

Report of the Northern Ireland Strategic Committee on Food Surveillance concerning Food Sampling by District Councils in Northern Ireland in 2007



Foreword

As Chairman of the Northern Ireland Strategic Committee on Food Surveillance it gives me great pleasure to present the first 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 people and organisations to whom I am very grateful.

This report represents 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 the outcome of nearly 9,000 food samples which were obtained by environmental health officers during 2007 for microbiological and chemical analysis. These samples were taken for enforcement or surveillance/monitoring purposes. Based on this data there were no major issues regarding contamination of food with disease causing bacteria, nor where there any incidences where food was found to be potentially hazardous that would have required to be removed from the market. There were also no major food poisoning incidents reported in Northern Ireland in 2007.

While this report focuses only on local sampling it has the potential to allow local, regional and national comparisons. This information, which has not been previously readily available, will also facilitate environmental health officers in future 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 and no major issues were identified from last year's sampling programme. Nevertheless this report contains a number of recommendations to further improve food safety compliance. I would like to acknowledge the continued commitment and support of environmental health officers, Food Examiners and staff of the Public Analyst and the Northern Ireland Public Health Laboratory in obtaining and processing food samples and for recording the details on the Food Surveillance System. I would also thank and acknowledge the support provided by the secretariat of the Food Standards Agency for Northern Ireland and Health Protection Scotland who assisted with data analysis and technical support. Significant funding was provided by **safefood** to upgrade systems at the Northern Ireland Public Health Laboratory thus enabling the necessary links to the UKFSS database. Without the help and support of these many individuals and organisations this report would not have been possible.

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 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.



Dr. Brian Smyth

Director, Communicable Disease Surveillance Centre, Northern Ireland

September 2008

Northern Ireland Strategic Committee on Food Surveillance

- Dr. Brian Smyth – Director of Communicable Disease Surveillance Centre Northern Ireland
- Mr Mervyn Briggs – Senior Policy Officer – Food Standards Agency Northern Ireland
- Ms Esther Chartres – Higher Executive Policy Officer – Food Standards Agency Northern Ireland
- Mr John McKee – Principal Environmental Health Officer – Northern Ireland Food Liaison Group
- Dr. Paul Rooney – Consultant Microbiologist – Northern Ireland Public Health Laboratory
- Mr Ron Ennion – Public Analyst – Eurofins
- Mr Colin Magill – Senior Environmental Health Officer – North Down Borough Council
- Dr. Phillip Donaghy – Consultant in Communicable Disease Control – Eastern Health and Social Services Board
- Dr. Liz Mitchell – Deputy Chief Medical Officer – Department of Health and Social Services and Public Safety
- Dr. James McIntosh – **safefood**

Table of Contents

Executive summary	1
1 - Introduction	3
2 - The United Kingdom Food Surveillance System	4
3 - Sampling and analysis arrangements	5
4 - Sampling activity	7
5 - Microbiological sampling evaluation	8
5.1 - Numbers and levels of compliance	8
5.2 - Purpose for which samples were obtained	9
5.3 - Range of food types sampled	9
5.4 - Food types failing the required standard	11
5.5 - Relationship between premises risk classification and sample results	11
5.6 - Relationship between food premises type and sample failure	13
5.7 - Detection of pathogens in food	14
5.8 - Indicators of hygiene	18
5.9 - Microbiological quality of foods sampled.....	21
6 – Chemical food sampling evaluation	25
6.1 - Number of samples and levels of compliance	25
6.2 - Purpose for which samples were obtained.....	27
6.3 – Food types failing the required standard	27
6.4 – Relationship between risk classification and sample results	27
6.5 – Relationship between premises type and sample results.....	29
6.6 – Reasons for sample failure by product type	30
6.6.1 – Meat products and prepared dishes	30
6.6.2 – Bakery products and confections	31
6.6.3 – Drinks, soups, broths and sauces	31
6.6.4 – Specific food colour survey	32
7 - Conclusions	33
8 - Recommendations	34
9 – Reference documents for further information	35
List of Figures	
Figure 1 – Foods sampled for microbiological examination	10
Figure 2 – Comparison of the numbers of satisfactory and unsatisfactory food samples with premises hygiene risk category	12

Figure 3 – Distribution of satisfactory and unsatisfactory microbiology samples by premises type	13
Figure 4 – Summary of samples classified by hygiene indicator organisms identified	20
Figure 5 – Microbiological quality of meat products and prepared dishes	21
Figure 6 – Microbiological quality of dairy products and desserts	22
Figure 7 – Microbiological quality of bakery products, cakes and confectionery products	23
Figure 8 - Microbiological quality of soups, broths and sauces	24
Figure 9 - Microbiological quality of egg and fish products	24
Figure 10 - Microbiological quality of fruit and vegetable products.....	25
Figure 11 – Foods sampled for chemical analysis	26
Figure 12 – Number of samples compared with food standards risk category	28
Figure 13 – Distribution of satisfactory and unsatisfactory chemical samples by premises type.....	29
Figure 14 – Labelling and description failures for meat products and prepared dishes	31
Figure 15 – Labelling and description failures for bakery and confectionery goods	31
Figure 16 – Labelling and description failures for drinks, soups, broths and sauces	32

List of Tables

Table 1 – Totals/percentages of food samples submitted for chemical/microbiological testing.....	8
Table 2 – Totals/percentages of food samples reported as satisfactory/unsatisfactory	8
Table 3 – Totals/percentages of all food samples taken for Enforcement or Surveillance purposes	9
Table 4 – Top 5 food types sampled in Northern Ireland by reason for sampling ...	11
Table 5 – Top 5 foods found to fail microbiological standards.....	11
Table 6 – Distribution of satisfactory and unsatisfactory microbiology samples by premises type	14
Table 7 – Foods in which Listeria species were identified.....	16
Table 8 – Microbiological quality standard for Listeria species.....	16
Table 9 – Screening of foods for the detection of pathogens	17
Table 10 – Northern Ireland Public Health Laboratory (NIPHL) data January-December 2007 LIMS database	17
Table 11 – Number of indicator organisms found in food samples	20

Table 12 – Totals/percentages of food samples reported as satisfactory/unsatisfactory	25
Table 13 – Top 5 food types sampled in Northern Ireland by reason for sampling .	27
Table 14 – Top 5 food types failing composition/labelling	27
Table 15 – Distribution of satisfactory and unsatisfactory chemical samples by premises type.....	30
Table 16 – Excess colours identified in food	32

Executive Summary

This report represents the work of the Northern Ireland Strategic Committee on Food Surveillance, an expert group established in 2007, to independently evaluate statistical data obtained from the Food Standards Agency Food Surveillance System (United Kingdom) FSS(UK) database on sampling activities in Northern Ireland and produce an annual report. In particular the remit of the Committee was to:

- review chemical and microbiological food sampling activities and advise on sampling activities through examination and interpretation of food sample data (both chemical and microbiological)
- examine data for trends requiring further investigation and advise the Food Standards Agency Northern Ireland (FSANI) and district councils on potential future sampling projects.
- advise on sampling procedures and practices and the effectiveness of existing sampling strategies
- recommend to FSANI the nature and type of reports, their structure and format required to facilitate the evaluation of trends.
- invite expertise from other Agencies/Government Departments to share experience of good practice, and exchange data as appropriate and consider opportunities for co-operation and exchange of information on a North-South basis.
- evaluate any externally prepared reports making use of FSS(UK) data from the Northern Ireland database.
- publish an annual report of the sampling activities of district councils in Northern Ireland and, when available, compare sample data between the different administrations within the UK and present a summary of activities of the Committee to the Northern Ireland Food Advisory Committee
- invite expertise from outside the group to present information on sampling practice and experience in the UK and also invite representatives from FSS(UK) software providers to update the committee on developments in the software.
- review proposed sampling strategies directed through the Northern Ireland Food Liaison Group (NIFLG) and to make recommendations.

This first report relates only to data for the calendar year 2007 based on sample information made available to the Strategic Committee by Health Protection Scotland who manage the FSS (UK) on behalf of the Food Standards Agency and who undertook the statistical analysis of the Northern Ireland data. The tables and charts presented throughout the report have been derived from data obtained from the FSS (UK) database. The data represents those samples taken in 2007 for which there was a corresponding result available at 31 December 2007 and which has been entered onto the database.

In establishing this cut-off point the committee was aware that as a consequence a small percentage of samples taken in 2007 would be excluded from the report.

The food surveillance system used by the Environmental Health Officers (EHOs) in NI district councils was installed at the start of 2007. As the database was not operational in all council areas from 1 January 2007 the database system did not hold details on all food samples taken in the early part of the year for some localities. Nevertheless results on approximately 8,700 food samples were available for analysis and it is anticipated that there will be more complete datasets in future years.

It was accepted by the committee that there would be some gaps in data but it was the general opinion that it was important to look at the existing reliable sample details in 2007 for evidence of any trends.

Based on the available data the committee did not find any major issues regarding contamination of food with pathogenic (disease causing) bacteria, nor were there any incidences where food was found to be potentially hazardous that would have required to be removed from the market.

This report for 2007 focuses on the composition and microbiology of foods sampled by environmental health officers of district councils in Northern Ireland and offers

- Independent evaluation of the existing programmes of food sampling and
- Recommendations on the future direction of food sampling for district council sample plans.

1 - Introduction

In Northern Ireland food law enforcement is a function of the 26 district councils and is achieved through the work of environmental health officers, many of whom specialise in food control.

Coordination 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.

The food control activities undertaken by the environmental health officers 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 to assess compliance with food composition and labelling standards
- 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,
- Sampling of foods for compliance with composition and microbiological standards.

Much of the food control work is achieved through a balance of both enforcement and education of food business operators and food handlers. In this respect there are numerous examples of interventions undertaken by officers which are designed to raise awareness of food safety issues, including:

- Highlighting and promoting guidance notes prepared for the food industry e.g. sandwich manufacturer guidance
- Seminars and training delivered to food business operations on such topics as
 - Hazard Analysis Critical Control Point, “Safe Catering”, and “Safer Food Better Business”
 - Allergens awareness
 - Food labelling
 - Marketing terms
- Advice and support to food businesses including hygiene training and general hygiene information leaflets

This report, however, only focuses on the food sampling activities of the environmental health officers in Northern Ireland. Samples of both feed and food are also taken by officers from DARD Quality Assurance Branch (DARD (QAB)) but these samples are not currently on the FSS (UK) database. The report describes the current trends in sampling practice in Northern Ireland and offers recommendations on the potential future direction of sampling activities and identifies areas for specific project work or sampling initiatives.

2 - 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 FSS (UK) 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-year period. Health Protection Scotland 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.

3 – Sampling and analysis arrangements

In view of the fact that 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 considerations 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 and which were found to fail to meet feed and food safety requirements.

Environmental Health Officers who wish to obtain information on microbiological food contamination must submit their food 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 to examine food samples is based at the Northern Ireland Public Health Laboratory, which is an official control 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](#).

When food samples are examined by a Food Examiner the results are interpreted as one of the four grades of microbiological quality and these are detailed as follows:

- **‘Satisfactory’**. This is the term applied to foods which is of good microbiological quality and therefore the numbers of bacteria found are relatively low or not detected in the food.
- **‘Acceptable’**. This is the term applied to foods that reflect a borderline limit of microbiological quality and therefore the numbers of bacteria detected are higher than expected. A review of food handling procedures is usually necessary to ensure that safe food is produced.
- **‘Unsatisfactory’**. This is the term applied to foods with relatively high numbers of bacteria and indicates a problem with food hygiene and handling procedures. A review of working procedures must be conducted at the food premises where the sample was obtained and Environmental Health Officers may take additional food samples together with further inspection of the premises to determine the possible cause of the contamination.
- **‘Unacceptable / potentially hazardous’** test results indicate that immediate action is required to locate the source of the problem and consumption of such foods may cause illness. Such results may also form the basis for prosecution by the Environmental Health Officer.

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

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 on behalf of district councils.

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

4 – Sampling Activity

The Code of Practice issued under the Food Safety (NI) Order 1991 and Official Feed and Food Control Regulations (NI) 2006 indicates 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. Both the Food Standards Agency Code of Practice and the Framework Agreement of Local Authority Food Law Enforcement draw attention to the need for a local sampling policy and programme that also includes centrally co-ordinated sampling programmes.

No fixed sampling and testing frequency has been set down in the Community Legislation. The need for official sampling and testing should be assessed when the competent authorities are planning their sampling strategy in the context of their multi-annual national control plans according to Article 41 of EC Regulation No. 882/2004.

Historically, in Northern Ireland, central government, district councils and laboratories informally agreed that the sampling rate for district councils should be at a level of 2.5 samples /1000 population for chemical analysis whilst microbiological sampling was set at approximately 8 samples/1000 population. However, in recent years the microbiological sampling allocation levels have been reduced by the Northern Ireland Public Health Laboratory.

Prior to completion of the current Public Analyst contract in January 2006 the NIFLG recommended to the Chief Environmental Health Officers Group (CEHOG) that sampling rates should be between 1.5 and 2.5/1000 population dependant on risk.

For the period January to December 2007 across district council groupings in Northern Ireland the rate of sampling for chemical composition of food ranged between 1.2-2.5 samples/ 1000 population (median 1.4). For the same period the rate of microbiological sampling ranged between 2.9-3.7 samples/1000 population (median 3.6). The level may however be slightly

higher than these figures due to the fact that not all sample data was submitted to the central FSS (UK) database by a few authorities in the first few months of its operation.

5 - Microbiological sampling evaluation

5.1 - Numbers and levels of compliance

During 2007 Environmental Health Officers visited a range of food premises across Northern Ireland collecting samples and submitting them for examination to the appointed Food Examiner for microbiological examination. A total of 5878 samples as shown in Table 1 were reported from the UKFSS database. This represents 68% of all food samples collected by the officers.

Table 1 - Totals/percentages of food samples submitted for chemical/microbiological testing

Food samples	Total No. Samples	Percentages
Chemical analysis	2771	32.0%
Microbiological examination	5878	68.0%
Total	8649	100.0%

The classification of microbiological samples examined by the Food Examiner and Public Analyst was investigated and the following table prepared.

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

Food samples	Satisfactory	% Satisfactory	Unsatisfactory	% Unsatisfactory	Totals
Chemical analysis	1430	51.6%	1341	48.4%	2771
Microbiological examination	4095	69.7%	1783	30.3%	5878
Total	5525	63.9%	3124	36.1%	8649

Table 2 reveals the following information

- About 1/3 of food samples submitted for microbiological examination were reported to be unsatisfactory
- The level for unsatisfactory microbiological results was much lower than for food sampled for chemical composition analysis and labelling

Although the levels of samples reported as microbiologically unsatisfactory are reported at 30.33% it should be noted that detailed examination of the available sample data confirmed that much of the failure could be attributed to high bacteria counts rather than the presence of pathogens (see section 5.9).

5.2 - Purpose for which samples were obtained

Microbiological sample data was further examined to describe the purpose of sampling activity, i.e. either to support enforcement activities or as surveillance/monitoring. Table 3 gives a summary of the different activities.

Table 3 - Totals/Percentages of all food samples taken for Enforcement or Surveillance purposes.

Food samples	Satisfactory	Percentage	Unsatisfactory	Percent	Totals
Enforcement/ Investigation	1140	58.1%	822	41.9%	1962
Surveillance/ Monitoring	4385	65.6%	2302	34.4%	6687
Total	5525	63.9%	3124	36.1%	8649

Table 3 reveals the following information

- About 1/5 of all food samples were reported as having been taken for enforcement purposes. This figure may be inflated due to officer mis-interpretation of guidance when completing the sample submission forms in the first year of the use of the database.
- About 4/5 of all samples were taken for surveillance/monitoring purposes.
- There is a higher failure rate in relation to samples taken for enforcement/investigation purposes than for surveillance/monitoring activities. However, this comment is likely to be influenced by the different interpretations officers made regarding their purpose of sampling, e.g. enforcement or monitoring.

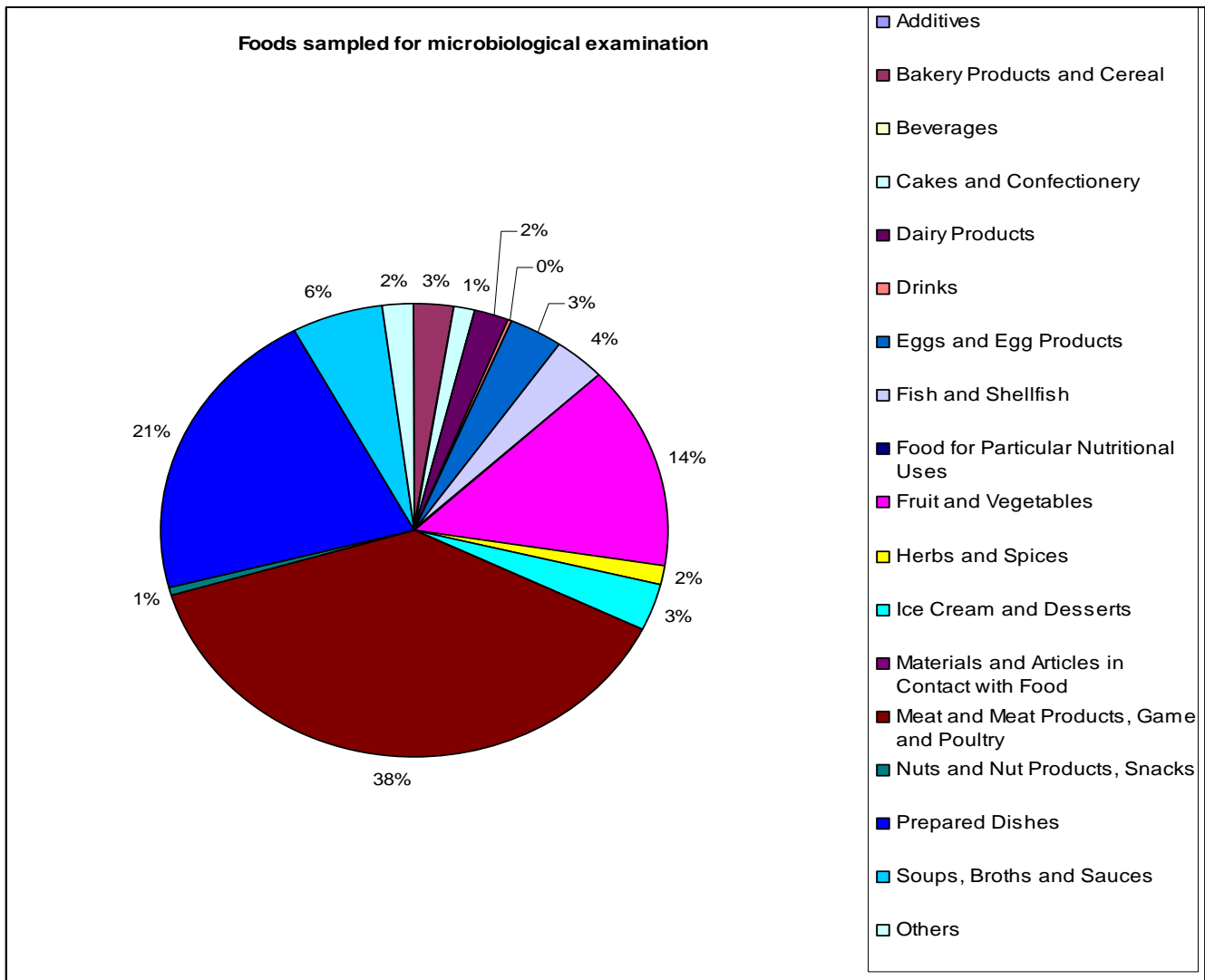
The table demonstrates that officers use sampling activities to help support legal investigation procedures and also to help establish trends in the microbiological content of food exposed for sale.

5.3 - Range of food types sampled

For official food control purposes foods are classified into over 20 categories which are further subdivided. The chart (figure 1) gives a diagrammatic representation of the scale of foods sampled under these categories.

Details of the numbers of samples of food taken under each of the categories are set out in Figure 1. Meat and meat products and prepared dishes are the most frequently sampled food for the purpose of microbiological examination irrespective of the reason the sampling activity. The fruit and vegetables category is also frequently examined. This class of foods includes foods items such as fresh, frozen and processed fruit and vegetables including salad pots and coleslaw.

Figure 1- Foods sampled for microbiological examination



The sampling activities in Northern Ireland for 2007 focused on the following foods under both enforcement and surveillance activities. Table 4 outlines the top five foods sampled.

Table 4 - The top 5 food types sampled in Northern Ireland 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 • Fish and shellfish 	<ul style="list-style-type: none"> • Meat and meat products • Prepared dishes • Fruit and vegetables • Soup, broths and sauces • Ice cream and desserts

These foods are common ready to eat foods capable of supporting the growth of harmful and spoilage bacteria if they have not been properly handled and prepared.

5.4 - Food types failing the required standard

Table 5 ranks the categories associated with failing microbiological standards. The major food types failing microbiological tests were meat and meat products and prepared dishes which represent the greatest proportion of foods sampled e.g. 59%.

Table 5 - The top 5 foods found to fail microbiological standards

Microbiological food Enforcement/Investigation	Microbiological food surveillance/monitoring
<ul style="list-style-type: none"> • Meat and meat products • Prepared dishes • Fruit and vegetables • Egg and egg products • Fish and shellfish 	<ul style="list-style-type: none"> • Meat and meat products • Prepared dishes • Fruit and vegetables • Egg and egg products • Fish and shellfish

These findings would support the continued sampling of these food products and consideration might be given by the enforcement authorities regarding suitable forms of intervention that would help food businesses achieve better microbiological standards.

5.5 - Relationship between premises risk classification and sample results

For the purposes of the Food Law Code of Practice Environmental Health Officers use an intervention risk rating category system to determine the interval that elapses between official control interventions in relation to standards of hygiene at each establishment. A report was

developed to examine the relationship between the premises sampled and their allocated risk category.

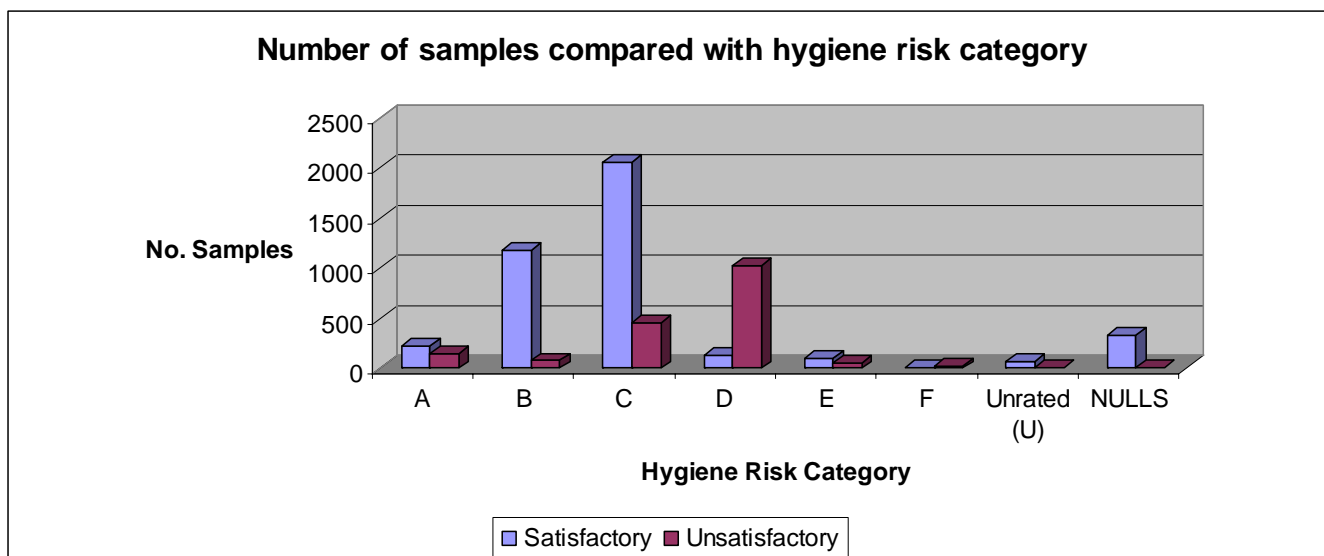
The risks rating category range from A (the highest risk) to E (the lowest risk) which dictate the frequency of intervention as set out below.

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.

Using data available from the FSS (UK) database the number of satisfactory and unsatisfactory microbiological samples were compared with the food premises risk classification category. The information is presented in graphical format in Figure 2.

Figure 2 - Comparison of the number of satisfactory and unsatisfactory food samples with premises hygiene risk category



The examination of data revealed the following:

- The majority of food premises fall within the hygiene risk categories of B, C and D and this appears to be where sampling is focused.
- 337 samples submitted did not have details of the risk classification of the premises sampled. Of these premises sampled 98% passed microbiological standards.
- 1155 samples (19.6% of all microbiological samples collected in 2007) were collected from the lower risk category D. Of these samples only 12% passed the microbiological standard.
- 64 samples came from premises that were unrated i.e. they had not been allocated a risk category. Of these samples 98% passed microbiological standards.

There are a number of “Null” results which indicate that the risk rating was not available at the time of sampling or the necessary sample submission form completed by the sampling officer did not contain this data. At present this information is not a mandatory field in the FSS (UK) software. Since the failure rate for samples is higher in the lower risk premises category it may be appropriate for the NIFLG to investigate whether this is an issue that requires specific interventions as D risk premises as they are only inspected once in every two years.

5.6 - Relationship between food premises type and sample failure

Food premises in Northern Ireland are classified into different types depending on the nature of their food operations and at the time of sampling this information is recorded. Comparisons were made between the type of premises sampled and the levels of compliance with microbiological tests as shown in Figure 3.

Figure 3 - Distribution of satisfactory and unsatisfactory microbiology samples by premises type

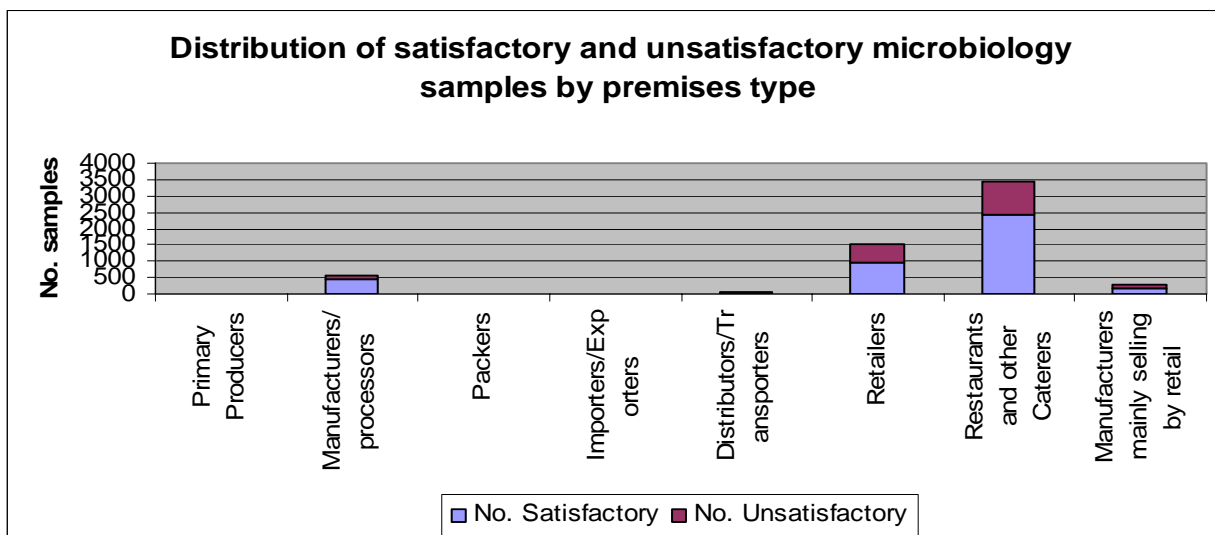


Table 6 - Distribution of satisfactory and unsatisfactory microbiology samples by premises type

Premises type	No. Satisfactory	No. Unsatisfactory
Primary Producers	1	8
Manufacturers/processors	452	139
Packers	3	1
Importers/Exporters	2	0
Distributors/Transporters	74	5
Retailers	985	524
Restaurants and other Caterers	2395	1020
Manufacturers mainly selling by retail	183	86
Total	4095	1783

The comparisons as set out in Figure 3 and Table 6 revealed that:

- Relatively few primary producers, packers and import/export premises are sampled for microbiological tests. There is potential for some survey work to establish the hygiene and safety of food originating from such sources.
- The majority of microbiological samples are taken from retail and catering premises.
- Although there are relatively few samples from primary producers they represent the greatest failure rate.
- Caterers represent the next highest failure rate followed by retail food premises sampled.

Table 6 confirms that in general, the bulk of samples are taken from restaurants and caterers which forms the larger category in terms of number of premises. The least number of samples are taken from importers or exporter premises, packers and distributors of food.

In terms of percentage failure of samples the manufacturers mainly selling by retail had a higher failure percentage (32%) compared with other manufacturers (23%). The difference is greater than that for retailers (34.7%) and restaurants and caterers (29.8%) and warrants further investigation. This finding may be a reflection of differences in the nature and extent of food safety management systems between larger and smaller manufacturers. This finding would support specific intervention activities with this specific group of food businesses to help them achieve better standards.

5.7 - Detection of pathogens in food

Food samples are examined to detect the following food poisoning pathogens

- *Salmonella*

- *Campylobacter*
- *E. Coli 0157*
- *Listeria*
- *Clostridium perfringens*

During 2007 no foods sampled were found to contain Salmonella or E-coli 0157. Only one food sample, which consisted of raw chicken fillets was found to contain *Campylobacter*. A further sample of raw chicken identified through the NIPHLS Laboratory Information Management System (LIMS) database but not reported in FSS (UK) was also shown to contain *Campylobacter* bacteria (This anomaly is thought to relate to a food sample the results of which were not available by 31st December 2007 and therefore excluded from the FSS(UK) data set).

The presence of *Campylobacter* is not an unexpected finding in a raw poultry product and such pathogenic bacteria would be destroyed by cooking.

The numbers of pathogens detected were extremely small compared with the total number of samples collected during the year. There were no detections of salmonella or *E Coli* 0157 in ready to eat food, raw food, processed food or swabs of food surfaces.

NIPHL advised that throughout the year a large number of samples were screened for seven different *Listeria* species, although this was not reflected in the data from the FSS (UK) database. Table 7 gives a breakdown of the distribution and type of foods found to contain *Listeria* species. This information was made available by NIPHL from their LIMS database. In total there were eighteen detections of *Listeria* species. Six of the eighteen samples were *Listeria* species other than *Listeria monocytogenes*. None of the samples were reported as potentially hazardous – See Table 9

Table 7 – Foods in which *Listeria* species were identified

Listeria monocytogenes	Other Listeria species
2 samples of ham 2 samples of cooked chicken 1 sample honey glazed ham	1 sample tuna pasta salad 1 sample cooked chicken
1 sample tuna, mayonnaise & sweetcorn 1 sample chicken tomato & chilli paste 1 sample Pasta tuna & Maria rose sauce 1 sample Crunch salad 2 samples of sandwich fillings	1 sample of cheese 1 sample sliced ham 1 sample special fish ball
1 sample goats cheese with garlic and sweet chilli sauce	1 sample cooked ox tongue

Public Health Laboratory Service (PHLS) – the forerunner of the Health Protection Agency - guidelines indicate how samples containing *Listeria* should be classified. Table 8 outlines the number of colony forming units per gram and the corresponding classification for *Listeria monocytogenes* and other *Listeria* species.

Table 8 - 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	> 10,000	N/A
Listeria-monocytogenes	<20 *	20 to < 100		> 100

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

The PHLS guidelines advise it is unacceptable that ready to eat foods contain any sero group of *Listeria monocytogenes* at levels at or above 100 colony forming units per gram of food.

In 2007, over 5000 food samples were examined for *Listeria* species and 18 of the food samples were positive, however, this information was not reflected in the FSS (UK) database due to a software conflict identified by the NIPHL LIMS administrator.

The Food Examiner advised that only three of these 18 samples registered on the FSS (UK) database were at satisfactory bacterial levels but none of the samples were reported as potentially hazardous i.e. greater than 100 cfu/gram.

As Table 9 demonstrates, a large number of samples are screened in Northern Ireland for presence of *Listeria* species using the enumeration method but foods that are likely to support growth of *Listeria* are also examined using a more sensitive test method of detection in 25 gram.

Table 9 - Screening of foods for the detection of pathogens

Total number of microbiological samples screened	Salmonella	Campylobacter	E Coli 0157	Listeria detection by enumeration	Listeria detection by presence in 25gm	Clostridium perfringens/gm
5878	0	1	0	6	0	10

In order to obtain a more complete picture of the foods screened NIPHL provided a supplementary Laboratory Information Management System (LIMS) report as detailed in Table 10.

The revised table differs from that of Table 9 in that it provides an idea of the total number of samples screened against each pathogen.

Table 10 - NIPHL Data January-December 2007 LIMS database

Total no. microbiological samples screened	Salmonella		Campylobacter		E.coli O157		Listeria sp. detection method by enumeration *		Listeria sp. detection by presence in 25 grams		Clostridium perfringens/gm	
	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg
	6149	0	5975	2	379	0	62	7	5104	18	328	15

* The enumeration detection method is less sensitive e.g. the detection limit is 20cfu/gm compared with detection in 25 grams.

The totals also differ in relation to *Campylobacter* and *Clostridium* because of the agreed cut off point for HPS to supply sample statistics from the FSS (UK) database i.e. 31 December 2007

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 is identified.

The Food Standards Agency launched a microbiological survey of cooked cold sliced cooked meats and pâtés on retail sale in the United Kingdom in March 2007. The main aim of the survey was to look for possible contamination of these products with *Listeria monocytogenes*. This was a random survey and sampling was based on market share to give a representative picture of the contamination levels throughout the United Kingdom. It was designed to allow for the collection and testing of 2,000 samples of cold cooked sliced meats and 2,000 pâté samples in England, Wales, Scotland and Northern Ireland (over the course of 6 months).

Where available, the country of origin / source and production types of all samples were recorded by sampling officers. The number of samples taken will allow a measure of the levels of *Listeria* present in cold cooked sliced meats and pâtés to be made. The final report should be published during autumn 2008.

The Food Standards Agency also launched a survey in August 2006 to gather information on the type and amount of *Listeria* species present in smoked fish on retail sale in the United Kingdom and the final report is imminent.

The detection of *Clostridium perfringens* in food in Northern Ireland was generally low with a total of 15 samples found to contain clostridia (5 of these samples were identified through the PHLS LIMS as documented earlier).

Clostridia were identified in the following food types:

- Fruit and vegetables
- Herbs and spices
- Meat and meat products
- Prepared dishes
- Soups, broths, sauces

Hazardous levels were not identified in any of the samples submitted for analysis.

5.8 - Indicators of hygiene

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 premises.

Figure 4 and Table 11 summarise the number of samples tested for hygiene indicators and the number of these failing acceptable standards by reason of indicator organisms.

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.

The group of bacteria known as *Escherichia coli* are faecal organisms found in the intestines of man and animals. 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.

Staphylococcus aureus is a food poisoning organism and is found on the skin, nose and mouth of man. 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.

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.

Figure 4 summarises the levels of indicator organisms found.

Figure 4 - Summary of samples classified by hygiene indicator organisms identified

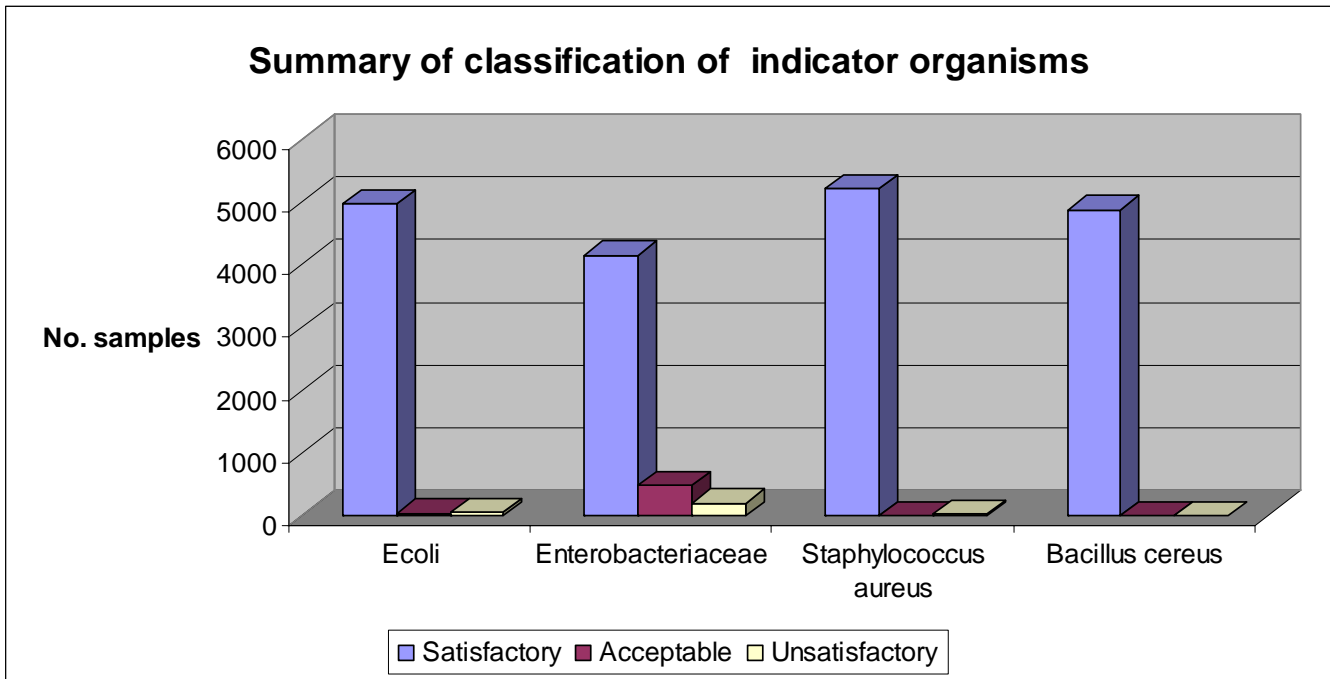


Table 11 - Number of indicator organisms found in food samples

	Satisfactory	Acceptable	Unsatisfactory
<i>E. coli</i>	4970	32	42
<i>Enterobacteriaceae</i>	4139	467	191
<i>Staphylococcus aureus</i>	5193	2	10
<i>Bacillus cereus</i>	4869	1	0

The number of samples failing microbiological hygiene indicator tests was highest for enterobacteriaceae. The tests that were reported as acceptable are, in essence, borderline but when added to the unsatisfactory results accounts for 16% of the tests on the main categories of foods that officers can sample.

Foods found to contain elevated levels of enterobacteriaceae were:

- Bakery products
- Cakes and confectionery
- Dairy products
- Egg and egg products
- Fish and shellfish
- Fruit and vegetables
- Herbs and spice
- Ice cream and desserts
- Meat and meat products and prepared dishes

The numbers of the other indicator organisms detected in food samples were by comparison relatively low.

5.9 - Microbial quality of foods sampled

In addition to conducting tests on food to establish levels of hygiene, tests are conducted to establish the total numbers of bacteria in a specified volume of food sampled.

Comparisons of total bacterial counts for the different food types were examined, and the following charts represent the ranked levels of bacteria loading for each food category. Grade “1” relates to the best and Grade “6” relates to the worst and would imply either poor hygiene or temperature abuse. Details of which Grades can be included in the classification “satisfactory” are detailed in the PHLS guidelines. The grades representing satisfactory microbiological quality for different types of ready to eat foods are detailed in Table 2 of the PHLS Guidelines e.g. for meat and meat products the satisfactory grade can range between “Grade 1 to 3 ” depending on whether or not it has been sliced. For ice cream products Grades “1 and 2 “ would be regarded as satisfactory.

The key to the levels in Figures 5 to 10 is as follows

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
$<10^3/\text{gram}$	10^3- $<10^4/\text{gram}$	10^4- $<10^5/\text{gram}$	10^5- $<10^6/\text{gram}$	10^6- $<10^7/\text{gram}$	$\geq 10^7/\text{gram}$

Meat and prepared dishes

Figure 5 - Microbiological quality of meat products and prepared dishes

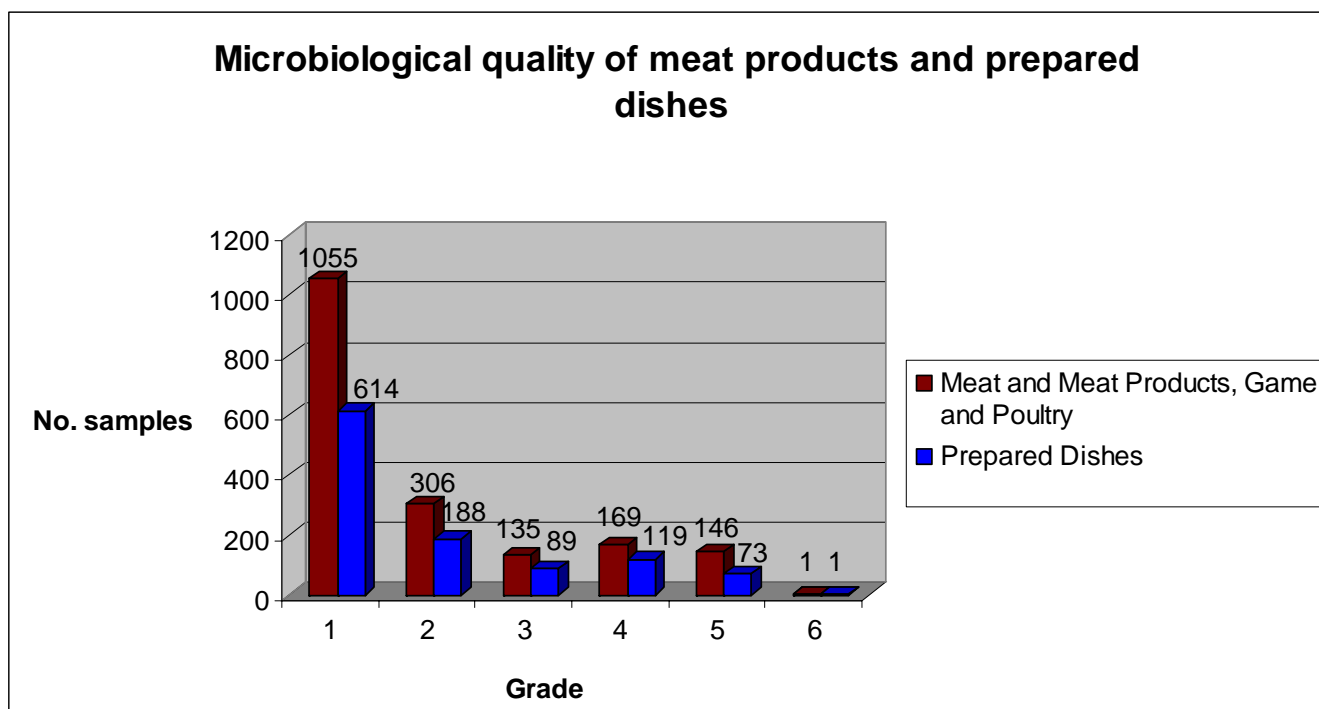


Figure 5 indicates that the microbiological quality of meat products and prepared dishes is generally good. There is however some evidence showing that these products are likely to have been subject to some temperature abuse with reported levels of bacteria at levels on occasions exceeding 1,000,000 per gram e.g. Grade 5 and 6.

The presence of bacteria at such levels could be as a result of a number of problems in the food premises from which the samples were obtained. Since the majority of samples are selected from catering and retail premises, the problems may lie with:

- Poor refrigeration of product on display or storage
- Poor handling practices or
- Inadequate cooking

Where the product is pre-packed the issue may revert back to the manufacturer cold chain within the processing establishments or the chill distribution chain.

The profile should be kept under observation and there would be merit in comparing sampling data for the UK regions to establish if this is a typical profile.

Future FSS (UK) reports for Northern Ireland will compare and contrast the microbiology of different foods either pre packed or sold loose.

Dairy products and desserts

Figure 6 - Microbiological quality of dairy products and desserts

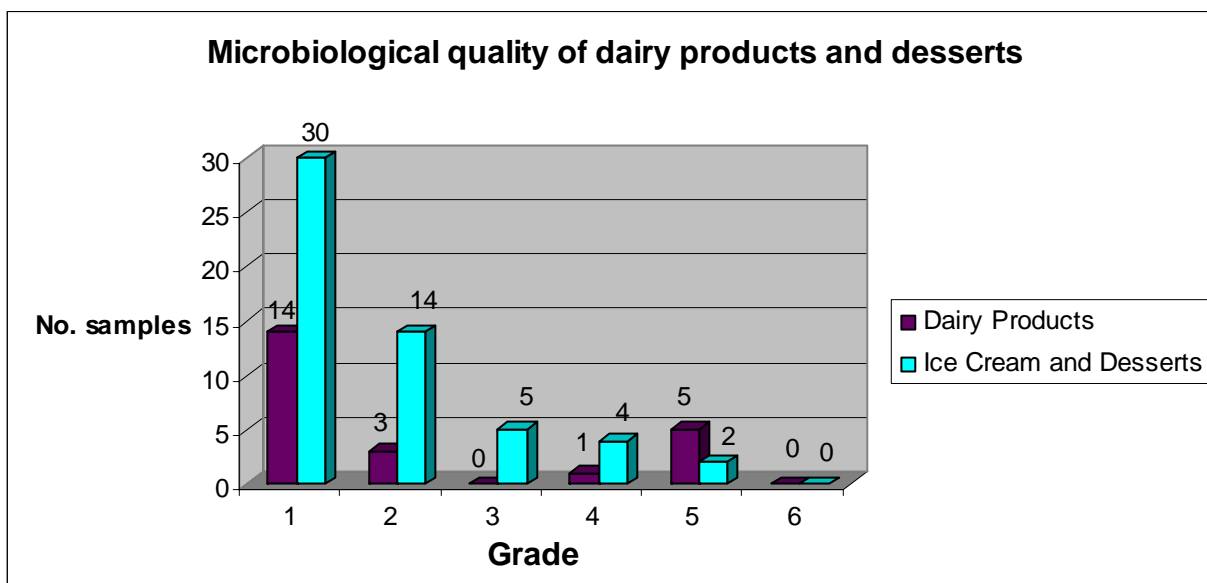
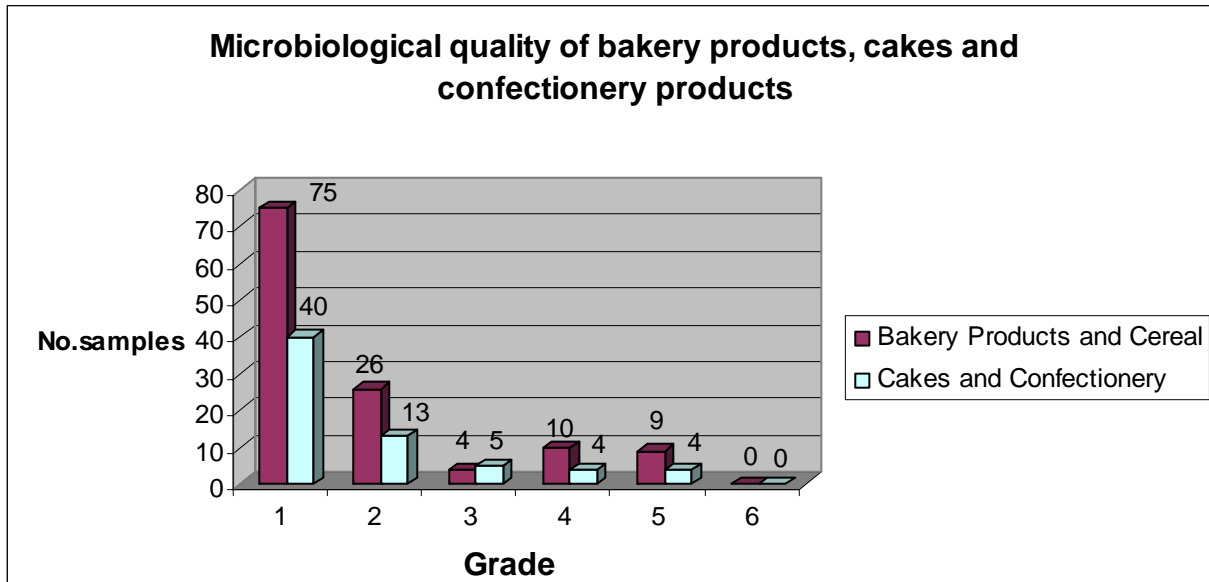


Figure 6 details dairy and dessert type products. Fewer dairy products were sampled compared with the meat and prepared dishes (e.g. 2%) but generally the microbiological

quality tended to be better. Ice cream and desserts accounted for 3% of the total samples submitted for microbiological examination. Higher microbial counts for ice cream were noted at levels greater than 1,000,000/ gram. It is worth noting that less than five samples fell into this category.

Bakery and Confectionery products

Figure 7 - Microbiological quality of bakery products, cakes and confectionery products

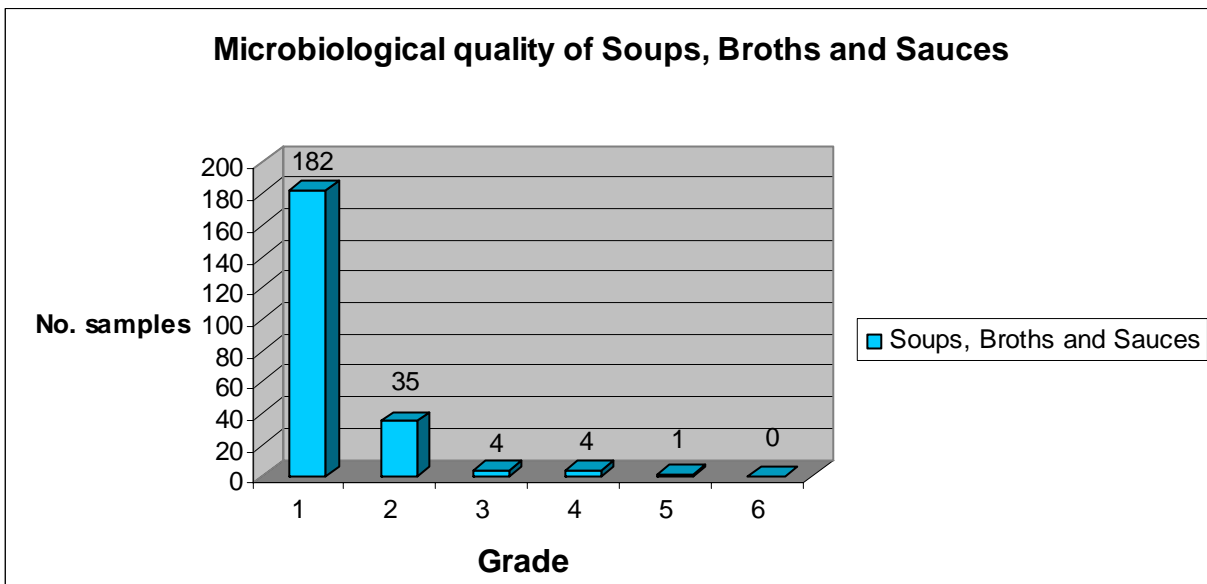


A significant number of bakery products as shown in Figure 7 were sampled as part of routine food surveillance monitoring. The number of samples with bacterial loading greater than 1,000,000/ gram was less than 10.

The need for microbiological examination of bakery ingredients that are to be baked at high temperatures in the context of a risk based sampling programme is questionable but it could be justified where the bakery goods contain materials that are highly perishable such as fresh cream. Rice products such as cooked rice which are capable of supporting the growth of food poisoning bacteria are also classified under the heading.

Soups, Broths and sauces

Figure 8 - Microbiological quality of soups, broths and sauces



It should be noted that 6% of all foods sampled in 2007 for microbiological examination were soup, broths and sauces. Figure 8 shows that the microbiological quality of these products was generally satisfactory with a significant number of samples being reported at Grade 1.

Egg and fish products

Figure 9 – Microbiological quality of egg and fish products

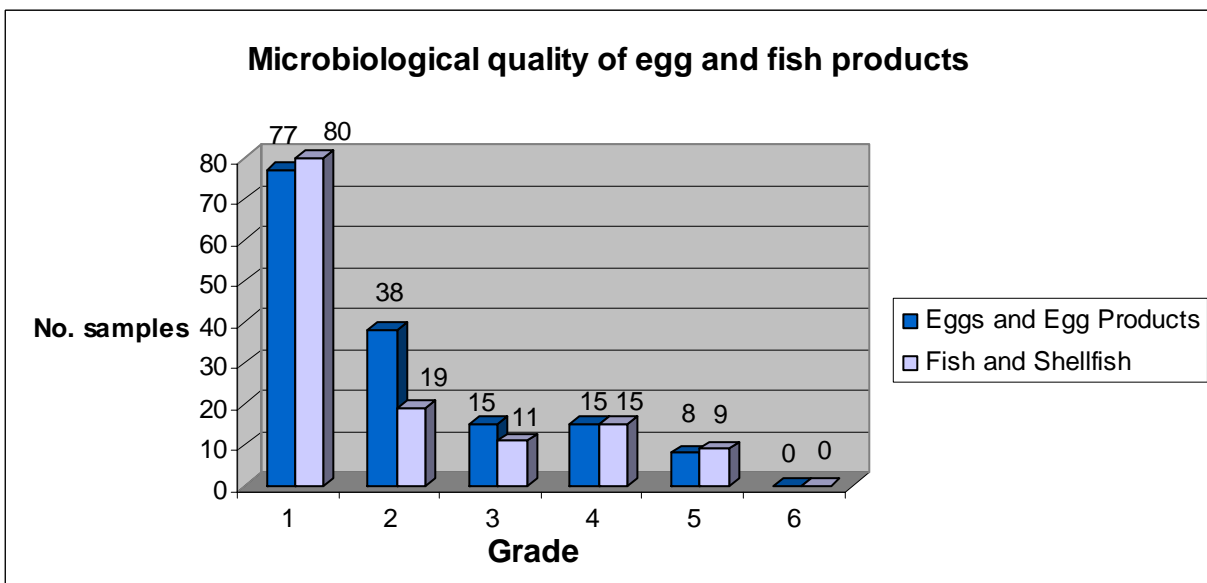


Figure 9 shows that both egg and fish products representing in total 7% of all foods submitted for microbiological examination were sampled by Environmental Health Officers.

Less than 10 samples were identified in the year with bacterial loadings above 1,000,000/gram.

Fruit and Vegetables

Figure 10 – Microbiological quality of fruit and vegetable products

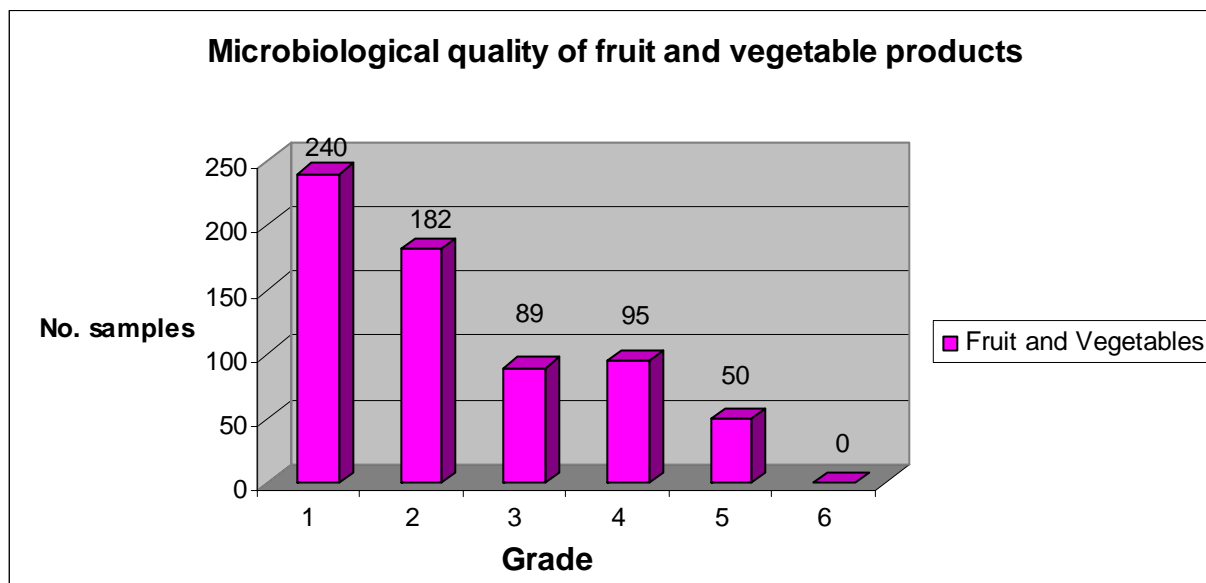


Figure 10 details the microbiological quality of fruit and vegetable products sampled by Environmental Health Officers. This category of food was the third most sampled food commodity. Samples falling under this category include the wide range of salad pots and coleslaw foods available on the market.

6 - Chemical Food Sampling Evaluation

6.1 - Numbers of samples and levels of compliance

During the year 2007 Environmental Health Officers visited a range of food premises across Northern Ireland collecting food samples and submitting them for analysis to the appointed Public Analyst as set out in Table 12. A total of 2771 samples were reported from the FSS (UK) database. Of the total samples collected 32% were selected for compositional analysis as set out in Table 1.

The level of compliance of compositional analysis of samples was investigated and the following table prepared.

Table 12 outlines the outcome of compositional analysis.

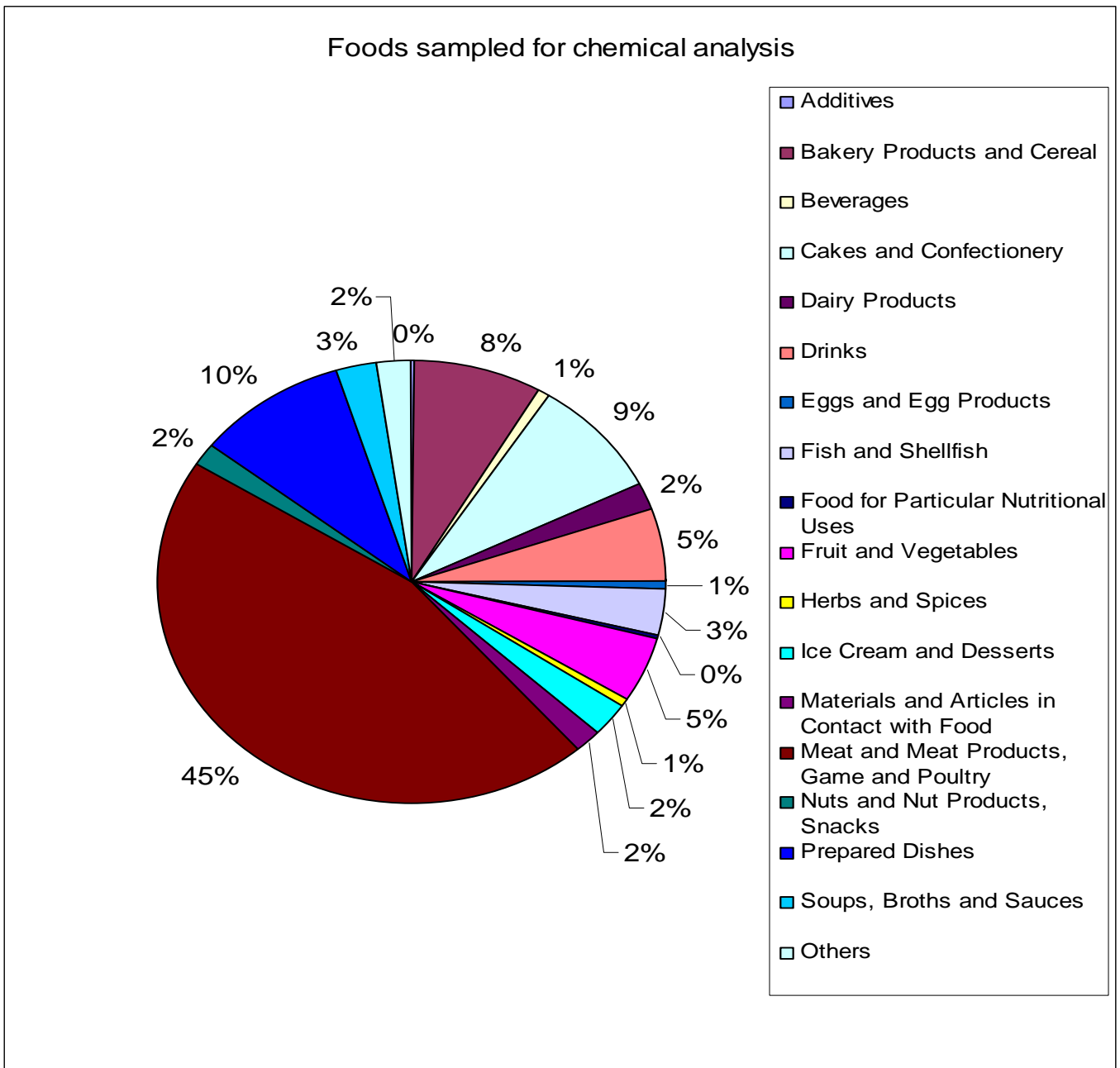
Table 12 - Totals/Percentages of food samples reported as satisfactory/unsatisfactory

Food samples	Satisfactory	% Satisfactory	Unsatisfactory	% Unsatisfactory	Totals
Chemical	1430	51.6%	1341	48.4%	2771
Microbiological	4095	69.7%	1783	30.3%	5878
Total	5525	63.9%	3124	36.1%	8649

Table 12 reveals the following information:

- Almost half of the food samples submitted for analysis were reported as unsatisfactory. This figure is partly due to the higher failure rate in compliance with labelling requirements. Food is analysed for compliance with compositional standards and labelling. Any type of labelling error is reported as a sample failure for the purposes of FSS (UK).

Figure 11- Foods sampled for chemical analysis



6.2 - Purpose for which samples were obtained

The foods sampled were also examined for relationships between the reason for sampling e.g. enforcement/investigation or surveillance /monitoring. Table 13 summarises the top 5 foods sampled under these headings.

Table 13 - The top 5 food types sampled in Northern Ireland by reason for sampling

Chemical enforcement/investigation	Chemical surveillance/monitoring
<ul style="list-style-type: none">• Meat and meat products• Prepared dishes• Cakes and confectionery• Bakery products and cereal• Drinks	<ul style="list-style-type: none">• Meat and meat products• Prepared dishes• Cakes and confectionery• Bakery products and cereal• Fruit and vegetables

6.3 - Food types failing the required standard

A further level of classification of sample data was used to examine differences between analytical compliance against the reason for sampling. Details of the sample information are set out in Table 14.

Table 14 - The top 5 foods failing in composition/labelling

Enforcement /Investigation	Surveillance/Monitoring
<ul style="list-style-type: none">• Meat and meat products• Prepared dishes• Egg and egg products• Soup, broth, and sauces/Bakery products & cereal• Fish & shellfish	<ul style="list-style-type: none">• Meat and meat products• Cakes and confectionery• Bakery products and cereal• Prepared dishes and• Ice cream & desserts

6.4 - Relationship between risk classification and sample results

As in the case of hygiene inspections, Environmental Health Officers also use a risk classification to categorise the premises they inspect in relation to food standards.

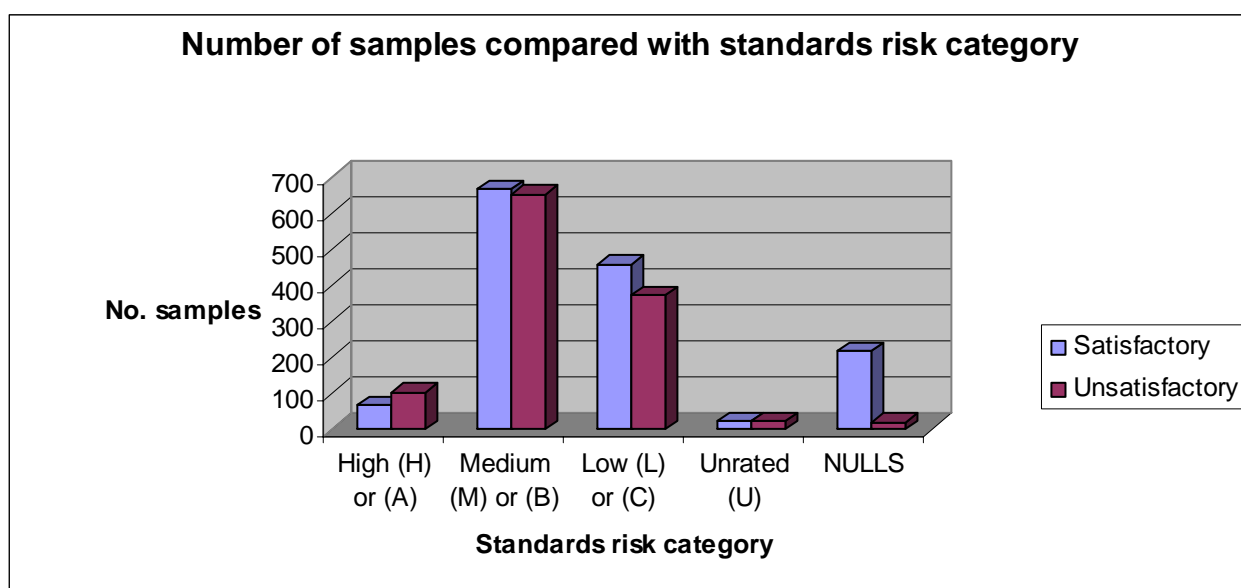
For the purpose of the Food Law Code of Practice, premises are risk category classified to determine the interval that elapses between official control interventions in relation to food standards at each establishment. Food Standards risk classifications are as follows:

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

A report was developed to examine the relationship between the premises sampled and their allocated risk classification.

Using data available from the FSS (UK) database the number of satisfactory and unsatisfactory analytical samples were compared with the food premises risk classification. The information is presented in graphical format in Figure 12.

Figure 12 - Number of samples compared with food standards risk category



The examination of data revealed the following:

- The majority of premises fall within the medium risk classification, i.e. (M) or (B) which are sampled most often.
- The worst level of compliance is in the (A) or (H) high risk classification. The compliance level was 39%.
- There were 237 samples with “Null” entries for the risk classification. 92% of these samples complied with compositional standards.

- 44 samples were taken from premises that were unrated. 50% complied with compositional standards.
- When the sample rate per premises was examined it verified that there was a focus on collecting more samples from the higher risk category premises.

6.5 - Relationship between premises type and sample results

The relationships between the type of premises being sampled and the analytical compliance were examined and details are summarised in Figure 13 and Table 15.

The chart reveals the following information regarding chemical analysis by food premises type:

- Few samples are taken from primary producers, packers, importers, exporters and materials and articles suppliers
- Manufacturers selling by retail are the most frequently sampled
- Retailers are the next most frequently sampled
- Excluding slaughterhouses, the premises type most likely to fail to achieve analytical compliance were retailers and manufacturers selling by retail

Figure 13 - Distribution of satisfactory and unsatisfactory chemical samples by premises type

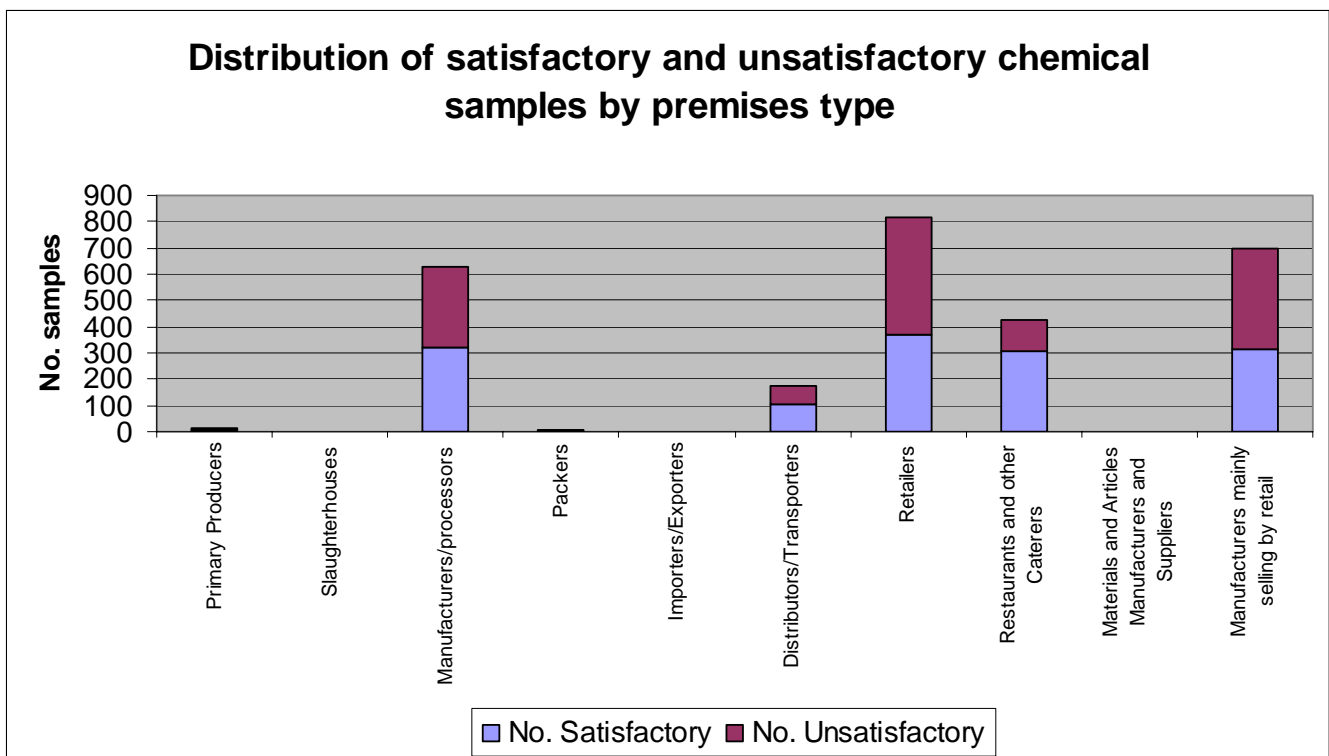


Table 15 - Distribution of satisfactory and unsatisfactory chemical samples by premises type

Premises types	No. Satisfactory	No. Unsatisfactory
Primary Producers	9	5
Slaughterhouses	0	2
Manufacturers/Processors	319	308
Packers	4	1
Importers/Exporters	1	0
Distributors/Transporters	108	68
Retailers	367	452
Restaurants and other Caterers	307	120
Materials and Articles Manufacturers and Suppliers	2	0
Manufacturers mainly selling by retail	313	385

Table 15 indicates that the majority of samples taken for analytical compliance were taken from retailers, restaurants and caterers, manufacturers, and manufacturers selling mainly by retail.

Premises identified with poorer analytical compliance were manufacturers selling mainly by retail (55%), retailers (55%) and manufacturer processors (49%).

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

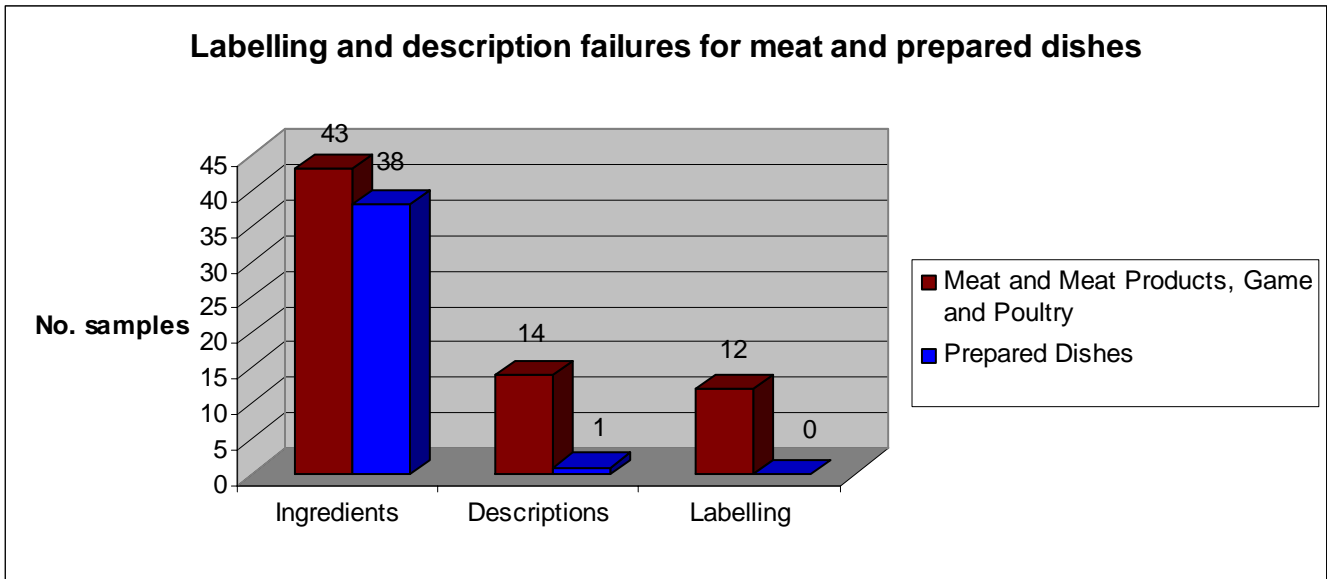
6.6 - Reasons for sample failure by product type

In view of the fact that there were significant samples failing composition and labelling requirements the committee examined data to establish reasons for the sample failures for the different food groups in respect of labelling.

6.6.1 - Meat products and prepared dishes

Figure 14 shows that for meat and prepared dishes the main failings related to ingredient listings and a small number also relating to misleading descriptions and general labelling.

Figure 14 - Labelling and description failures for meat products and prepared dishes



6.6.2 - Bakery products and confections

The food categories covering bakery goods and confections were also examined and the predominant reason for failed samples was through incorrect ingredient listings but with significantly fewer errors in description and labelling.

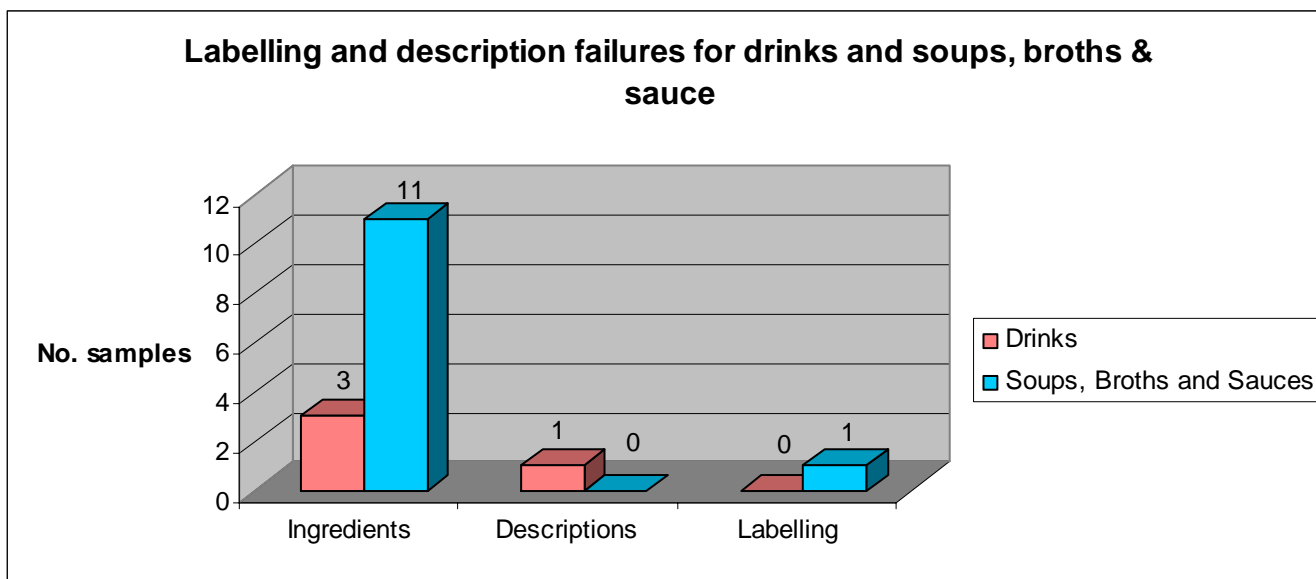
Figure 15 - Labelling and description failures for bakery products and cakes and confections goods



6.6.3 - Drinks, Soups, Broths and Sauces

There were much fewer samples in the drinks, soups, broth and sauce category but the trend as in the other two charts was that there were issues concerning correct ingredient listing.

Figure 16 - Labelling and description failures for drinks and soups, broths and sauces



Given the levels in failures on general labelling and description there may be merit in NIFLG considering an intervention that assists the smaller manufacturers in complying with legislative labelling and composition requirements. This is particularly important in the context of known allergens such as nuts.

6.6.4 - Specific food colour survey

During the year EHOs were targeting food samples for specific analysis for colour especially in some of the fast food premises where colours are used widely. Table 16 summarises the foods sampled. The work identified nine samples where the levels were unsatisfactory however, there were no samples reported to contain non permitted colours.

Table 16 - Excess colours identified in food

Food Category	Satisfactory	Unsatisfactory
Additives	1	0
Cakes and confectionery	12	1
Drinks	1	0
Herbs and Spices	7	0
Meat and meat products, game and poultry	19	0
Nuts and nut products, snacks	0	0
Prepared dishes	38	8
Soups, broth, sauces	4	0
Other	2	0

7 – Conclusions

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

The number of foods and ingredients sampled are considerable 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 and as such their occurrence in food is being monitored. As the volume of data on the different bacteria detected in food becomes more readily available it will be possible to look more closely at United Kingdom data to identify trends for which appropriate action can be taken

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 2007.

The results of food examination do however indicate that there may be scope in some cases for requiring improvement in relation to the hygienic handling and storage of food.

The Committee was aware of Environmental Health Officers working with NIFLG in local, regional and national surveys to help highlight trends in food microbiology and chemical composition. Such work has and will continue to inform enforcement authorities and FSANI on the state of food offered for or prepared for human consumption.

It is also apparent from this analysis that certain groups of food manufacturers and manufacturers selling by retail are making errors in the labelling of foods, particularly ingredients.

Further consideration should be given to ways in which food business operators can be supported in understanding the necessary details of the labelling rules.

The Committee would encourage NIFLG and officers in district councils to make full use of the FSS (UK) database and to continue with existing coordinating relationships and use this report to support and inform further sampling initiatives and interventions.

As this is the first report to use data obtained from the FSS (UK) the focus has been to provide a broad overview of the outcome of microbiological and chemical analysis of food samples. This has enabled, for the first time, a comprehensive insight into food sampling activities within Northern Ireland. It is anticipated that Northern Ireland data provided to the FSS (UK) in future years will enable more focused reports to be produced which can study trends in certain food groups or premises.

8 – Recommendations

The Committee would make the following recommendations based on the information contained in this report.

1. District councils when undertaking chemical food sampling programmes should continue to sample foods based on risk and sampling objectives (see section 3) and ensure that the sample target rate of between 1.5 to 2.5 samples / 1000 population is achieved and maintained where appropriate.
2. District councils should be encouraged to maintain and develop the existing levels of sampling of food for microbiological examination based on risk and sampling objectives (see section 3)
3. The Expert Group should meet with Northern Ireland Food Liaison Group to explore criteria to establish the future minimum sampling target rates based on risk.
4. Premises presenting the greatest risk to food safety/standards should be prioritised for the purposes of sampling for chemical and microbiological food analysis.
5. NIFLG should investigate why D risk classified premises have a higher rate of sample failure than the higher risk premises.
6. Officers should be given clear guidelines and training on the completion of sample submission forms and data submission to the FSS (UK). All fields on the sample submission screens in the database should be regarded as mandatory in terms of the information required.

7. NIFLG should investigate why significant numbers of samples are failing to comply with the chemical food sampling plan.
8. NIFLG should consider programmes of sampling to evaluate the effectiveness of refrigerated food storage facilities utilising interventions and sampling as appropriate.
9. Officers should continue to reinforce hygiene messages to food business operators during their food hygiene inspections and in particular reinforce the need for adequate hand washing.
10. Officers should continue to use the FSS (UK) database to process sample information and thus contribute to a greater database from which a range of trends can be identified and create greater intelligence for future sampling initiatives.
11. NIFLG should consider importers/exporters, packers and distributors when devising their food sampling programme.
12. UK wide FSS (UK) reports should be designed to identify trends in the occurrence of *Listeria monocytogenes* in food and food premises type.

9 - 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.