Figure 2- Total bacterial count for Meat and Meat Products, Game and Poultry

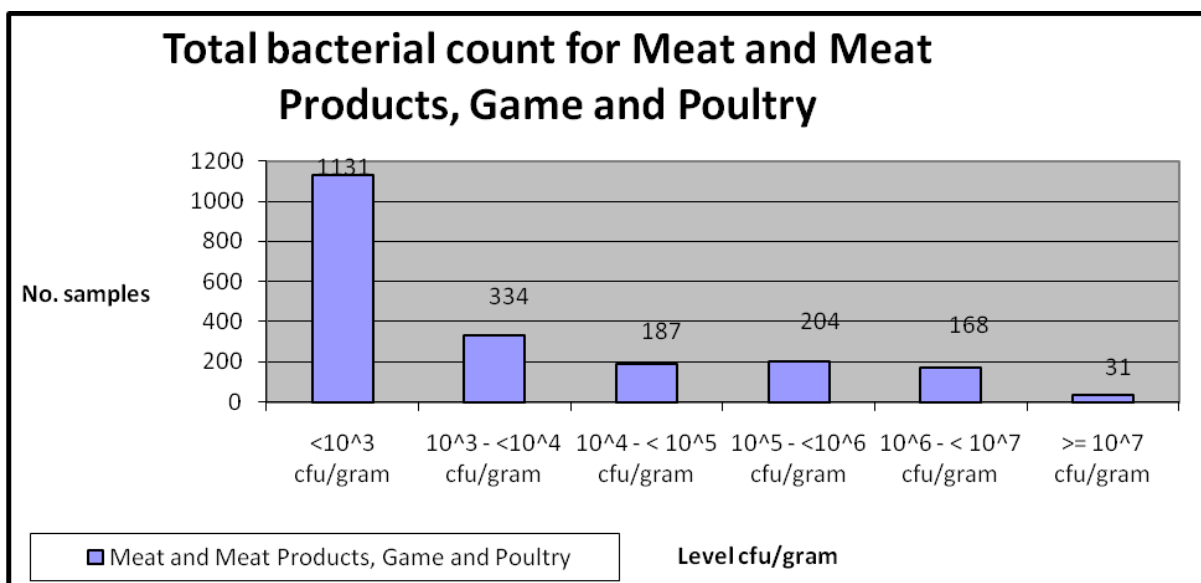


Figure 2 indicates that the microbiological quality of meat and meat products is generally good. There is however evidence showing that some samples are likely to have been subject to temperature abuse with reported levels of bacteria on occasions exceeding 1×10^6 colony forming units per gram (cfu/g).

This might not be an unusual occurrence if the meat samples analysed were fermented meats, however, during 2008 only a proportion of samples (8 in total) were fermented meats including salami, pepperoni, haslet and smoked sausage collected for microbiological examination. All had counts less than 10^7 cfu/g. There is therefore, no reason to explain why 168 (7%) samples of meat and meat products had bacterial counts greater than 10^6 cfu/g, and 31 samples with bacterial counts great than 10^7 cfu/g.

High bacterial counts in cooked meats could reflect some or all of the following:

- Poor refrigeration of product on display or storage
- Poor temperature control in the distribution chain
- Poor handling practices
- Inadequate cooking

Appendix 4 (Figures 7-13) give an indication of the range of bacterial counts for different food types. Foods with a bacterial count of 10^6 cfu/g or more included:

- Prepared dishes (94 of 1258 samples (7.4%))
- Bakery products and cereals (15 of 201 samples (7.4%))
- Fruit and vegetables (58 of 827 samples (7%))
- Egg and egg products (10 of 281 samples (3.5%))
- Fish and shellfish (16 of 221 samples (7.2%))
- Cakes and confectionery (30 of 94 samples (31.9%)) (the reason for higher bacterial counts in this category is due to the fact that they contain cream).

Over 200 samples of meat and meat products and prepared dishes had total bacterial counts over 1 million cfu/g yet were reported as being collected at 8

degrees centigrade or less. These were taken from retail premises, restaurants and other caterers. (Appendix 4 - Figures 17 & 18). This finding requires further investigation.

Consideration was also given as to whether there might be a relationship between the country of origin of the foods being sampled and the total bacterial counts. However, in the absence of clear definitions and accurate information from food labels it was not possible to undertake this comparison.

Recommendations

- Further investigation is required to better define the reasons why certain food products, particularly meat and meat products, have high bacterial counts.
- The proportion of samples found outside temperature control should be compared between the different UK administrations.
- District Councils should continue to review types of intervention and advice notes to enable food businesses achieve better microbiological standards
- Future FSS (UK) reports for Northern Ireland should compare and contrast the microbiology of different foods either pre packed or sold loose.
- The FSS advice notes defining “Country of Origin” for samples should be reviewed.

2.4 RESULTS BY NATURE OF PACKAGING OF FOOD

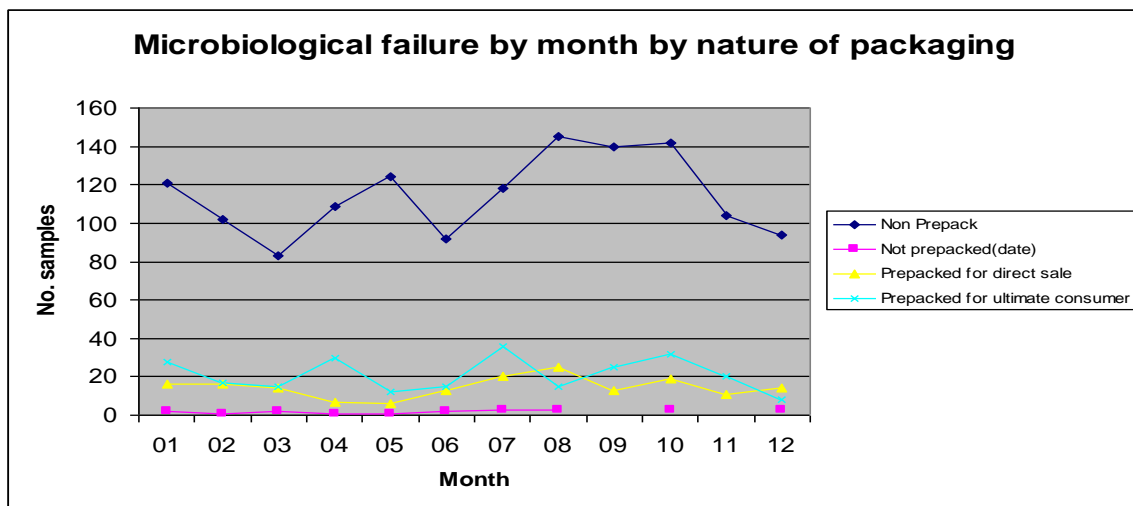
Information concerning the nature of packaging is also gathered by the officers during sampling. There are four categories in respect of packaging which are;

- Non prepacked;
- Non prepacked but with a use by date provided;
- Prepacked for direct sale; and
- Prepacked for the ultimate consumer.

A comparison was made regarding monthly sample failures and the nature of the packaging of the food (Figure 3).

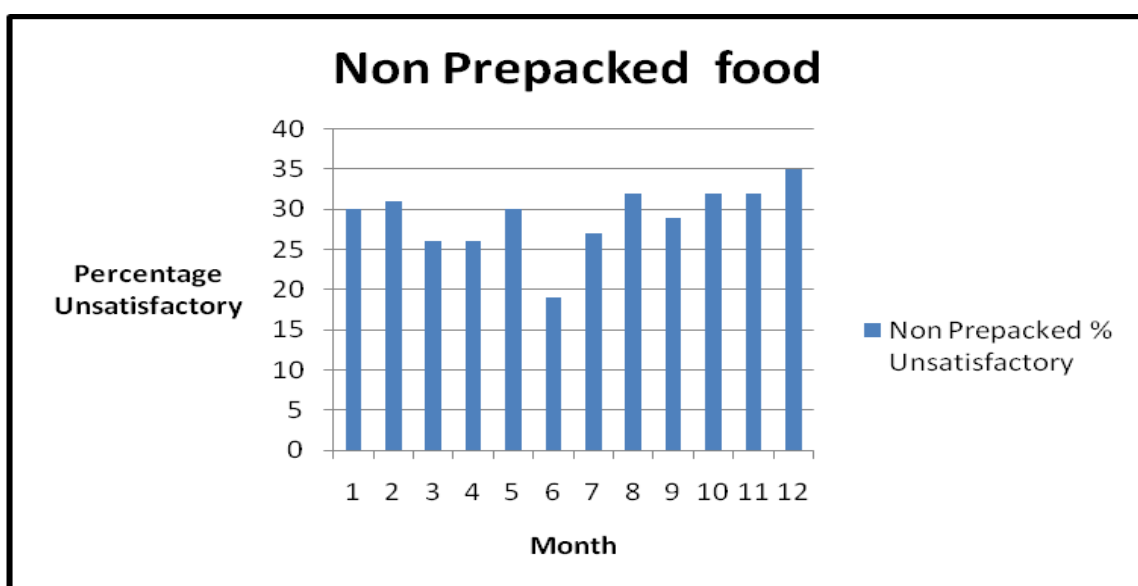
There are more non prepacked or unwrapped samples failing microbiological tests than any of the other wrapping options. For these non pre-packed foods there appeared to be an increased trend in unsatisfactory samples between June to October in 2008.

Figure 3 - Microbiological failure by month by nature of packaging



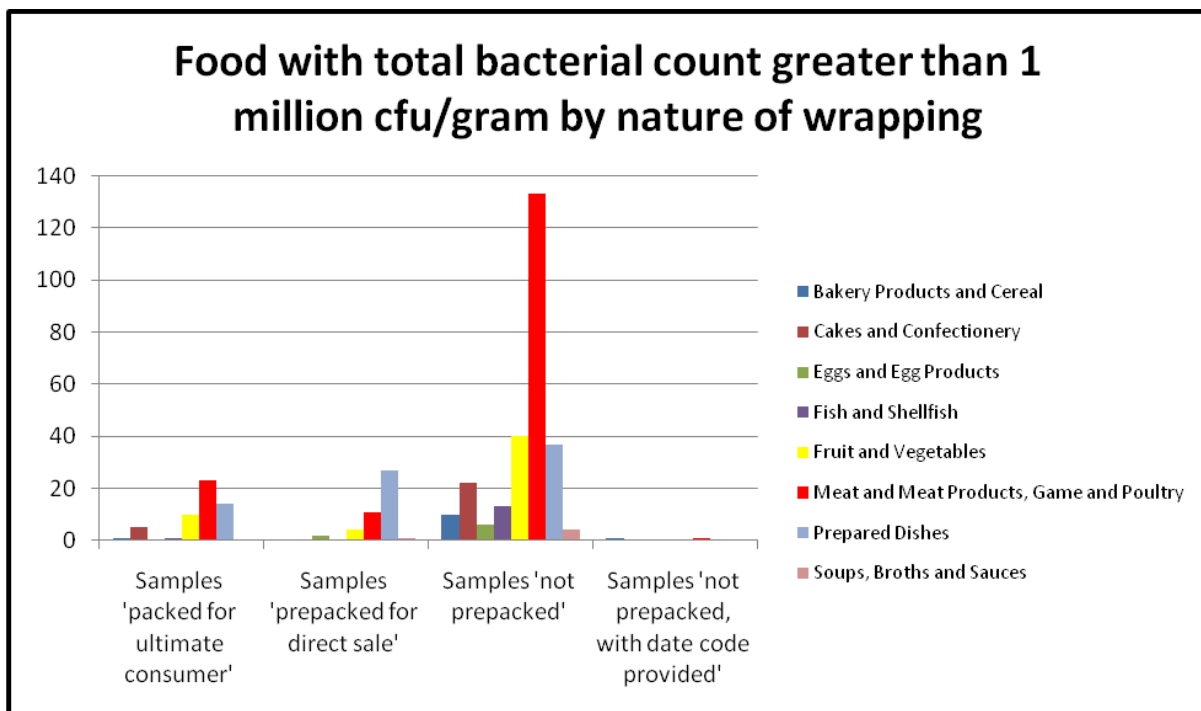
The data was examined by month from a percentage failure perspective for non pre-packed foods (Figure 4)

Figure 4 - Non Prepacked Food (microbiological failure by month)



The graph indicates that the failure rates tended to be slightly higher in the July/December period than for the first six months of the year. A similar pattern was noted with samples of food prepacked for the ultimate consumer and those prepacked for direct sale (Appendix 4, Figure 14-16). However in the absence of trend data from other years it is difficult to comment further. Nevertheless this is worthy of further investigation.

Figure 5 – Foods with total bacterial counts greater than 1 million cfu/gram by nature of wrapping.



The category fruit and vegetables includes

- Fresh, frozen and processed fruit
- Protein foods including milk and novel foods
- Canned and processed vegetables and
- Fresh and frozen vegetables

Based on sampling results and descriptions of the method of wrapping it is notable that the following foods that were not prepacked were more likely to be associated with poor total bacterial counts.

- Meat and meat products

- Prepared dishes
- Fruit and vegetable products and
- Cakes and confectionery

Observations

- The evidence suggests that officers are justified in their choice of foods to be sampled.
- It is not possible to draw any major conclusions regarding the variation in failure rates for the different forms of wrapping and packaging of food as officers use sampling as a tool to reinforce hygiene messages. However, there is merit in looking at a larger dataset with further years' data.

Recommendation

- Over the next 5 years the NIFLG should consider further investigation based on the outcome of the evaluation of a larger dataset in order to inform guidance and advice to food business operators.

2.5 RESULTS BY PATHOGEN PRESENCE

Food samples are examined to detect the following food poisoning pathogens (details of which are set out in the glossary)

- *Salmonella*
- *Campylobacter*
- *E. coli 0157*
- *Listeria*
- *Clostridium perfringens*
- *Staphylococcus aureus*
- *Bacillus cereus*

Salmonella

During 2008, 5640 food samples were examined for the presence of *Salmonella* bacteria. There were 4 food types containing *Salmonella*.

Table 7 – Distribution of pathogens identified in food samples.

	Salmonella	Campylobacter	<i>E.coli</i> 0157
Samples examined	5640	322	60
Detected	4	0	0

The foods in which salmonella were detected are set out in Table 8 with corresponding actions taken by officers.

Table 8 - Actions taken in respect of foods found to contain Salmonella.

Food description	Salmonella species	Actions
Mini Chorizo	<i>S.derby</i>	Not RTE food as indicated on the food label (See note)
Mini Chorizo	Un-named	Not RTE food as indicated on the food label (See note)
Steak Pieces (two samples)	<i>S. agona</i>	The sample related to a batch of food made in the Republic of Ireland. Following detailed investigation the manufacturer conducted a product recall across Europe.

Note: When a ready to eat (RTE) food sample is found to contain a pathogenic bacteria or bacteria at harmful levels the Food Examiner will alert the sampling officer who will visit the premises and take appropriate action which can range from

- Request for certain foods to be withdrawn from sale
- Food alert being issued by FSA
- Detention and or seizure of contaminated food.

Mini Chorizo

The two samples of mini chorizo were examined on the basis that they were ready-to-eat products. However, on closer examination of both products, the labels included instructions for cooking prior to consumption which would therefore destroy any pathogenic bacteria. Officers took the view that the labelling was not very clear and this was drawn to the attention of the Food Standards Agency, the Home Authority for the manufacturer, and the retailer.

***Campylobacter* and *E. coli* 0157**

No samples were found to contain *E-coli* 0157 or *Campylobacter*.

Listeria

Listeria monocytogenes is one of the five key organisms against which the Food Standards Agency has been monitoring progress in reducing foodborne disease in recent years. The number of cases of listeriosis in the United Kingdom increased markedly in 2003 and, whilst there has been a subsequent gradual decrease, reports are still much higher than they were in the 1990's. Most of this increase is accounted for by non-pregnancy associated cases involving other vulnerable groups, particularly the elderly. Since listeriosis has a high mortality rate, it is important that any potential food source of listeria is identified.

Listeriosis remains an uncommon diagnosis in Northern Ireland with between two and six cases reported annually since 2000. The majority of cases have been aged 60 years or older. However, an outbreak occurred in the Belfast Health and Social Care Trust during May to November 2008. Seven cases were reported including three deaths. All had very significant co-morbidity.

This was a highly complex investigation and a possible link was found between four of the outbreak cases and sandwiches potentially available to hospital inpatients during the outbreak period. This is now the seventh outbreak in the UK to be potentially linked with sandwiches supplied to hospitals. Despite intensive investigation three cases remain with no link to any foodstuffs investigated and it is unclear whether these cases are part of the same outbreak or represent a separate outbreak from a different source of contamination.

A more detailed report on the investigation can be found on the Public Health Agency Web site: <http://www.publichealth.hscni.net/publications>

Explanation of the different methods of detection:

L.monocytogenes is quite common in raw foods and the food environment. The organism can survive and grow at refrigerated temperatures but is destroyed by adequate cooking. For ready-to-eat foods, four food safety criteria have been defined (under Regulation (EC) No 2073/2005), establishing different limits according to the potential for the food to support growth of the organism. To assess compliance with these criteria, two tests are routinely undertaken by the official control laboratories; *L.monocytogenes* enumeration test (conducted on retail samples collected during their shelf-life) and the *L.monocytogenes* detection test (conducted at the end of manufacture and for products that have a long shelf-life under refrigeration). Regulation (EC) No. 2073, requires that ready-to-eat foods capable of supporting the growth of *L.monocytogenes* should not contain *L.monocytogenes* at levels exceeding 100 cfu/g throughout shelf-life.

As a result of this outbreak an increased number of foods were sampled for Listeria species during 2008. Of the 5072 samples analysed, nine were found to have significant levels of *Listeria monocytogenes*, 8 of which were unsatisfactory and potentially injurious to health. Many of these samples were tested on enrichment to help identify the source of the outbreak. This technique is not routinely used and could partly explain the higher level of detection of Listeria species during 2008.

Table 9 gives a breakdown of the different foods found to contain Listeria species some of which were *Listeria monocytogenes*.

Table 9 – Foods in which *Listeria* species were identified (through enumeration tests) and reported as potentially hazardous.

Food item	Species
Sliced ham	<i>L.monocytogenes</i> and <i>L.seeligeri</i>
Cooked ham	<i>L.monocytogenes</i> and <i>L.seeligeri</i>
Ear and tongue roll	<i>L.monocytogenes</i> and <i>L.welshimeri</i>
Ear and tongue roll	Listeria species
Ear and tongue roll	<i>L.monocytogenes</i>
Ear and tongue roll	<i>L.monocytogenes</i>
Tongue roll	<i>L.monocytogenes</i> and <i>L.welshimeri</i>
Tongue roll	<i>L.monocytogenes</i>
Noodle	<i>L.seeligeri</i>

Contaminated ear and tongue roll originating from Lithuania and supplied in Northern Ireland was removed from sale following its detection. A food alert in relation to this matter was issued by the Food Standards Agency.

Guidelines from the Public Health Laboratory Service (PHLS) (the forerunner of the Health Protection Agency) indicate how samples containing *Listeria* should be classified. Table 10 outlines the number of cfu/g and the corresponding classification for *Listeria monocytogenes* and other *Listeria* species.

Table 10 - *Listeria* species identified by premises type (by enumeration method)

Premises type	20-100 cfu/gram	>100 cfu/gram
Primary Producers	0	0
Manufacturers/processors	0	0
Importers/Exporters	0	0
Distributors/Transporters	0	0
Retailers	0	7
Restaurants and other Caterers	1	1
Manufacturers mainly selling by retail	0	0

Table 11 demonstrates, the number of samples screened in Northern Ireland for presence of *Listeria* species using the detection method in 25 gram.

Table 11- Listeria species detected by food type (by detection in 25 grams method)

Food Type	Detected
Dairy Products	2
Eggs and Egg Products	2
Fish and Shellfish	1
Fruit and Vegetables	1
Meat and meat products, Game and Poultry	23
Prepared Dishes	13
Others	21
Total	63

Bacillus cereus

During 2008 there were 30 food samples found to contain *Bacillus cereus* organisms.

Specific foods found to contain *Bacillus cereus* bacteria were:

- Bakery products and cereals
- Herbs and spices
- Prepared dishes

These samples were obtained mainly from restaurants, catering premises and distributors. (See Figure 2 Appendix 4)

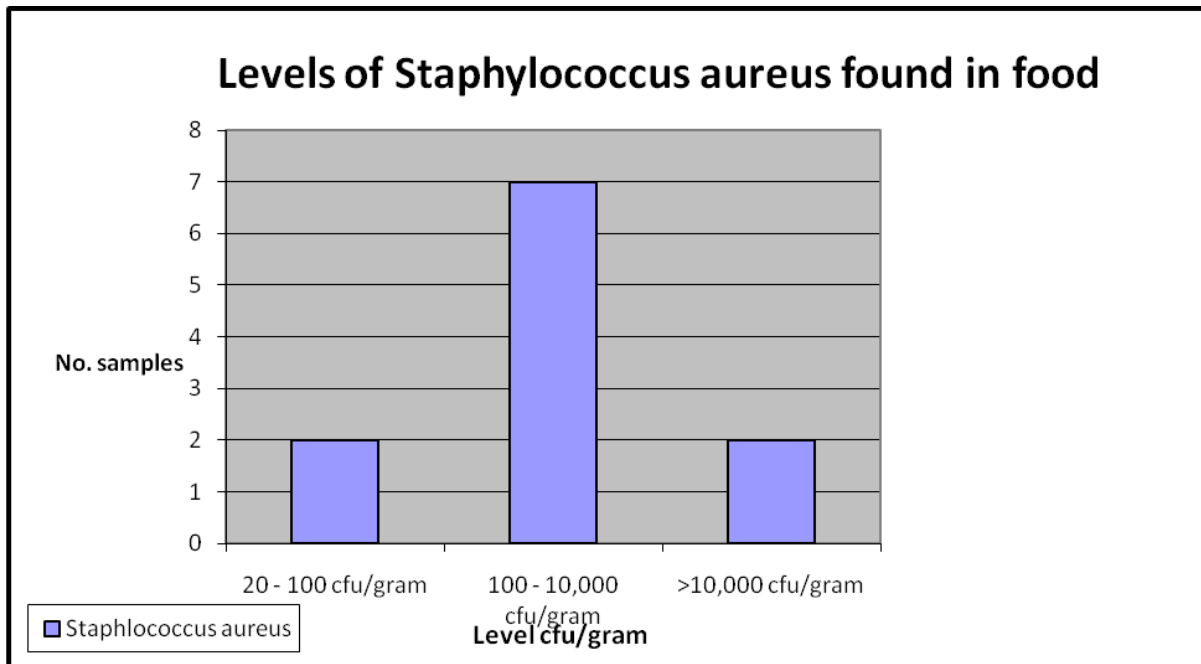
Five of the samples were potentially hazardous with levels above 100,000 cfu/gram. The occurrence of these higher levels of *Bacillus cereus* in food was investigated and appropriate action taken.

Staphylococcus aureus

In 2008 there were two samples of food (one tuna and one mayo) that had high levels i.e > 10,000cfu/gram of *Staphylococcus* bacteria.

When such results are reported to environmental health officers the food type is normally re sampled following the issue of general advice and guidance.

Figure 6 – Levels of *Staphylococcus aureus* found in food



Clostridium perfringens

During 2008 a number of foods were examined for the presence of *E.coli* indicator organisms.

Two food samples were reported with elevated levels of *Clostridium perfringens*. These were spaghetti and vegetable quiche.

These organisms can be found in food but the numbers of samples with levels above 100 cfu/gram were small.

Non Pathogenic *E. coli*

Non pathogenic *E.coli* are bacteria that are also used as an indicator of the general standard of hygiene in relation to food. Their origin is faecal and therefore they can indicate a number of poor practices linked to

- Cross contamination
- Poor cooking
- Poor personal hygiene of food handlers

E.coli were found in a range of foods. There were 17 samples of prepared dishes and bakery products and cereal that were found to have levels greater than 100 cfu/gram and these samples came mainly from restaurants and other caterers, retailers and manufacturer processors (Figure 6 Appendix 4).

Enterobacteriaceae

In addition to looking for pathogens in food the Food Examiner also looks for certain bacteria, for example *enterobacteriaceae*, that can be used as an indicator of general hygiene practices in food premises.

Food types found to contain *Enterobacteriaceae* at levels above 10,000 cfu/gram were meat and meat products, prepared dishes and fruit and vegetables (Appendix 4 - Figure 3).

Premises associated with food samples containing *Enterobacteriaceae* at levels above 10,000cfu/gram were mainly restaurants, other caterers and retail premises (Appendix 4 - Figure 4).

Observations

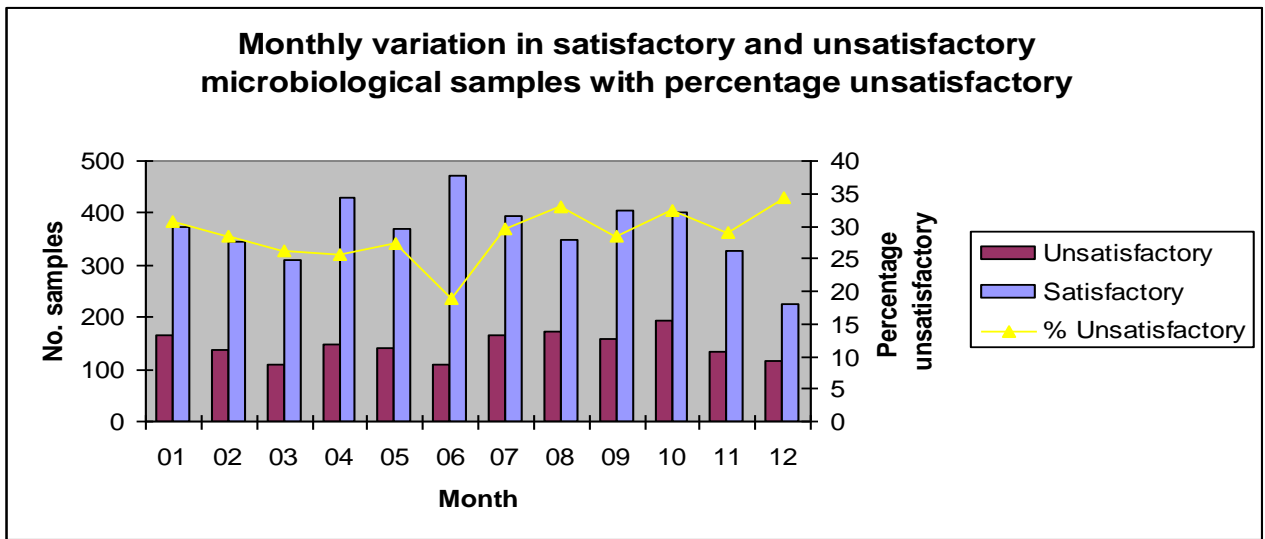
Whilst the number of food samples with elevated levels of these indicator organisms are low the test for their presence serves as a tool to allow officers to highlight the importance of personal hygiene to food business operators and food handlers.

2.6 RESULTS FOCUSING ON SEASONALITY ISSUES

Information on sampling dates and results has enabled comparisons of satisfactory and unsatisfactory results over time.

Figure 7 outlines the variation in sample results (all premises) by month i.e. the unsatisfactory rate is generally 30-35% but in 2008 tended to be higher later in the year.

Figure 7 - Monthly variation in satisfactory and unsatisfactory microbiological samples with percentage unsatisfactory



Observations

- Sample failure rates by month showed an unexpected variation with higher unsatisfactory rates in the July/December period.

Recommendation

- It is recommended that as the database grows it may be possible to look at seasonal trends but covering a larger sampling time period.

3 - Chemical Food Analysis

3.1 - NUMBER OF SAMPLES AND LEVELS OF COMPLIANCE

A total of 3078 samples were obtained for chemical analysis and taken as part of routine planned sampling.

Table 12 - Totals/percentages of food samples submitted for chemical analysis indicating contribution to survey work in 2008

Food samples	Non Survey	Survey	Total No. Samples	Percentage survey work
Chemical analysis	2640	438	3078	14%
Total (Includes microbiological and chemical samples)	8660	654	9314	7%

The majority of samples were taken as part of routine sampling and 14% (438 samples) were taken as part of survey work occurring regionally and nationally. Appendix 6 lists the various survey work undertaken in 2008.

Food was analysed for compliance with compositional standards and labelling. It should be noted, however that any type of labelling irregularity is reported as a sample failure for the purposes of FSS (UK) and therefore a number of unsatisfactory sample results could be attributed to labelling errors. As in the previous year 50% of the food samples submitted for chemical analysis were reported as unsatisfactory.

Table 13 - Totals/percentages of food samples reported as satisfactory/unsatisfactory in 2008

Food samples	Satisfactory	% Satisfactory	Unsatisfactory	% Unsatisfactory	Total
Chemical analysis	1535	49.9%	1543	50.1%	3078
Total (Includes microbiological and chemical samples)	5948	63.9%	3366	36.1%	9314

In 2008 routine surveillance sampling activities were focused on the following food types

- Meat and meat products
- Bakery products and cereal
- Prepared dishes and
- Cakes and confectionery

These are food categories that tend to be made locally in butcheries and bakeries, retail, and catering outlets.

Food types sampled as part of enforcement and investigation work included

- Meat and meat products
- Prepared dishes
- Drinks
- Cakes and confectionery

Samples that failed to comply with the chemical analysis including labelling irregularities are summarised in Table 14.

Table 14 - The top four foods failing chemical analysis

Samples taken for Enforcement /Investigation	Samples taken for Surveillance/Monitoring
<ul style="list-style-type: none"> • Meat and meat products • Cakes and confectionery • Bakery products and cereal • Prepared dishes 	<ul style="list-style-type: none"> • Meat and meat products • Prepared dishes • Cakes and confectionery • Bakery products and cereal

3.2 – RESULTS BY PREMISES TYPE AND RISK CLASSIFICATION

The relationships between the type of premises being sampled and the analytical compliance were examined and details are summarised in Table 15.

- In 2008 few samples were taken from primary producers, packers, importers, exporters and materials and articles suppliers

- Manufacturers selling by retail are the most frequently sampled followed by retailers
- The premises type most likely to fail to achieve analytical compliance were retailers and manufacturers selling by retail

The pattern was similar in respect of food sampling in 2007.

Table 15 - Distribution of satisfactory and unsatisfactory chemical samples by premises type

Premises types	No. Satisfactory	No. Unsatisfactory	% Unsatisfactory within category
Manufacturers/Processors	431	396	47.9
Packers	16	5	23.8
Distributors/Transporters	50	48	50
Retailers	422	569	57.4
Restaurants and other Caterers	230	141	38.0
Manufacturers mainly selling by retail	369	372	50.2
Manufacturers of food contact materials	2	0	0
Importers	3	4	57

The majority of food samples taken for chemical analysis were from retailers, restaurants and other caterers, manufacturers and manufacturers selling mainly by retail.

Premises identified with poorer analytical compliance were manufacturers selling mainly by retail (50%), retailers (57%) and manufacturer processors (47%).

As the number of samples taken is concentrated on these particular areas it is apparent that the current focus on sampling is justified and this profile should be kept under observation.

The number of satisfactory and unsatisfactory analytical samples were compared with the food premises risk classification with "A" being the highest risk classification. The information is presented in Table 16.

The higher the premises risk classification the higher the unsatisfactory rate for that particular class of premises.

The sample results also confirmed a higher number of NULLS e.g. samples without risk classification (297) which was higher than that reported in 2007. This is expected to decrease in subsequent years as a result of making this a mandatory field in the database.

The sample failure profile indicates that, as expected, a slightly higher percentage failure would be anticipated in respect of the higher risk premises in comparison with lower risk premises. This further emphasises the risk classification approach, targeted sampling and the ability to examine sampling outcomes by premises risk classification.

Table 16 - Percentage failed samples within stated premises risk category

Premises classification	risk	No. unsatisfactory samples	No.Satisfactory samples	% unsatisfactory within classification
A		134	97	58.0
B		877	861	50.5
C		357	426	45.6
Unrated		12	17	41.4
NULLS		163	134	54.9

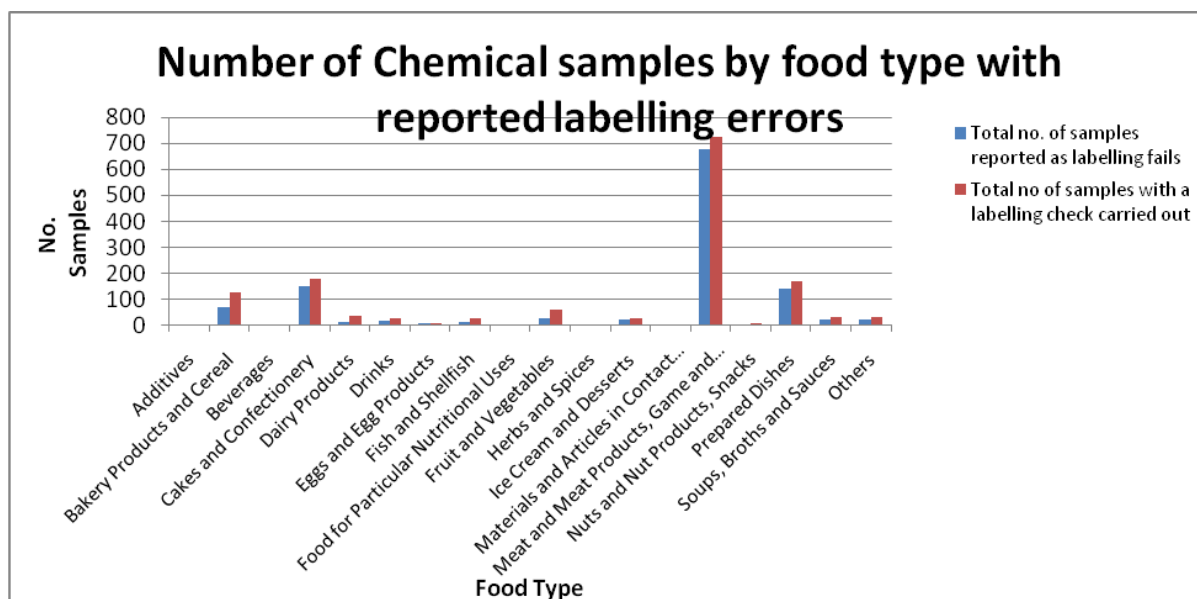
Recommendation

- NIFLG should consider recommending to District Councils to review their sampling plans to cover appropriate sampling of importers and materials and articles in contact with food manufacturers.

3.3 - REASONS FOR CHEMICAL SAMPLE FAILURE

The food type most frequently found to have labelling faults was meat and meat products as shown in Figure 8.

Figure 8 - Number of chemical samples by food type with reported labelling errors



As there were significant numbers of samples failing composition and labelling requirements the data was examined to establish reasons for such failures. The chemical sample results verified that in 2008

- over 450 samples of meat and meat products failed to comply with QUID and other statutory declarations.
- over 100 samples of meat and meat products were not properly named or described
- over 300 samples consisting of meat and meat products, cakes and confectionery and prepared dishes had unsatisfactory ingredient lists

Observation

It should be noted that the needs of consumers as regards accurate and intelligible labelling are, if anything, greater in the current economic climate. Legitimate businesses should be striving to comply with legislative requirements, and appropriate steps must be taken to facilitate and encourage them to this end. NIFLG are actively producing guidance for butchers and bakers to help inform them about better food labelling.

4 – Conclusions

Throughout the year considerable resources are spent on food sampling for the purposes of informing the enforcement authorities that food businesses are meeting statutory standards for hygiene and safety in relation to their particular food operations and for compositional analysis.

Microbiological food examination

The number of foods and ingredients sampled are wide ranging and it is reassuring to note that a very high percentage of ready to eat foods have been found to be free from pathogenic bacteria. There is evidence of the presence of *Listeria* species in some ready to eat foods, albeit at low levels, and as such their occurrence in food is being monitored. It is also reassuring to note that the microbiological examination of foods sourced from retail and catering establishments, which form the largest premises category, were found to contain relatively few pathogenic organisms based on sampling work in 2008.

The Northern Ireland Strategic Committee on Food Surveillance was aware of environmental health officers working with NIFLG in local, regional and national surveys to help highlight trends in food microbiology. Such work has and will continue to inform enforcement authorities and FSA in NI on the safety of food offered for or prepared for human consumption.

Chemical analysis of food

It is also apparent from this analysis that certain groups of food manufacturers and manufacturers selling by retail are failing to comply with the labelling requirements for prepacked foods, particularly ingredients.

The level of detail from the database regarding chemical analysis is limited but NISCFS understands new outcome codes may be introduced which should ensure more detailed information is available.

FSS (UK) database

The database has been operational since early 2007 and already it is identifying possible trends and associations for further investigation. As the database expands both in terms of geographical coverage within the UK and in the number/type of foods sampled and their outcomes it will further add to knowledge on food safety.

5 – Recommendations

The Northern Ireland Strategic Committee on Food Surveillance make the following recommendations based on the information contained in this report.

Microbiological sampling recommendations

- Further investigation is required to better define the reasons why certain food products, particularly meat and meat products, have high bacterial counts.
- The proportion of samples found outside temperature control should be compared between the different UK administrations.
- Future FSS (UK) reports for Northern Ireland should compare and contrast the microbiology of different foods either pre packed or sold loose.
- District Councils should continue to review types of intervention and advice notes to enable food businesses achieve better microbiological standards
- The FSS advice notes defining “Country of Origin” for samples should be reviewed.
- Over the next 5 years the NIFLG should consider further investigation based on the outcome of the evaluation of a larger data set in order to inform guidance and advice to food business operators.
- It is recommended that as the database grows it may be possible to look at seasonal trends but covering a larger sampling time period.

Chemical sampling recommendations

- NIFLG should consider recommending to District Councils to review their sampling plans to cover appropriate sampling of importers and materials and articles in contact with food manufacturers.
- NIFLG should continue to offer support to food business operators to enable better compliance with labelling requirements

General recommendations

- The level of detail available from the database regarding chemical analysis of food is limited but NISCFS understands that there are proposals to introduce new enhanced outcome codes that will ensure more detailed analysis for foods sampled for chemical analysis. NISCFS welcomes this enhancement of the database.

6 - Reference documents for further information

Practical Sampling Guidance for food standards and feeding stuffs
(www.food.gov.uk/multimedia/pdfs/samplingguidance_part1.pdf)

Practical Sampling Guidance for food standards and feeding stuffs
(www.food.gov.uk/multimedia/pdfs/samplingguidance_part2.pdf)

LACORS “Guidance on Food Sampling for Microbiological Examination” 2002
(www.lacors.gov.uk)

Food Safety Code of Practice

The Framework Agreement on Local Authority Food Law Enforcement.

Northern Ireland Food Liaison Group Guidance on microbiological and chemical sampling. “Food Sampling Policies and Associated Guidance”

Food – Inspection, “Guideline for Official Sampling” (European Working Community for food Inspection and Consumer Protection (EWFC)

(www.ewfc.org/pdf/Leitlinienproben-GB.pdf)

Guidelines for the preservation of official samples for analysis No. 36 2002 Campden and Chorleywood Food Research Association Group.

Commission of European Communities Guidance Document (13 Nov 2006) on Official controls under EC Regulation No. 882/2004 concerning the microbiological sampling and testing of foodstuffs.

(http://ec.europa.eu/food/food/controls/foodfeed/sampling_testing.pdf)

Food Sampling Policies –Food Standards NIFLG August 2008.

7 - Acknowledgements

Health Protection Scotland
Northern Ireland Public Health Laboratory
Northern Ireland Food Liaison Group
Eurofins
Food Standards Agency in Northern Ireland
District Council Environmental Health Practitioners
Safefood

Appendix 1

The United Kingdom Food Surveillance System

In Northern Ireland the Environmental Health Officers of the 26 District Councils participate in and use the FSS (UK) database to record details of samples they collected from food premises for analysis and examination.

The database was developed by Health Protection Scotland (HPS) who were commissioned by the Food Standards Agency to deliver the software across the United Kingdom within a 3-5 year period. HPS provides project management, user support, maintenance and development of the FSS (UK) to local authorities in England, Scotland and all the District Councils in Northern Ireland.

The specific aim of the FSS (UK) is to provide a robust food surveillance system for the UK, which will deliver added value by permitting key stakeholders to compare local data within a regional and national perspective.

The database was developed to provide a standardised data capture, storage, querying and reporting functionality for the microbiological and chemical analysis of food samples. At the close of 2006 the Northern Ireland Public Health Laboratory and the Public Analyst's office in Belfast were introduced to the FSS (UK) and District Councils started submitting their sample information from early 2007. The database is now being used on an ongoing basis by EHOs to process and track food sample history.

FSS (UK) is able to collect validated sample data across Great Britain and Northern Ireland for food and animal feeds for enforcement authorities but at present feed and food sample details obtained by DARD (QAB) who have enforcement responsibilities in feed establishments and dairies are not currently recorded on the database.

Appendix 2

The Northern Ireland Strategic Committee on Food Surveillance

Background

The formation of a Strategic Committee was one of the recommendations of the Food Surveillance System Implementation Board to ensure that appropriate governance arrangements are in place in relation to the use and publication of data collected and stored on the Northern Ireland Food Surveillance System database (NIFSS).

Purpose

- (a) To provide the necessary assurances to FSA in NI on analysis and interpretation of data extracted from the food surveillance database
- (b) Produce an annual report on the sampling activities of district councils in N.I. and make recommendations and
- (c) Consider targeted or risk based sampling programmes.

Appendix 3

Sampling and analysis arrangements in Northern Ireland

As there is such a wide and diverse range of foods and ingredients that could be sampled, enforcement officers must focus on risk based sampling. Risk is the likelihood of the occurrence of any fault with food that may in any way be detrimental to the health of the consumer. When determining risk based sampling a number of factors are taken into consideration and typically these include:

- The premises risk rating for both food hygiene and standards. The risk is a measure of how well a food business is complying with the law. The higher the risk the greater the frequency of inspection and consideration for sampling
- Past history of compliance with hygiene and standards legislation
- Past history of food premises in respect of sample compliance
- New or novel food types or new food businesses may present their own unique problems or risks
- Premises involvement in food poisoning incidents
- Complexity of the food manufacturing process, method of processing and nature of the food and scale of the operation
- Food business operator access to specialist knowledge on hygiene and standards relating to food composition
- Local issues and when to sample, e.g. some food operations may be seasonal and some authorities may have significant Home Authority responsibilities
- Information from Rapid Alert Systems for Feed and Food (RASFF). The rapid alert system provides up to date information on food sampled across Europe which fail to meet feed and food safety requirements.

Environmental health officers who wish to obtain information on microbiological food contamination must submit the food sample(s) to an official control laboratory for food control purposes. Laboratories used for the microbiological examination of food must be accredited to a recognised standard and for food control purposes,

recognised by the EC. In Northern Ireland the Food Examiner appointed by District Councils is based at the Northern Ireland Public Health Laboratory.

Where regulatory standards apply, the results of microbiological testing are interpreted by the Food Examiner according to the requirements of Regulation EC No. 2073/2004. Additionally, the results of microbiological sampling of ready to eat foods not covered by the Regulation are compared with Health Protection Agency [guidelines](#).

For the purposes of foods examined in 2008 by the Food Examiner the results are interpreted as one of the four grades of microbiological quality and these are detailed as follows:

- **‘Satisfactory’.**
- **‘Acceptable’.**
- **‘Unsatisfactory’.**
- **‘Unacceptable / potentially hazardous’.**

For the purposes of the FSS (UK) database samples that have been recorded as ‘Acceptable’ by the laboratory are regarded as ‘Unsatisfactory’ and counted as such in the database.

Environmental health officers who wish to obtain information concerning the labelling and composition of food will submit food samples to a Public Analyst who, like the Food Examiner is a qualified person who is appointed under the provisions of the Food Safety (Sampling and Qualifications) Regulations (NI) 1991. In Northern Ireland, Eurofins is the official control laboratory appointed by District Councils to analyse food samples for compliance with composition and labelling legislation.

The Public Analyst has an extensive remit in terms of analysis of food and this includes:

- Food composition and adulteration
- Labelling and mis-description

- Additives and contaminants
- Transfer into food of components of materials and articles in contact with food, e.g. wrappings
- Nutrition information
- Novel foods composition and labelling
- Complaints about the fitness, nature, substance and quality of food

Appendix 4

Additional microbiological sample data

Figure 1 Profile of microbiological sampling through the year

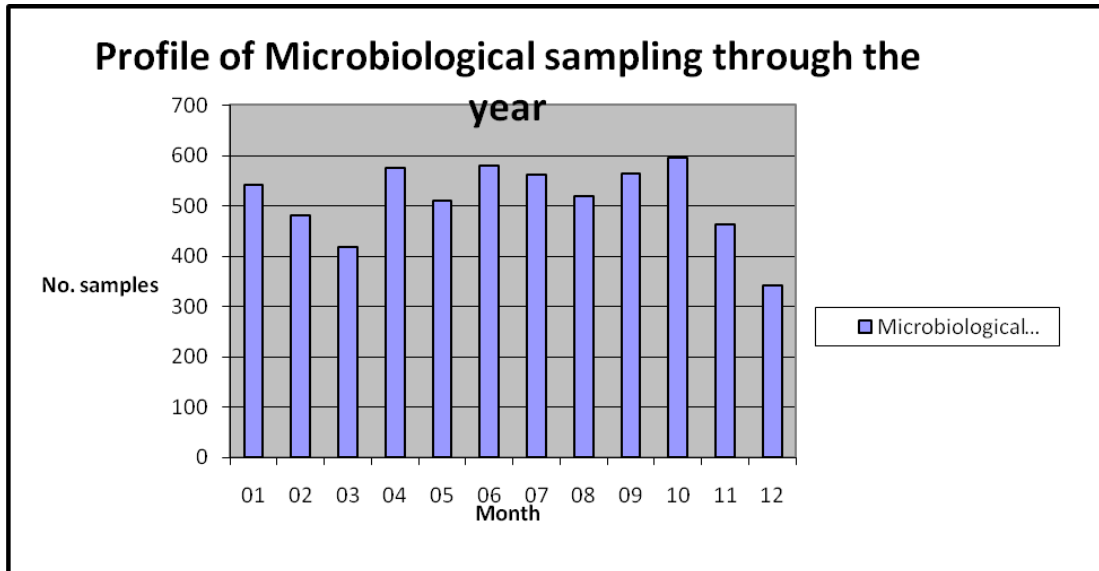


Figure 2 Distribution of Bacillus in food premises at levels above 1000 cfu/gram

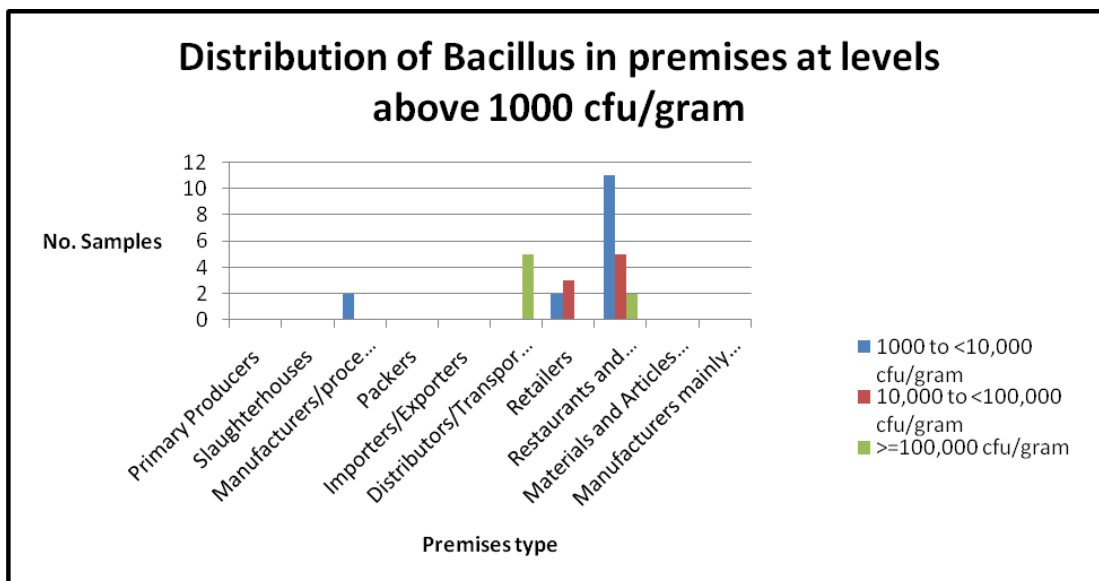


Figure 3 Distribution of *Enterobacteriaceae* in foods at levels above 100 cfu/gram.

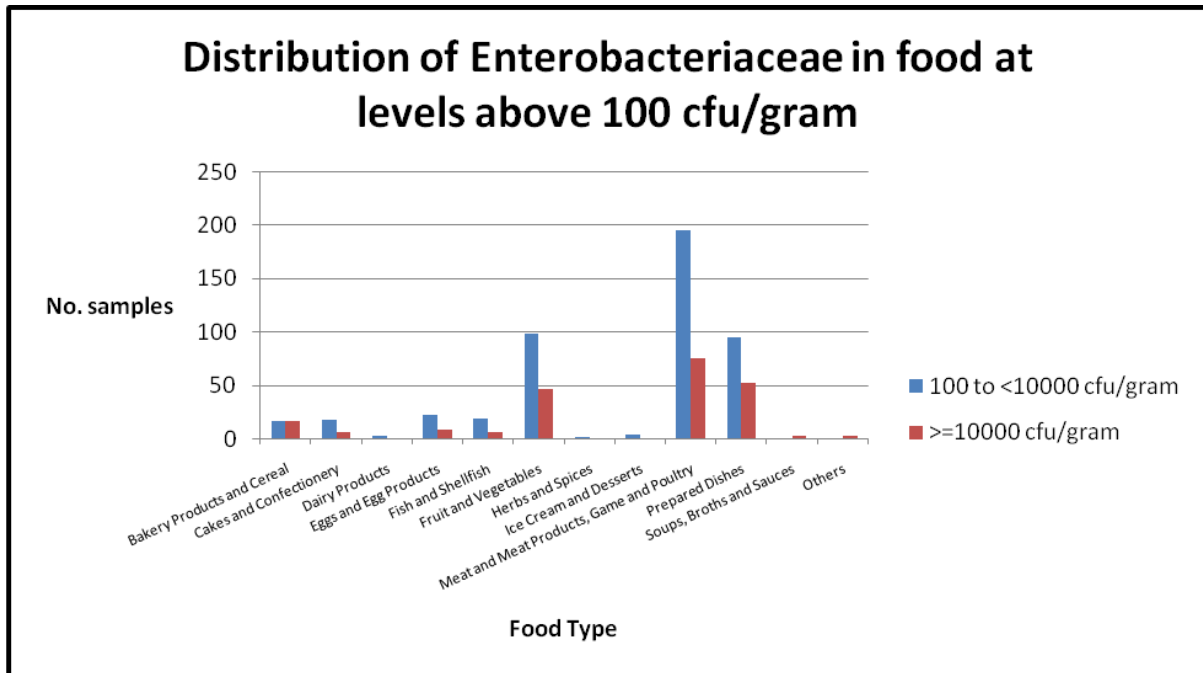


Figure 4 Distribution of *Enterobacteriaceae* in foods by premises type at levels above 100 cfu/gram.

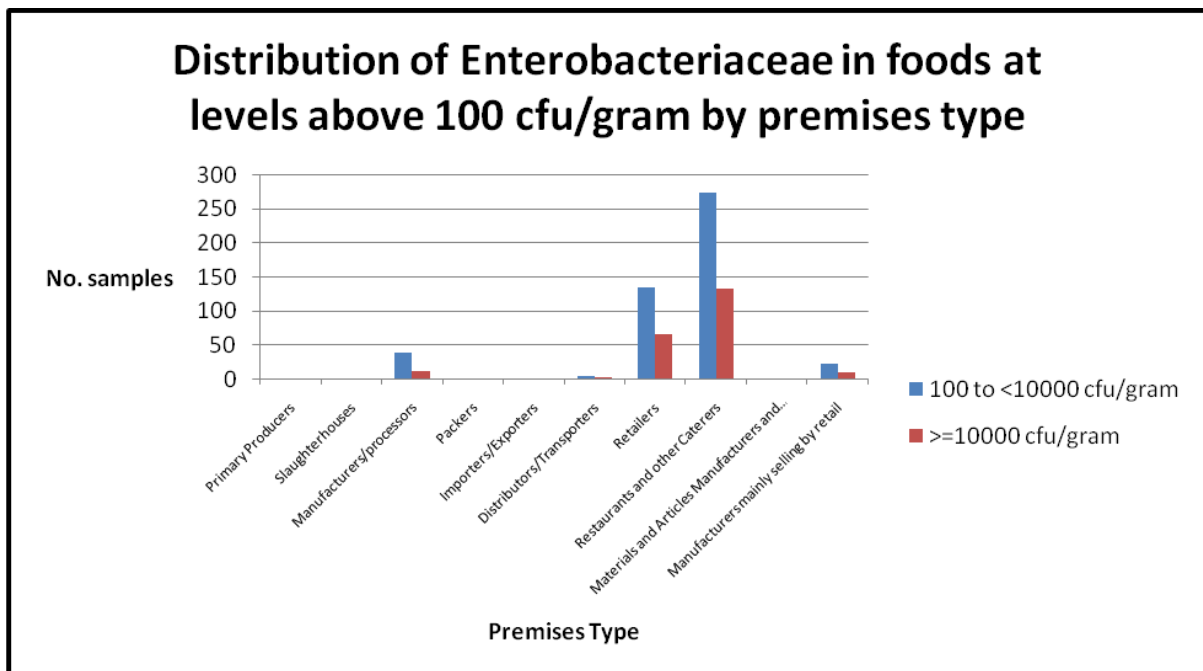


Figure 5 Distribution of *E.coli* in food at levels above 20 cfu/gram

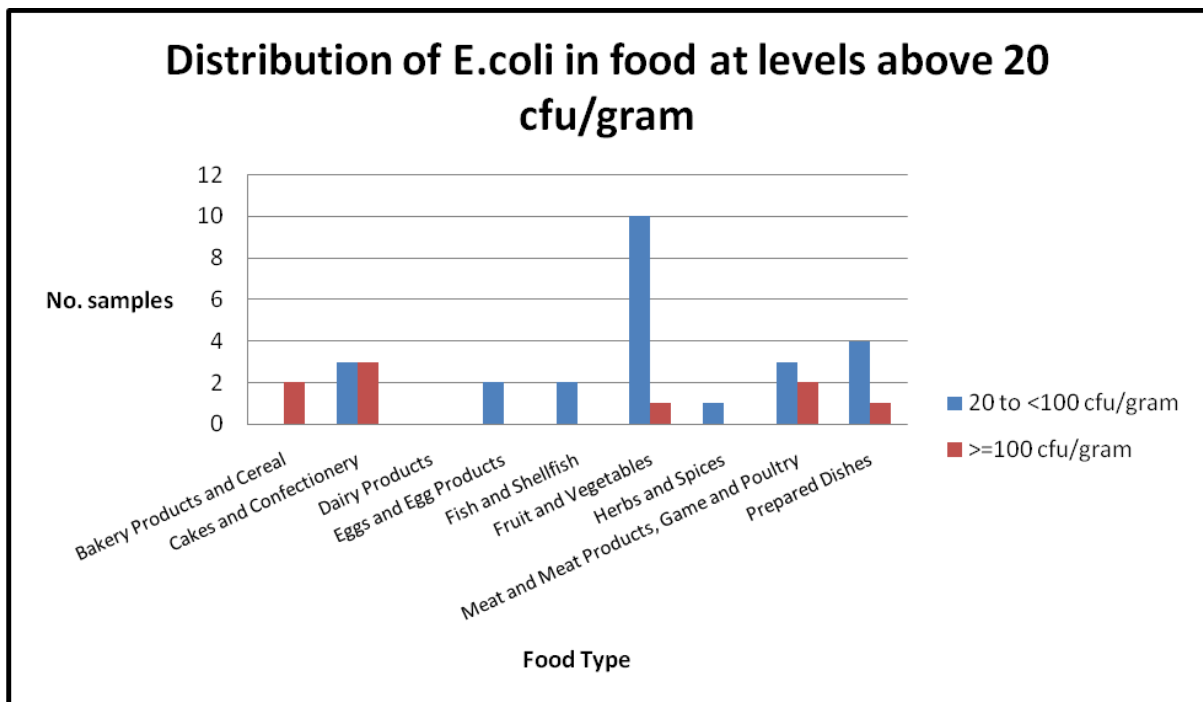
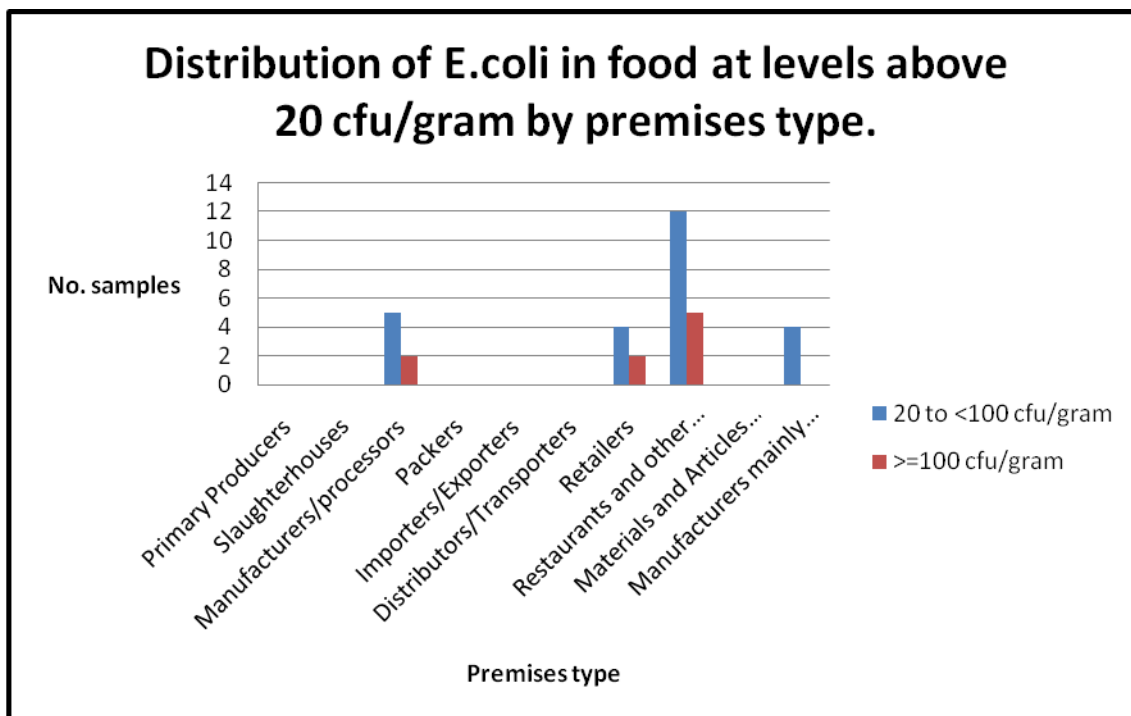


Figure 6 – Distribution of *E.coli* in food at levels above 20 cfu/gram by premises type



Microbiological quality of food

Figure 7 – Total bacterial count for prepared dishes

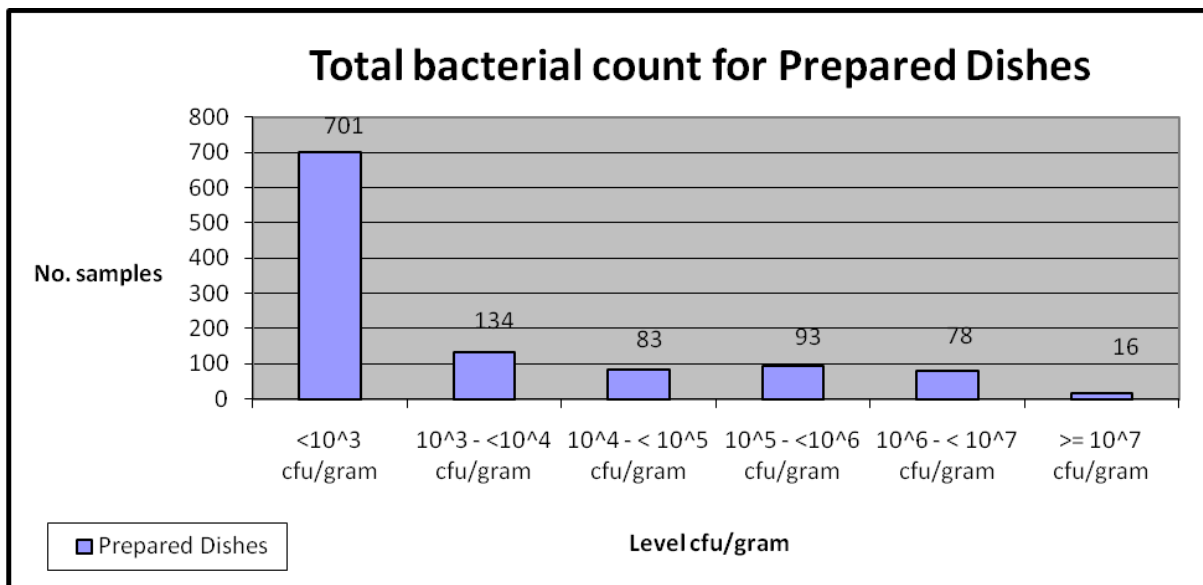


Figure 8 – Total bacterial count for dairy products

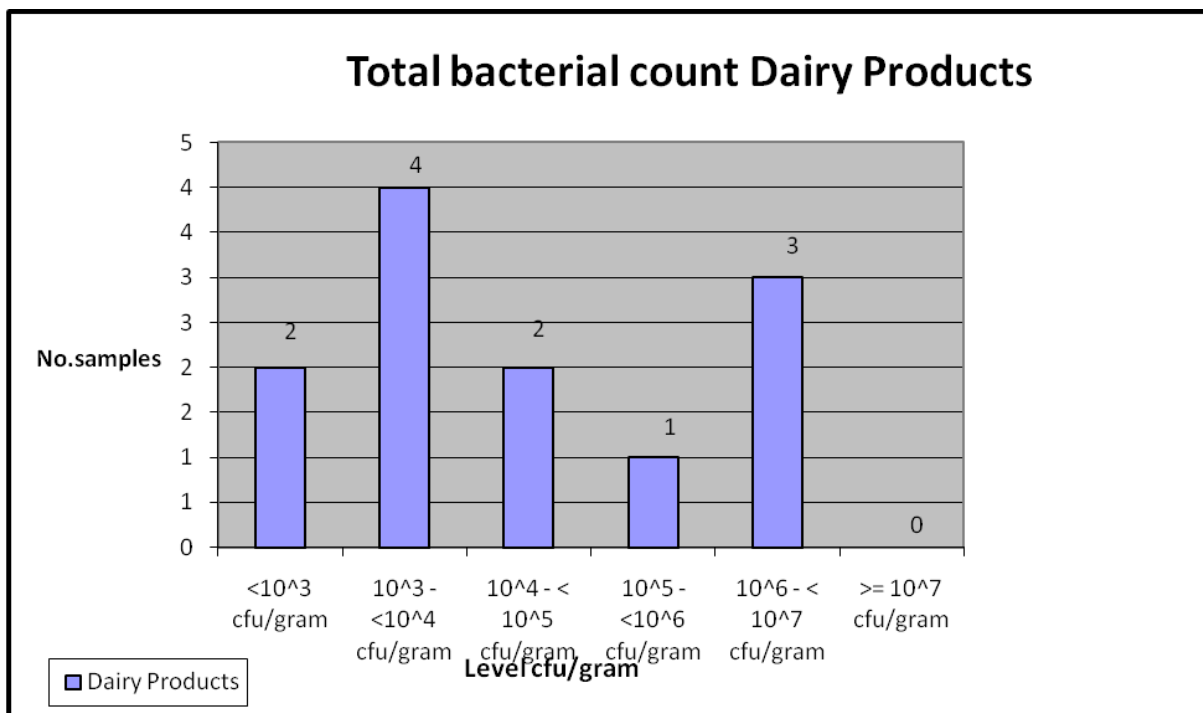


Figure 9 – Total bacterial count for bakery products and cereal

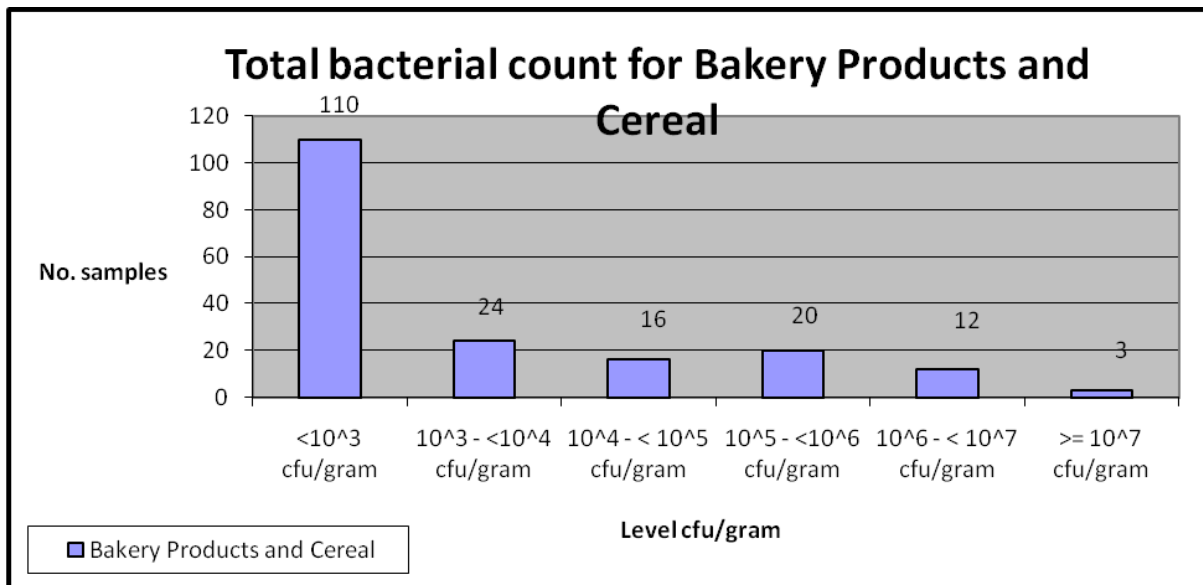
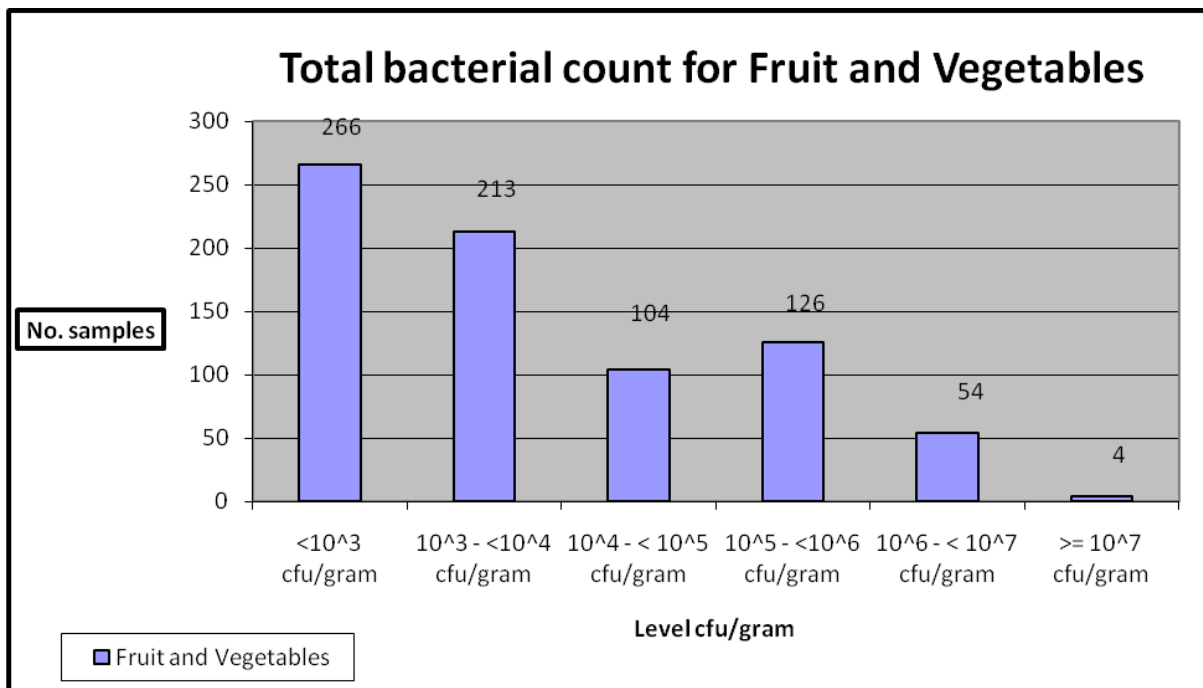


Figure 10 – Total bacterial count for fruit and vegetables



Note: Typical foods in this category include:

- Fresh, frozen, canned and dried fruit
- Fresh, frozen, dried and prepared vegetable including salad and coleslaw

Figure 11 – Total bacterial count for eggs and egg products

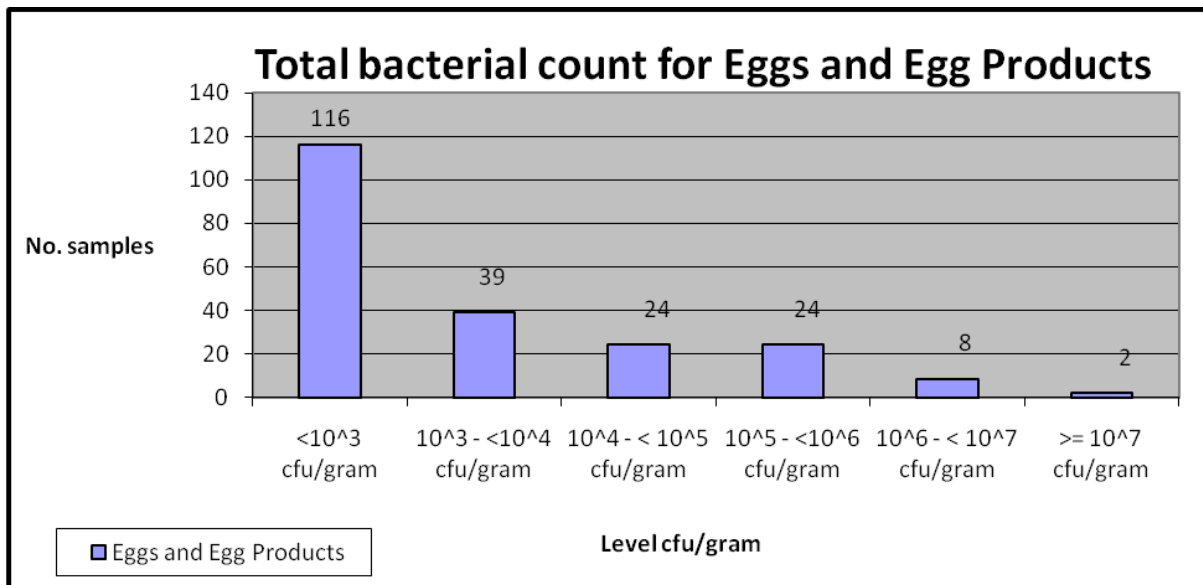


Figure 12 – Total bacterial count for fish and shellfish

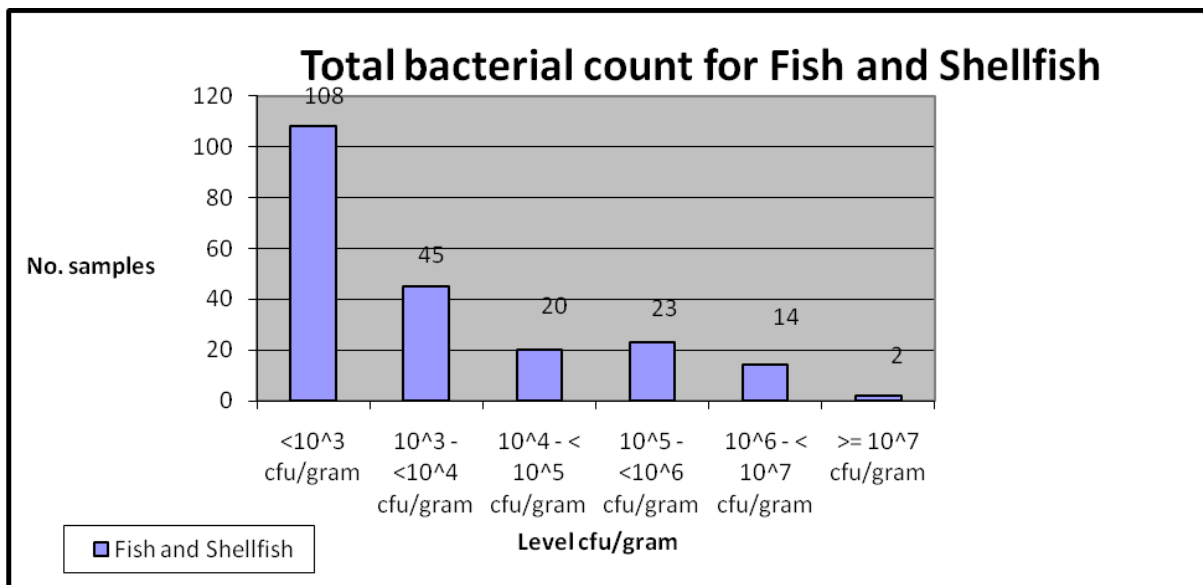


Figure 13 Total bacterial count for cakes and confectionery

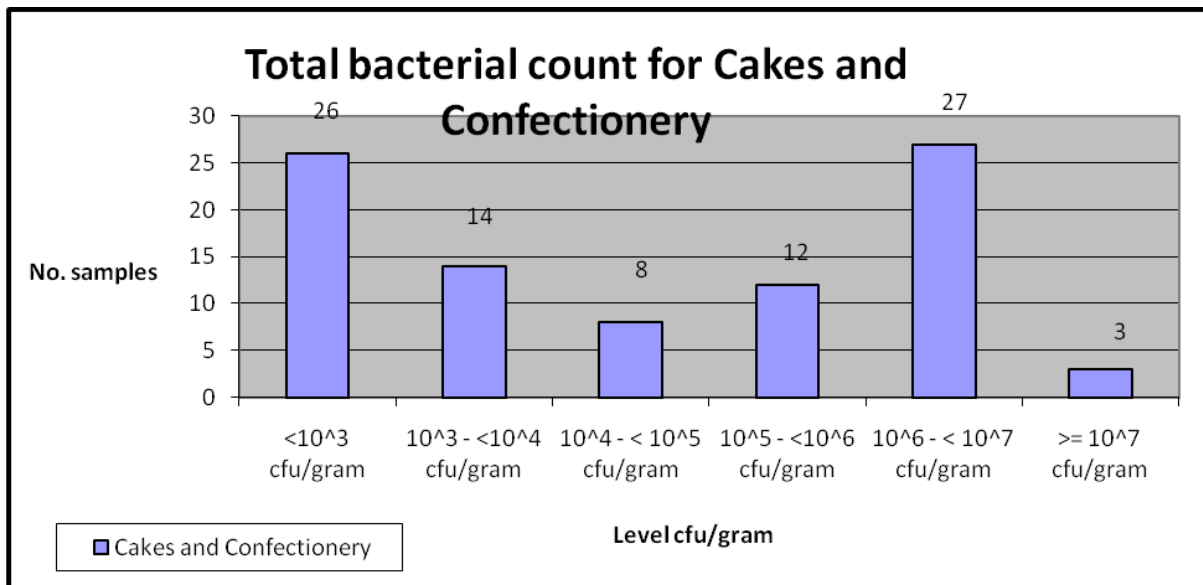


Figure 14 Prepacked for ultimate consumer (relationship between nature of packaging of food and monthly percentage of unsatisfactory results)

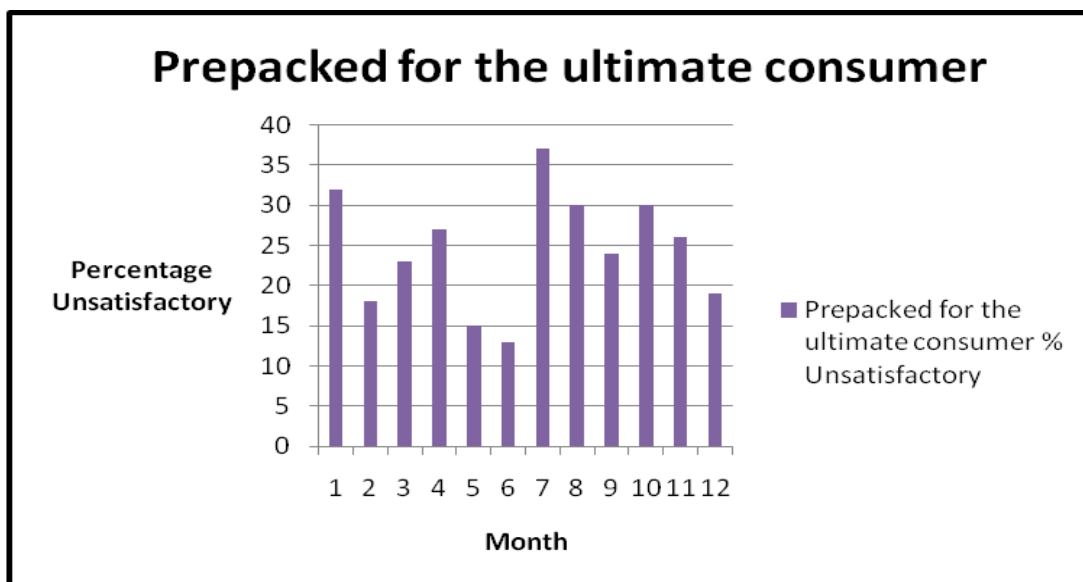


Figure 15 Prepacked for direct sale (relationship between nature of packaging of food and monthly percentage of unsatisfactory results)

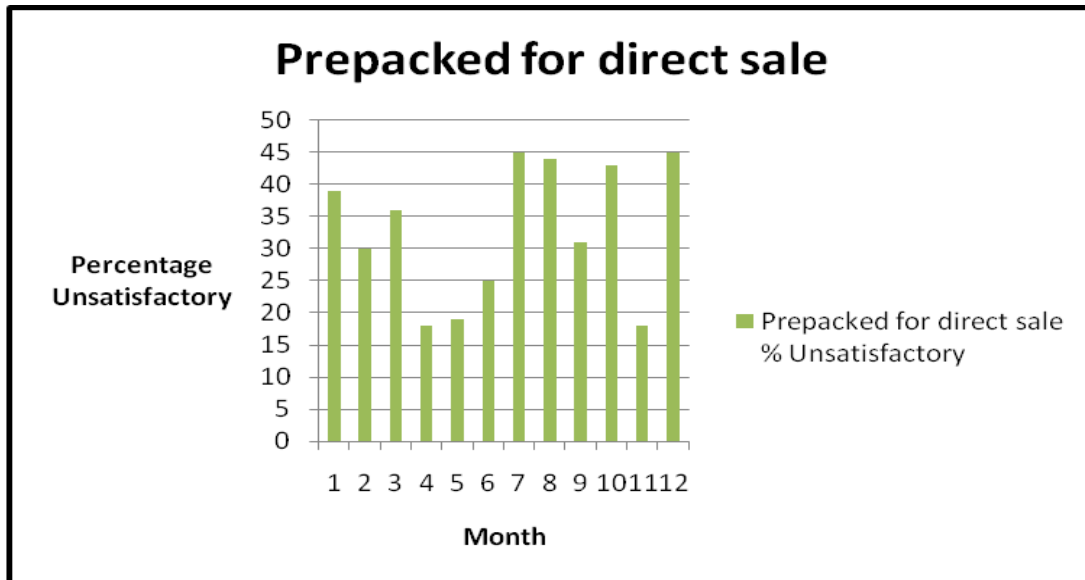
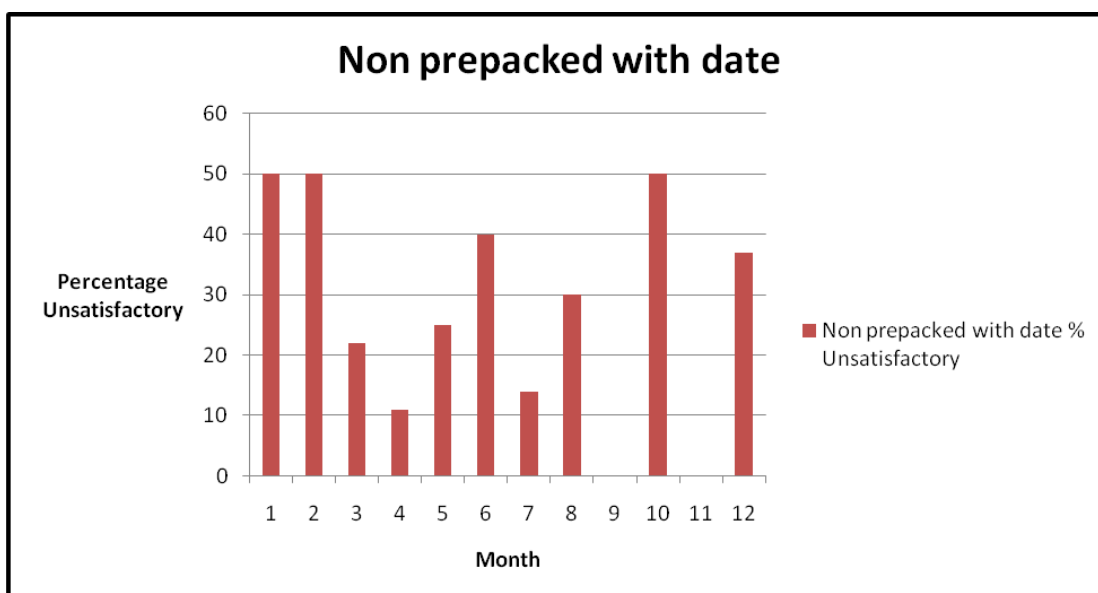
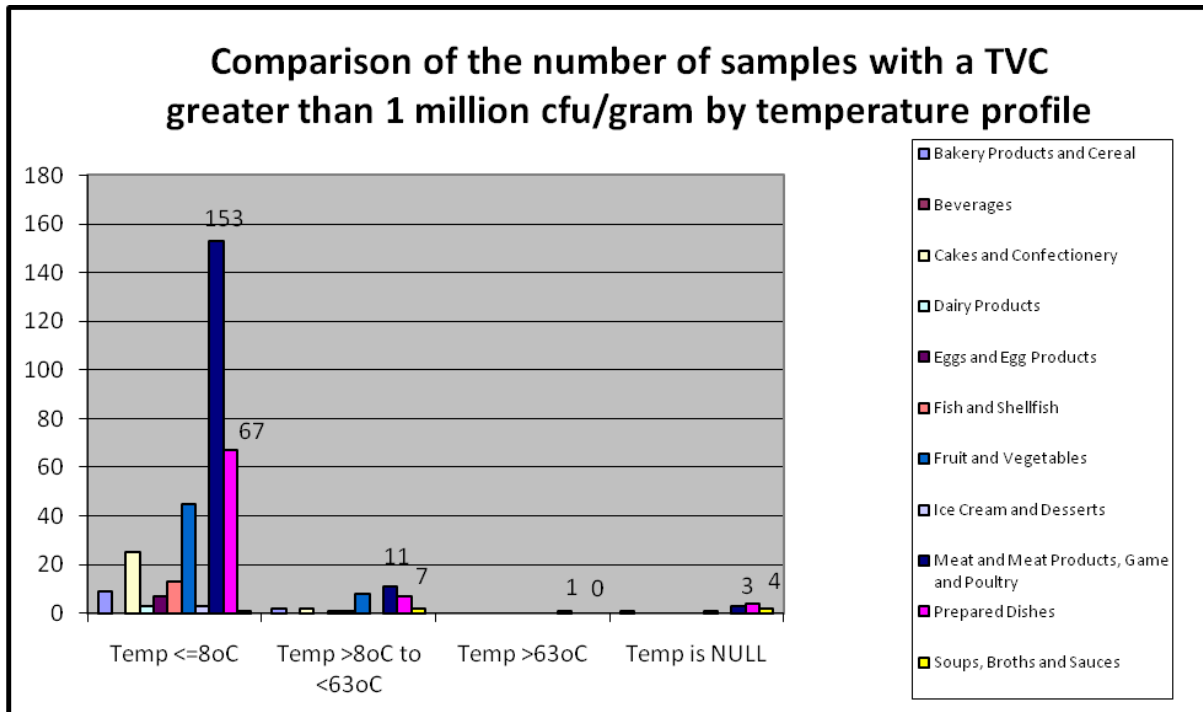


Figure 16 Non prepacked with date (relationship between nature of packaging of food and monthly percentage of unsatisfactory results)



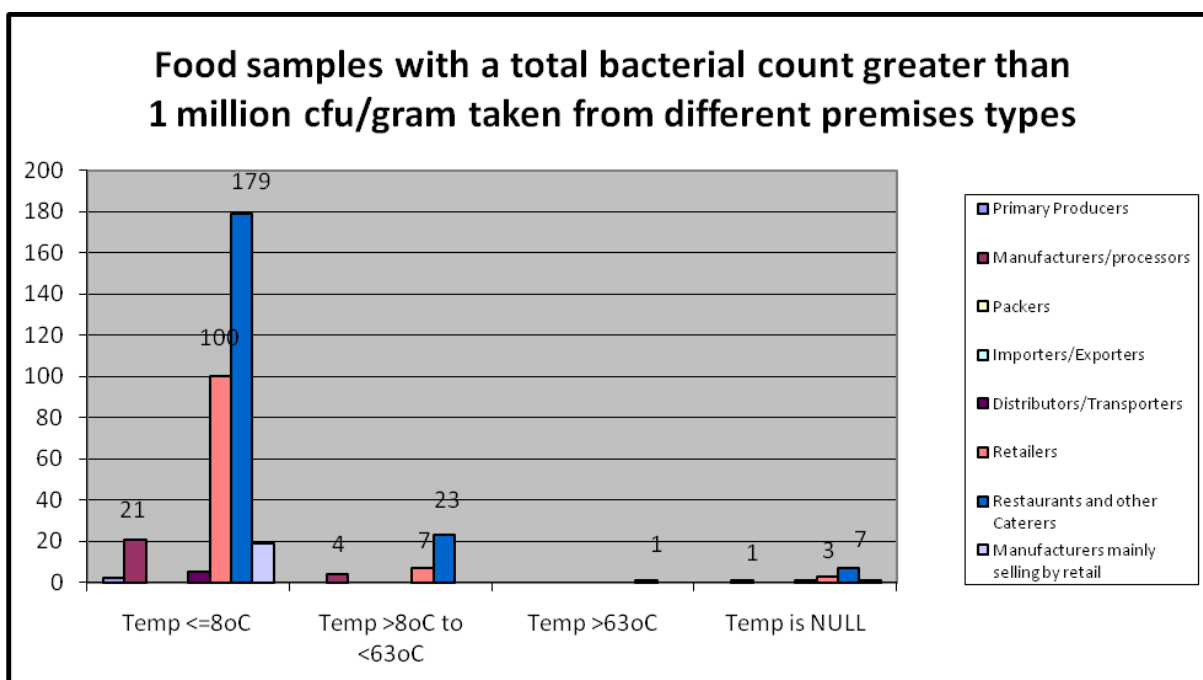
Examination of food by temperature profile

Figure 17 – Comparison of the number of samples with a TVC greater than 1 million cfu/gram by temperature profile



Examination of food by temperature profile and premises type

Figure 18 – Food samples with a total bacterial count greater than 1 million cfu/gram by premises types



Appendix 5

Additional evaluation of chemical sample data

Figure 1- Number of chemical sample analysis reported satisfactory and unsatisfactory by month (2008)

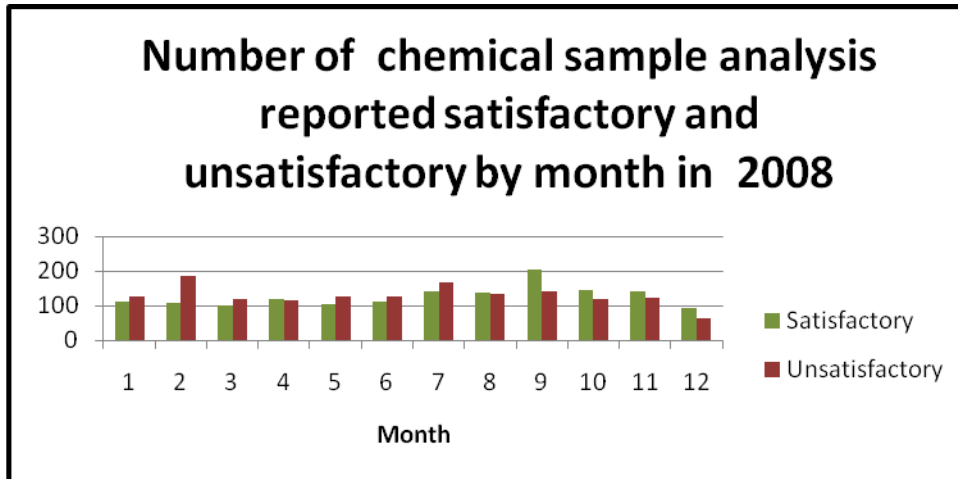


Table 1 - Totals/percentages of food samples reported as satisfactory/unsatisfactory

Food samples	Satisfactory	% Satisfactory	Unsatisfactory	% Unsatisfactory	Totals
Chemical analysis	1535	49.9%	1543	50.1%	3078
Microbiological examination	4413	70.8%	1823	29.2%	6236
Total	5948	63.9%	3366	36.1%	9314

Appendix 6

Chemical and Microbiological Food Surveys

In the United Kingdom a number of sampling programmes are initiated by organisations such as

- **Local Authority Co-ordinators of Regulatory Services (LACORS)**
- **Food Standards Agency (FSA)**
- **Health Protection Agency (HPA)**

Each year a number of authorities across the UK are invited to participate in surveys. The surveys are often reported separately by the sponsoring organisation and participating authorities are informed of the results. No attempt is made in this report to outline the outcomes of these surveys, some of which have not been fully completed.

In addition there are also opportunities for authorities in Northern Ireland to participate in local sampling initiatives co-ordinated by Northern Ireland Food Liaison Group (NIFLG)

CHEMICAL FOOD SURVEYS
January 2008-March 2009

SURVEY	LEAD BODY	START / END DATE	OTHER INFORMATION
Continuation and extension of the ongoing salt survey work with extension to fats and sugars trends in pre-packed food	LACORS / FSA	First sampling period from 1st June 2008 until 31st August 2008 Second sampling period from 1st December 2008 until February 28th 2009	Results to be submitted by 31st October 2008 Results to be submitted by March 31st 2009 Completed Report not issued
Basmati rice from restaurants & retail outlets	NIFLG	February 2008	Completed February 2008 Report issued
Labelling of pre-packed sandwiches.	NIFLG	February 2008	Completed February 2008 Report issued
Fish species (in catering sector)	FSA –ASSG	Oct 2007-Feb2008	Completed February 2008 Report issued
Nutritional value primary school meals	SGEHC	Feb-March 2008	Completed March 2008 Report issued
Kebabs	LACORS Food Standards Group	1 st April- 30 th June 2008	Completed June 2008 Report issued
Imported food: added water in chicken, etc.	FSA funded	June- Mid August 2008	Completed August 2008 Report issued
2 nd Follow up survey fat and sulphur dioxide in minced beef	NIFLG	Aug- Sept 2008	Completed Sept 2008 Report issued
Foreign species in minced beef	NIFLG	Aug- Sept 2008	Completed Sept 2008

			Report issued
Sodium in Sausages	NIFLG	Oct-Nov 2008	Completed Nov 2008 Report issued
Foreign species in pork sausages	NIFLG	Oct-Nov 2008	Completed Nov 2008 Report issued

MICROBIOLOGICAL SURVEYS JANUARY 2008 – MARCH 2009

SURVEY	LEAD BODY	START / END DATE	OTHER INFORMATION
RTE speciality meats	LACORS / HPA	1 st April 2008- 31 st March 2009	Completed March 2009 Report issued
Raw egg mix & env. samples from catering establishments	LACORS / HPA	1 st May-31 st October 2008	Completed October 2008 Report issued
Ready to eat shelled nuts from retail premises	LACORS / HPA	October 2008- March 2009	Completed March 2009 Report issued

Appendix 7 - Glossary of terms used in the report

Aerobic Colony Counts (ACC) or Total Viable Counts (TVC): are used to measure the general microbiological quality of ready to eat foods. PHLS guidelines set out various limits for the ACC for different foods depending on their type, the processing that the food has undergone, and the potential for microbial growth during storage. According to this criteria samples fall under one of five PHLS ACC categories.

ASSG: a sub group of LACORS Agency Sampling Co-ordination Group.

Bacillus cereus: is typically found in the environment, soil and dust. It is often associated with rice, spices and cereals. The organism protects itself from harsh environmental conditions by forming a spore that is heat resistant. The bacillus will grow rapidly in warm conditions if left for long periods at room temperature. Its presence in food can imply poor hygiene practices and inadequate cooking and reheating or temperature abuse of food. Consumption of food in which large numbers of *Bacillus* species have grown can cause gastrointestinal illness, either by the consumption of pre-formed toxin or by toxins produced by these bacteria in the gut.

Campylobacter: the commonest reported bacterial cause of infectious intestinal disease in the UK. Two species account for the majority of infections: *C.jejuni* and *C.coli* illness which is characterised by severe diarrhoea and abdominal pain. Undercooked meat (especially poultry) is often associated with illness, as is unpasteurised milk and untreated water. The majority of infections, however, remain unexplained by recognised risk factors for disease. The presence of *Campylobacter* in a 25 gram sample of ready to eat food is classified as unacceptable/potentially hazardous (PHLS Guidelines)

CEHOG: Chief Environmental Health Officers Group

cfu/gram: Colony forming units per gram of food

Chemical analysis: Relates to tests carried out on food samples to detect contamination, presence of additives and compliance with nutritional standards and labelling.

Clostridium perfringens: is a food poisoning organism widely distributed in the environment and foods, and forms part of the normal gut flora in man and animals.

Spores of *Clostridium perfringens* survive cooking and during slow cooling and unrefrigerated storage can germinate and form growing cells.

Ready to eat foods that contain *Clostridium perfringens* at levels of 100 to 10,000 colony forming units per gram (cfu/g) of food are classed as unsatisfactory and where levels are in excess of 10,000cfu/g the food is classified as unacceptable/potentially hazardous. (PHLS Guidelines)

Code of Practice: This relates to the procedures which authorised officers should follow when procuring and handling food samples taken under the Food Safety (NI) Order 1991 and the Food Safety (Sampling and Qualifications) Regulations (NI) 1991

Country of origin: The country which appears on the food label, if available.

Cross contamination: a term used to describe the transfer of bacteria from a source onto a high risk food such as cooked meat products. Sources of food poisoning bacteria are raw meats, and poultry, humans, insects, animals and birds, rodents, dust, refuse and waste food.

DARD (QAB): Department of Agriculture and Rural Development (Quality Assurance Branch)

EC Regulation No. 882/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules

EHO: Environmental Health Officer

Enforcement/Investigation: in relation to sampling activities means the gathering of chemical and microbiological information on food sampled in a food premises for the purposes of supporting enforcement action and in relation to an incident, allegation e.g. investigation of food poisoning or a contravention

Enterobacteriaceae: The group of bacteria known as *enterobacteriaceae* forms part of a much larger group of bacteria that can be found in the environment, including the intestines of man and animals. High numbers of these organisms usually indicate poor hygiene, cleaning and disinfection practice and inadequate cooking. Large numbers of *enterobacteriaceae* also suggest possible contamination of ready to eat foods after cooking.

Escherichia coli (E.coli): The group of bacteria known as *Escherichia coli* are faecal organisms found in the intestines of man and animals (*not to be confused with pathogenic E.coli 0157 VTEC*). The presence of *E. coli* in food can imply poor

personal hygiene. Failure by food handlers to wash their hands after using sanitary facilities and then handling ready to eat foods can result in food being found to contain this organism. Inadequate cooking of food can also be implicated.

E.Coli 0157: also known as VTEC (verocytotoxin producing *Escherichia coli*) is a type of bacteria of which 0157 is the most common in the UK. It can cause a range of symptoms, from mild diarrhoea to severe abdominal pain and bloody diarrhoea. In a small proportion of patients (2-7% and mainly children) it can cause haemolytic uraemic syndrome which is a serious condition that can lead to kidney failure. If this organism is detected in food at any level in 25 grams the food sample is considered unacceptable/ potentially hazardous (PHLS Guidelines)

Food Examiner: a person or persons appointed under the sampling and qualifications regulations by the District Councils to undertake the microbiological examination of food on their behalf.

Formal: in relation to food sampling means the acquisition of a food sample in accordance with official procedures such that the information from examination or analysis can be used in the course of any future legal proceedings.

FSS (UK): Food Surveillance System (United Kingdom)

HPA: Health Protection Agency

HPS: Health Protection Scotland

Informal: in relation to food sampling means the acquisition of a food sample not in accordance with official procedures. It is used in situations where officers wish to gather information about the microbiological state of food on sale or chemical composition of food. The information obtained from informal sampling can be used to identify future sampling initiatives or facilitate training/education of food handlers.

Interventions: are defined in the Food Law Code of Practice (Northern Ireland)- August 2008. Interventions are defined as activities that are designed to monitor, support and increase food law compliance within a food establishment. Activities included under this definition include monitoring, surveillance, verification, audit, inspection, sampling and analysis.

LACORS: Local authority Co-ordinators of Regulatory Standards

LIMS: a term used to describe Laboratory Information Management Systems

Listeria monocytogenes: is a potentially life threatening organism. Healthy adults are likely to experience only mild infection, causing flu like symptoms or rarely gastroenteritis. However, Listeria infection can occasionally lead to severe blood

poisoning (septicaemia) or meningitis. Pregnant women, the elderly and people with weakened immune systems are more susceptible to *Listeria*. The organism can grow at low temperatures including refrigeration temperatures below 5 centigrade. It is however easily killed by cooking food thoroughly and by pasteurisation.

For ready to eat foods, four food safety criteria have been defined (Regulation EC 2073/2005), establishing different limits according to the potential of the food to support growth of the organism. Two tests are routinely carried out by the Food Examiner; the *Listeria monocytogenes* enumeration test (conducted on retail samples collected during their shelf life) and the *Listeria monocytogenes* detection test conducted at the end of the manufacture and for products that have a long shelf life under refrigeration. In accordance with Regulation EC 2073/2005 there is a requirement that ready to eat foods capable of supporting the growth of *Listeria monocytogenes* should not contain this organism at levels exceeding 100 colony forming units per gram throughout the shelf life.

Manufacturing selling mainly by retail: This is a premises classification and generally refers to food businesses that manufacture and sell food from the same premises e.g. butchers and bakers.

Microbiological examination: Tests to establish the bacterial quality of food and to determine the presence or absence of harmful microorganisms capable of causing food poisoning.

National Control Plan: a document indicating how a Member State of the EU has put in place arrangements to ensure implementation of the provisions of EC Regulation 882/2004.

NIFAC: Northern Ireland Food Advisory Committee

NIFLG: Northern Ireland Food Liaison Group

NIPHL: Northern Ireland Public Health Laboratory

NULL: a term used in FSS (UK) to denote a field in the database where there has been an item of data that is not made available at the time of sampling.

Pennington Report: a report produced following the investigation of the *E.coli* 0157 Outbreak in Lanarkshire Scotland (web link)

PHA: Public Health Agency

PHLS Public Health Laboratory Service Guidance: means guidelines for the microbiological quality of some ready to eat foods sampled at the point of sale. Vol 3 No. 3 September 2000.

Public Analyst: a person or persons appointed under the sampling and qualifications regulations by the district councils to undertake the chemical analysis of food on their behalf.

QUID: refers to the term Quantitative Ingredient Declaration

RASFF: Rapid Alert System for Feed and Food

Regulation (EC) No. 2073: Commission Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs

RTE: a term used to denote foods that are “ready to eat” food without further treatment or processing

Safefood: a North/South body, responsible for the promotion of food safety on the island of Ireland. It was established in 1999 under the terms of the British-Irish Agreement Act 1999 and the North/South Co-operation (Implementation Bodies) Northern Ireland Order 1999.

Salmonella: bacteria cause food poisoning, typhoid fever and paratyphoid fever. More than 2500 different strains of Salmonella have been identified. Symptoms of Salmonella poisoning include watery diarrhoea, stomach cramps, and sometimes vomiting and fever. The symptoms can last between 4 to 7 days. Transmission occurs by eating contaminated food, mainly of animal origin, or by faecal contamination from an infected person or animal. Salmonella infections are commonly acquired through consumption of cross contaminated or under cooked food products. PHLS guidelines for ready to eat foods indicates that if this organism is detected in 25 grams of a ready to eat food the sample is classified as unacceptable/potentially hazardous. EC Regulation 2073 also specifies control limits for Salmonella in foods.

Samples “Not pre-packed”: This classification relates to foods sold unwrapped.

Samples “Not pre-packed but with a date code provided”: This classification relates to foods sold unwrapped however, information regarding self life has been provided

Samples “Pre-packed for direct sale”: This packaging classification relates to foods that have been wrapped at the point of sale by the retailer for the consumer.

Samples “Pre-packed for the ultimate consumer or catering establishment”.

This packaging classification relates to food samples that have been put into packaging before being offered for sale in such a way that – whether wholly or only

partly enclosed, cannot be altered without opening or changing the packaging and is ready for sale to the ultimate consumer or to a catering establishment, and includes a food which is wholly enclosed in packaging before being offered for sale and which is intended to be cooked without opening the packaging and which is ready for sale to the ultimate consumer or to a catering establishment. The classification does not include wrapped sweets or chocolates which are not enclosed in any further packaging and which are not intended for sale as individual items.

Sampling: the activity of authorised officers in collecting food samples for the purposes of food examination or analysis

Sampling Officer: a person appointed and authorised by the district council to collect samples of food for microbiological examination and chemical analysis.

Staphylococcus aureus (S.aureus): is a food poisoning organism and is found on the skin, nose and mouth of man. *Staphylococcus aureus* can cause disease, particularly if there is an opportunity for the bacteria to enter the body. The presence of numbers of this organism on food can indicate that the food has not been hygienically handled. It can indicate that food handlers have not been following sound hand washing procedures and good personal hygiene when handling ready to eat foods. *S.aureus* is capable of producing a heat stable toxin that can cause food poisoning.

Surveillance monitoring: in relation to sampling activities means the gathering of chemical and microbiological information on food sampled in a food premises for the purposes of determining the general state of safety of food exposed for sale as part of the Council's sampling plan or in consequence of a survey.

TVC: Total viable colony count. On some graphs through the text this is represented by the symbol 10^x meaning 10^x

Unrated: relates to a food premises that have no assigned hygiene or standards risk category/classification as defined in the Food Law Code of Practice (Northern Ireland).

Risk Classification

Hygiene risk rating system: For the purposes of the Food Law Code of Practice Environmental Health Officers use an intervention hygiene risk rating category system to determine the frequency of inspections. The risks rating category range from A (the highest risk) to E (the lowest risk) which dictate the frequency of intervention as set out below.

Risk Category	Minimum intervention frequency
A	6 months
B	12 months
C	18 months
D	24 months
E	Programme of alternative enforcement strategies every 3 years

The principle of risk classification is to ensure that premises deemed to present a higher risk to food safety are visited more frequently.

Food Standards risk classifications

Risk Category	Minimum Intervention Frequency
A (High)	At least every 12 months
B (Medium)	At least every 24 months
C (Low)	Alternative enforcement strategy or intervention every 5 years

For the purposes of the Food Law Code of Practice Environmental Health Officers use an intervention food standards risk rating category system to determine the

frequency of inspections. The risks rating category range from A (the highest risk) to C (the lowest risk) which dictate the frequency of intervention.

Microbiological quality standard for *Listeria* species (colony forming units/gram {cfu/g}) unless stated.

Listeria	Satisfactory	Acceptable	Unsatisfactory	Unacceptable (potentially hazardous)
Listeria species	< 20	20 to < 100	> 100	N/A
<i>Listeria-monocytogenes</i>	<20 *	20 to < 100	N/A	> 100

* Not detected in 25 grams for certain long shelf life products under refrigeration

Appendix 8 - Example of a leaflet of guidance issued to food business operators to help them interpret microbiological results.

Reporting results to you: You will be notified in writing of your results, usually in the following way:-

Satisfactory: means that the food sample was of good microbiological quality;

Acceptable: there were higher than expected levels of bacteria, the food was at a borderline limit of microbiological quality. The proprietor must review practices and procedures to ensure that safe food is produced;

Unsatisfactory: this indicates problems with food handling and/or storage. An urgent review of food handling procedures and practices is required to ensure that food does not cause food poisoning;

Unacceptable/potentially hazardous: consumption of this food may cause illness. Immediate action is required by the food business operator.

FOLLOW THESE SIMPLE RULES TO HELP YOU CONTROL THE SAFETY AND QUALITY OF YOUR FOOD:

- You must have a documented food safety management system in place that ensures appropriate controls are in place to manage food safety for all your food business activities. If you do not already have a documented system in place, contact this department where a suitable pack can be provided to you with assistance from your Environmental Health Officer.
- Adequately train all staff in food hygiene matters appropriate to their work activities.
- Wash hands thoroughly before handling food, and again between handling raw and cooked foods, and after going to the toilet.
- Clean all equipment, utensils and preparation surfaces thoroughly.

- Keep cooked and raw foods separated during preparation and storage.
- Wash salads thoroughly.
- Keep cooked and raw foods separated during preparation and storage.
- Wash salads thoroughly.
- Use food within its use-by date and promptly use foods you have already prepared.
- Keep foods covered.
- **Never** use raw eggs in food which is not going to be cooked e.g. mayonnaise, tiramisu
- Keep animals out of food preparation areas
- Use a temperature probe to monitor temperatures and disinfect the temperature probe each time it is used.
- Cook food thoroughly to reach at least centre temperature of 75°C and serve. If hot-holding keep above 63°C.
- Re-heat food to at least 75°C.
- Ensure any food requiring refrigeration is kept below 8°C and not left out for long periods.
- When preparing food in advance, ensure it is cooked thoroughly, cooled rapidly and stored in the fridge.
- Avoid using left-overs.
- Defrost food safely in the refrigerator (covered and below cooked foods).

Should you require any further information or advice please do not hesitate to contact this department on the telephone number below and ask to speak to an Environmental Health Officer within the Food Safety Unit.

Environmental Health Service
Belfast City Council
The Cecil Ward Building
4-10 Linenhall Street
Belfast BT2 8BP
Tel. 028 90270468
e-mail - environmentalhealthservice@belfastcity.gov.uk
Website: www.belfastcity.gov.uk



INTERPRETING MICROBIOLOGICAL RESULTS

Microbiological examination of food allows us to compare the levels of different bacteria found against those we expect to find in similar types of product. This helps us to assess whether the food was handled hygienically, stored correctly or would be a risk to health if consumed.

Food is tested for some, or all, of the following bacteria:

- Aerobic Colony Count (30 °C)
- Eschericia coli
- Enterobacteriaceae
- Staphylococcus aureus
- Clostridium perfringens
- Bacillus cereus and Bacillus species
- Listeria species
- Salmonella species
- Campylobacter species

Aerobic Colony Count (ACC) is the total bacteria found in food. This examination is usually carried out on most foods, the exception being those foods that would naturally contain high levels of harmless bacteria e.g. salamis and milk products. A high ACC may indicate the product has been kept too long or that it has been left unrefrigerated. Refrigeration of food slows down growth.

Eschericia coli (E. coli) is a bacterium which, is found in the gut of man and animals. It may be transmitted through faecal contamination at slaughter or through poor personal hygiene of food handlers. Their presence in cooked foods is indicative of poor personal hygiene – not washing hands after going to the toilet. There is a strain of E. coli (E 0157) which can cause serious illness. This bacteria is associated with meat e.g. burgers. The centre temperature of meats should reach at least 75°C or until the juices run clear. Always ensure cooked foods are separated from raw.

Enterobacteriaceae include bacteria that naturally inhabit the gut of man and animals but some are widespread in the environment. Enterobacteriaceae are useful indicators of hygiene and of post processing contamination of foods (i.e. from dirty machinery). Some of these bacteria are found in the environment and are therefore commonly found in salad/vegetable products or in cooked foods coming into contact with raw foods. It is essential therefore that salad are thoroughly washed, that all equipment be thoroughly cleaned and that cooked and raw foods are kept separate.

Staphylococcus aureus is a bacterium that can produce a toxin in food that can cause food poisoning. This bacterium is found in the nose and mouth of humans and in uncovered wounds, cuts, spots, boils etc. The presence of these bacteria in food is usually due to poor personal hygiene. It is essential that hands are washed before handling food.

Clostridium perfringens is a bacterium that is found in the gut of animals and humans and in the environment. Some strains can cause food poisoning. Cooking rapidly for sufficient time will reduce its presence. It is also essential to prevent cross contamination from raw to cooked foods, especially uncooked meats.

Bacillus cereus and Bacillus species are food poisoning bacteria. Bacillus is widely distributed in the environment, and therefore found on grains, beans, pulses etc. It is essential that foods are cooked thoroughly, and if not being served immediately they must be cooled rapidly and refrigerated. This bacterium is usually associated with rice dishes where large volumes of food are produced in advance and may be cooled slowly over several hours.

Listeria species especially Listeria monocytogenes are found in the environment and are usually associated with salads, pâtés and soft cheese. Its presence in cooked foods can be an indication of insufficient cooking or contact with raw foods. This bacterium can grow well at refrigeration temperatures. It is essential that foods are cooked thoroughly and covered, and that all equipment and surfaces are cleaned thoroughly.

Salmonella species are food poisoning bacteria which can be found in the intestines of animals, humans and in polluted waters. Salmonella may be present in food due to insufficient cooking of contaminated foods, or from cross contamination from raw food e.g. raw poultry to cooked foods, (which includes the use of raw eggs in uncooked dishes) or due to poor personal hygiene.

Campylobacter bacterium is known to cause food poisoning. This bacterium is found in the gut of some animals. Its presence in foods may be due to insufficient processing or cooking (e.g. unpasteurised milk, uncooked centre of rolled meat joints) or contamination by pets and other domestic animals. Food must be cooked thoroughly and once cooked not allowed to come into contact with raw foods or pets.