



Research Portfolio 2006–2015

Augmenting the protection of public
health on the island of Ireland

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Introduction

safefood is an all-island implementation body set up under the British-Irish Agreement with a general remit to promote awareness and knowledge of food safety and nutrition issues on the island of Ireland.

Our activities include:

- promotion of food safety
- research into food safety
- communication of nutritional advice
- surveillance of foodborne disease
- promotion of scientific co-operation and laboratory linkages
- development of cost-effective facilities for specialised laboratory testing
- scientific assessment of the safety and hygiene of the food supply.

Welcome to the **safefood** Research portfolio – a bank of information on the research projects that **safefood** has commissioned since 2006 across key subject areas. As such, it is a continuation of the initial **safefood** publication ‘Research Portfolio 2000-2005’.

All **safefood** commissioned research from 2000 onwards with Links to the various outputs from each project, including peer reviewed publications, are available on the new online research database at www.safefood.eu.



Context of *safefood*'s research programme

safefood's primary function is to 'bring about general acceptance that responsibility for the provision of safe food is shared among producers, processors, distributors at all levels, caterers and the general public'.

To this effect **safefood** considers the entire food chain in its outlook on research and ensures that our research programme is linked to, and supports, our primary function. Promotion of food safety, nutrition and healthy eating is targeted at the whole food chain and as a consequence so is our research.

Food safety

The issue of food safety is of central importance to consumers on the Island of Ireland both in terms of their own safety and well-being, and the strength of the agri-food economy.

Foodborne illness has a significant public health and economic impact on the island of Ireland and a significant proportion of acute gastroenteritis cases every year are suspected of being caused by the consumption of contaminated food or water. **safefood** employs research to address knowledge gaps and generate robust, credible and practical scientific advice to encourage good food safety practices amongst consumers and elsewhere along the food chain. Taking full advantage of its unique north/south position, **safefood** promotes scientific cooperation and linkages with laboratories and other stakeholders to strengthen the integrity of the food chain through initiatives including the **safefood** Knowledge Networks.

safefood realises the challenges faced by the agri-food industry in keeping adverse food safety events to a minimum. This is no easy task: the increasing complexity of the food supply chain and the unknown consequences of climate change and other influences make the task of hazard prediction difficult. Yet there is a clear need to develop greater capacity for identifying and arresting emerging food safety risks in an environment characterised by significantly evolving lifestyle changes. Consumers want food to be free from artificial chemicals, minimally processed, microbiologically safe, but also convenient, cheap and with an extended shelf life. So the challenge is to meet these demands while continuing to ensure high standards of consumer safety.

Nutrition and Healthy Eating

The link between diet and health is well documented and nutrition and healthy eating has been highlighted as a key public health issue.

Nutrition related issues, and in particular overweight and obesity, are among the key public health threats facing all developed countries. This is a considerable challenge facing society across the island of Ireland and a multi-sectoral, interdisciplinary approach is required. Given **safefood**'s all-island remit, it is uniquely placed to make a valuable contribution in tackling overweight and obesity and other nutrition-related issues (including diet-related health inequalities) on an all-island basis. This is achieved through the promotion of activities based on a robust evidence base.

safefood has developed key partnerships and collaborations with nutrition stakeholders on the island of Ireland and will continue to adopt a complementary and collaborative approach in the area.

Scope of *safefood*'s research programme

safefood undertakes a wide ranging programme of research and knowledge-gathering in order to address gaps in scientific knowledge related to food safety, food hygiene, nutrition and healthy eating. This research is used to build the evidence base for developing communications that are supported by science that is clear, authoritative, relevant and independent, including **safefood**'s consumer focused awareness campaigns. Such scientific work also enhances our understanding of the potential hazards in the production of food, and the measures needed to minimise or eliminate these hazards.

In order to address gaps in scientific knowledge related to food safety, nutrition and public health and to facilitate timely decision-making on emerging issues, safefood aims to undertake appropriate research and knowledge gathering by:

1. Identifying priorities for research
2. Commissioning and funding research projects as necessary to fill identified gaps
3. Establishing and maintaining a database of research programmes and monitoring progress
4. Disseminating research findings to relevant interests
5. Recommending action arising from research findings
6. Maintaining links with international bodies

Working with key stakeholders in research and other institutions, **safefood** has fostered all-island working relationships and enhanced partnership between research institutions across the island of Ireland. In addition, considerable emphasis has been placed on East-West co-operation with Great Britain, as well as the wider international research community. The aim is to increase multidisciplinary interactions within similar fields and also to encourage the flow of knowledge to augment the value of food safety research on the Island of Ireland.

In furtherance of this aim, **safefood** has established a suite of Knowledge Networks on the most important food safety and nutrition thematic areas. These are organised on an all-island basis and support scientific cooperation and knowledge transfer amongst experienced professionals. Together with **safefood**'s expert advisory structures such as their Advisory Committee, the Knowledge Networks provide a mechanism for augmenting in-house knowledge and expertise. The Knowledge Networks also enable **safefood** to maintain a watching brief on developments in relation to food safety issues internationally. This ensures a more tailor-made approach to the commissioning of research of specific relevance to the Island of Ireland while at the same time guarding against unnecessary duplication of effort.

The interpretation and sector-specific dissemination of research project outputs is the responsibility of the in-house specialists working in close collaboration with the contractual researchers. **safefood** has utilised the outputs from its research programme to carry out a series of public information campaigns designed to promote essential food safety practices and healthy eating behaviours. This includes tailoring the information to reach certain vulnerable groups within society including those with particular communication needs. Our Consumer focussed reviews on specific elements of the food chain including beef, dairy, chicken and pork inform our understanding of issues of consumer concern and any potential impacts on public health. This is augmented by surveys of practices in the retail and catering sectors that help inform communications in both the food safety and healthy eating sectors. Research into consumer behaviour also assists with understanding the decision making process around food choice, portion sizes and the impact of food advertising.

Thus, research outputs underscore the credibility of **safefood** advice which is essential to foster behavioural change. In this regard, the organisation has established itself as a key player in augmenting the protection of human health and the resilience of the agri-food chain on the island of Ireland.

The research subject areas

Since 2006, **safefood** has commissioned almost forty further research projects. Most involved laboratory or field investigations while a number of projects were/are desk-based.

In addition, **safefood** has carried out nine broad reviews of various aspects of the food chain. These projects can be broadly categorised into four thematic areas:

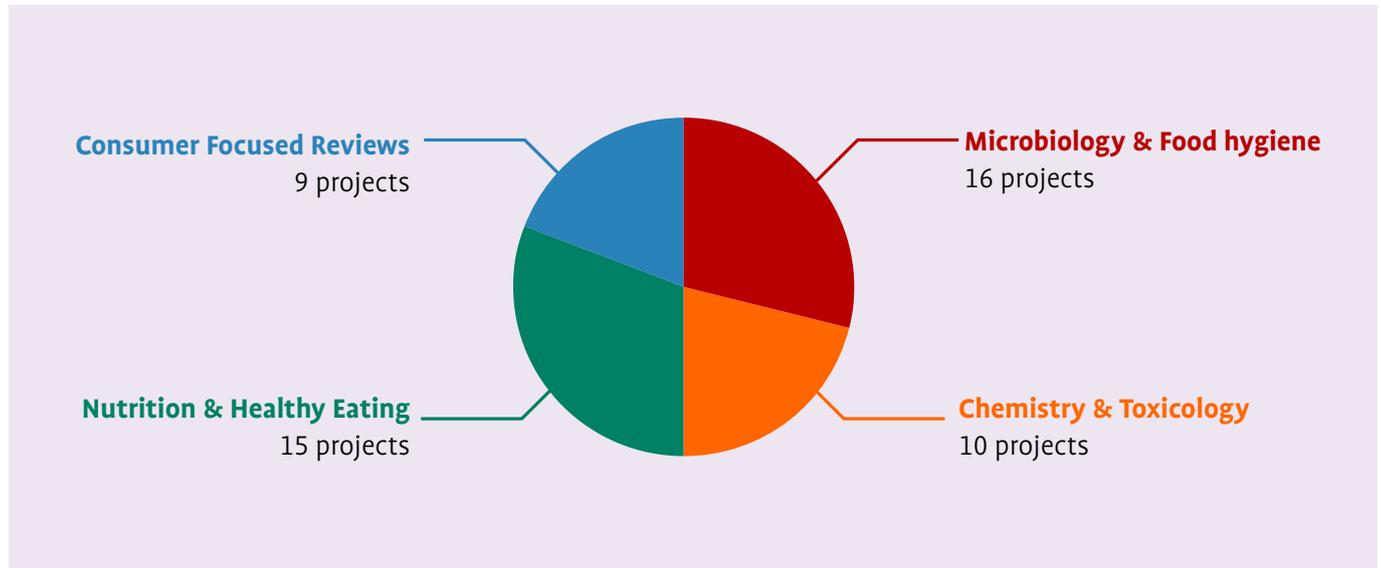


Figure 1: Number of **safefood** research projects by subject (2006–2014)

For logistical reasons, the information provided on each project is limited. This includes the principal contractor and any collaborating researchers and their employment institutions, when the project began and how long the research lasted, and the project's current status.

Outputs such as published reports or web-based or other resources emanating from a project are available on the **safefood** website, www.safefood.eu. A brief abstract describing the project objectives is provided. The portfolio includes information on research projects that are underway at the time of printing and, as such, it is a dynamic document that will be continuously updated.



Research procurement at safefood

The Research Office in **safefood** is responsible for the routine management of commissioned research projects including all aspects of the tendering and commissioning process.



Research priorities are identified and commissioned through a public competition that is advertised in the national media in both jurisdictions, online government procurement sites and also on the **safefood** website. A competitive funding programme with vigorous evaluation methods ensures that research funding is effectively targeted and equitably assessed. Each research proposal is externally evaluated under a number of criteria to ensure that it meets **safefood's** needs as iterated in the associated tender specification. Research management is underpinned by a robust package of corporate governance tools for continuous assessment of projects against governance, financial and scientific criteria. The goal is to achieve optimum use of resources that guarantees good value for money for the taxpayer on the Island of Ireland.

safefood ensures that the scientific research it commissions is of the highest quality and is relevant to both public health and the agri-food industry across the Island of Ireland. The research is not restricted to a particular format but covers the whole range from long-term fundamental research to short surveys that have rapid outputs. **safefood** particularly favours outputs that have high potential for application along the farm-to-fork continuum and that lead to positive and sustainable outcomes.

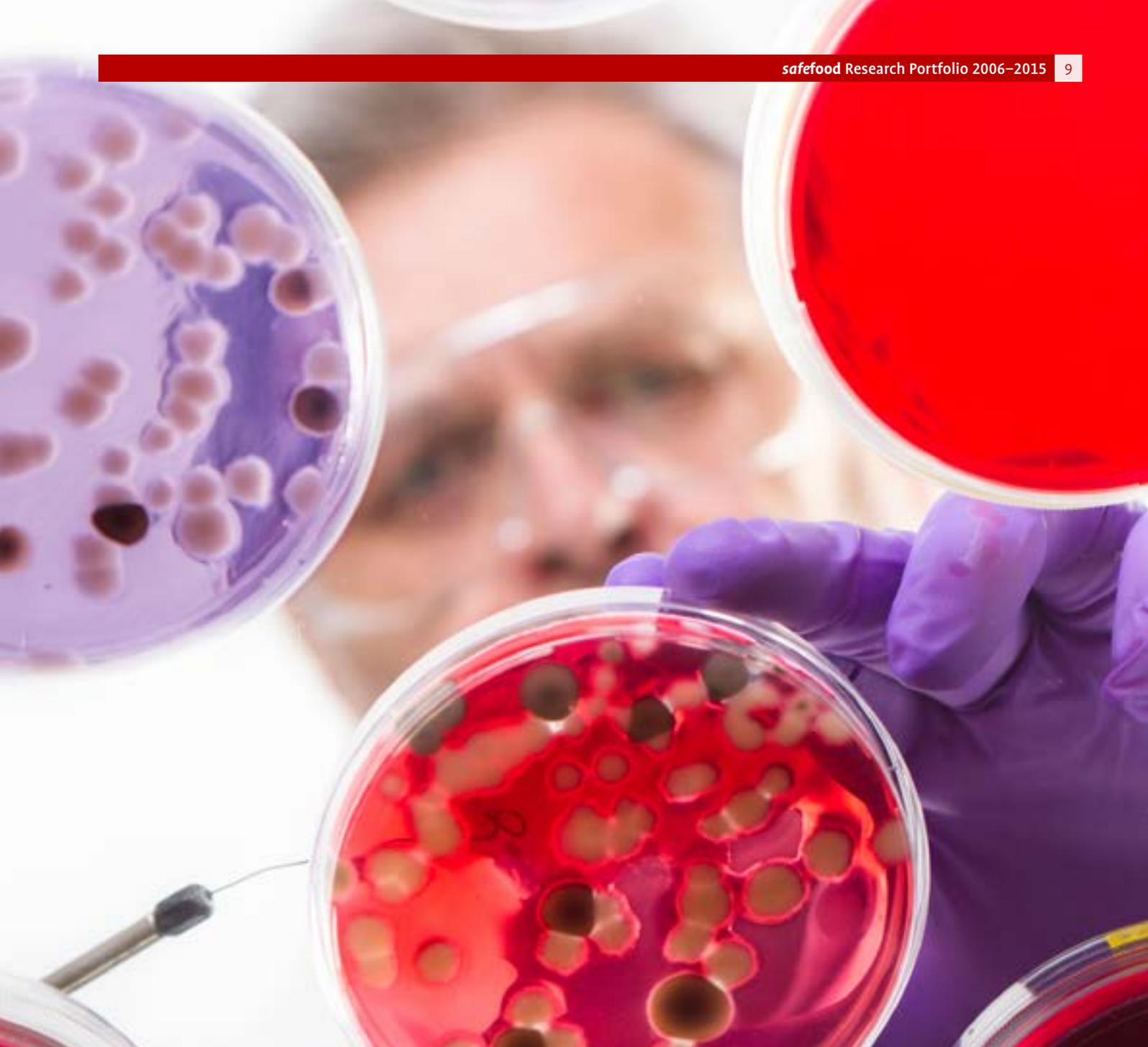
Given its foundational ethos, **safefood** emphasises the desirability of North-South cooperation and the overwhelming majority of projects have had a cross-border element. Not only does this promote North-South interaction between researchers working in similar areas, but it also ensures the research capacities in both jurisdictions are harnessed for the benefit of the Island of Ireland consumer and agri-food industry.

Find out more about research procurement

Visit <http://www.safefood.eu/researchportfolio>

Call Helpline ROI 1850 404 567 / NI 0800 085 1683

Email info@safefood.eu



1. Microbiology & Food Hygiene

The main objective of our research into the microbiological aspects of food safety is to increase our understanding of how and where pathogenic microorganisms enter the food chain, their prevalence and distribution. The **safefood** approach has been multi-sectoral: projects have focussed on examining the microbiological aspects of food safety in the home, the catering industry and food production plants as well. The emphasis has been on interventions to control and prevent microbial contamination thereby augmenting food safety right across the food chain.

1.1. Trust makers, breakers and brokers: building trust in the food system on the island of Ireland

Principal Contractor: Dr Seamus O'Reilly, University College Cork

Collaborator(s): Single supplier

Abstract: Food scares and crises have both immediate and more long-term impacts on consumer perceptions and behaviour. A succession of crises can undermine consumer confidence and trust in the food industry and the regulators tasked with its oversight. This multi-method research seeks to provide an insight into how key stakeholders contribute to building, maintaining and rebuilding trust in the food system on the Island of Ireland. Specifically the study aims to:

- Explore and understand trust in food systems in an era of intensive globalisation
- Explore how to develop, maintain and rebuild consumer trust in response to food scares and bad publicity
- Ascertain current perceptions on the role of media and PR agents that guides consumer practices in response to food crises
- Investigate the role of industry and consumer organisations as trust brokers in developing, maintaining or repairing trust during food crises
- Map out the procedures by which regulatory authorities build, maintain and rebuild trust in food systems
- Develop and 'sense-check' models of trust building, trust maintenance and trust repair
- Participate in an international research focus on this issue.

Commencement Date: January 2015 **Project Duration:** 18 months **Status:** Ongoing

1.2. Understanding consumer behaviour in the usage of hand sanitisers and establishing their efficacy

Principal Contractor: Dr Moira Dean, Queen's University Belfast

Collaborator(s): Single supplier

Abstract: Hands serve as vectors for the transmission of pathogens to food and drink and good hand hygiene is a fundamental element of combatting food borne illness worldwide. This promotes effective handwashing requiring warm water and soap with a reliance on hand sanitizing gels in situations where these are unavailable. Indications are that the availability and usage of hand sanitizing gels has increased in recent times. This project, which will include a literature review, will investigate the efficacy and consumer use of hand sanitizer gels on the Island of Ireland. In particular the project will ascertain:

- The frequency and circumstances in which they are used
- Their efficacy in removing foodborne pathogens, including norovirus in comparison to hand-washing with soap and water
- Consumer understanding of their efficacy and appropriate use
- The barriers to the use of soap and water for hand washing amongst consumers
- The alcohol and antiseptic contents of hand sanitisers
- The presence or absence of anti-microbial product labelling.

Commencement Date: December 2014 **Project Duration:** Six months **Status:** Ongoing

1.3. Risk profiling *Listeria* in ready-to eat foods (RTE) and determination of control strategies and practical interventions

Principal Contractor: Dr Robert Madden, Agri-Food and Biosciences Institute, Belfast

Collaborator(s): Dr Kieran Jordan, Teagasc Food Research Centre, Moorepark, Co. Cork
Dr Mike Hutchison, Hutchison Scientific Ltd. Axbridge
Dr Roisin Scullion, College of Agriculture, Food and Rural Enterprise, Cookstown, Co. Tyrone

Abstract: This project involves the risk profiling of *Listeria* in ready-to-eat foods (RTE) and determination of control strategies and practical interventions for food processors across Northern Ireland. The study is based on an equivalent project carried out in the Republic of Ireland (RoI) under the Food Institutional Research Measure (FIRM) translational research programme. The objectives of the project are:

- To carry out a comprehensive review of the literature around *Listeria monocytogenes* in the cooked sliced meat processing environment, and existing control strategies
- To recruit approximately 30 food processors in Northern Ireland from a range of agricultural sectors for training on sampling for *Listeria monocytogenes*
- Six environmental samples, and two food samples will be taken from each premises on a bi-monthly basis for 18 months and analysed for *Listeria*
- Isolates will be used in studies designed to ascertain the causes of persistence in the processing environment, growth in the foods produced at the facilities and the disease potential of the isolates
- Isolates will also be used in studies designed to develop control strategies for *Listeria monocytogenes*
- Dissemination of results through the **safefood** *Listeria* Network, and targeted workshops aimed at up skilling food business operators, regulators, vets, etc.

Commencement Date: December 2014 **Project Duration:** 24 months **Status:** Ongoing

1.4. Emerging issues: an analysis for Verocytotoxigenic *Escherichia coli* on the island of Ireland

Principal Contractor: Dr Brigid Lucey, Cork Institute of Technology

Collaborator(s): Single supplier

Abstract: This project will assess the capacity for the detection and characterisation of VTEC *E.coli* (incl. O157 and non-O157 serogroups) on the Island of Ireland, and will assist in identifying any gaps in the current arrangements as well as examining international best practice in this area. The aim of this study is to conduct desk research to examine the current procedures and capacity for the detection of VTEC in food, animal and human clinical samples on the Island of Ireland, and to investigate best practice in this area.

The objectives of the project are:

- To describe the capacity on the Island of Ireland for laboratories, both research and analytical, in the public sector to test for VTEC in both O157 and non-O157, including screening for pathogenicity genes
- To collate available data throughout the Island of Ireland on O157 and non-O157 VTEC detection in samples derived from animals, food and human sources
- To outline the capacity for O157 and non- O157 VTEC analysis in other countries in animal, food and human sources and any possible examples of international best practice in such analytical approaches.

Commencement Date: August 2014 **Project Duration:** Six months **Status:** Ongoing

1.5. A study of domestic fridges on the island of Ireland

Principal Contractor: Dr Tassos Koidis, Queen's University Belfast

Collaborator(s): SMR Research, Belfast
Cuthbertson Laird Group, Belfast

Abstract: This project investigated consumer practices and operational parameters associated with domestic fridges from a stratified sample of households across the Island of Ireland. The data from the study will enable **safe food** to develop targeted consumer advice to address ongoing deficits in consumer knowledge and behaviour relating to safe food storage. With the introduction to the market of new fridge designs and recent changes to consumer food preparation behaviours, there is a need to develop the evidence base and identify possible interventions to protect public health around correct food storage.

Commencement Date: September 2013 **Project Duration:** Six months **Status:** Completed

1.6. Assessment of antibiotic resistant *Escherichia coli* in meat production systems on the island of Ireland

Principal Contractor: Dr Robert Madden, Agri-Food and Biosciences Institute, Belfast

Collaborator(s): Prof Martin Cormican & Dr Cyril Carroll, National University of Ireland, Galway

Abstract: This project will assess the pathogenic potential of antibiotic resistant *Escherichia coli* (AREC), particularly those producing Extended Spectrum Lactamase (ESBL), in foods derived from animal production systems and to define the potential risks posed by these organisms to the consumer on the Island of Ireland. The study will conduct a thorough definition of the phenotypic and genotypic properties of positive isolates, allowing the similarities of the isolates to be statistically defined. Based on these properties, the risk due to the pathogenic potential of ESBL-producing bacteria in the food chain for consumers on the island will be defined. The possible origins and dispersal mechanisms of the AREC will be considered and possible prophylactic measures proposed to limit exposure by consumers to ESBL-producing bacteria.

Commencement Date: June 2013 **Project Duration:** 18 months **Status:** Ongoing

1.7. Assessment of the ability of dishcloths to spread harmful bacteria to other kitchen surfaces and determination of the effectiveness of various dishcloth cleaning regimes

Principal Contractor: Prof David McDowell, University of Ulster

Collaborator(s): Single supplier

Abstract: Dishcloths are routinely used in many domestic kitchens to clean worktops and other contaminated food contact surfaces. The prospect that such dishcloths may actually harbour pathogenic bacteria such as *E. coli*, *Salmonella* and subsequently facilitate the spread of these microorganisms during cleaning is of concern to **safe food**. Indeed a previous study commissioned by **safe food** showed that a range of foodborne pathogens survive on dishcloths for at least a day, and that such reservoirs of potentially dangerous bacteria may lead to cross contamination within the kitchen environment, thus increasing the possibility of food poisoning (McDowell et al. 2010). This project built upon the outcomes of a previous dishcloth survey and provided solutions to consumers upon which advice can be based and communication activities designed.

Commencement Date: November 2011 **Project Duration:** Five months **Status:** Completed

1.8. The microbiological status of household dishcloths and associated consumer hygiene practices on the island of Ireland

Principal Contractor: Ms Martine De Boer, Eolas International Research Ltd. Co. Cork

Collaborator(s): Ms Janet Francis and Ms. Catherine Cockcroft, EXOVA, Birmingham

Abstract: Dishcloths play a role in every kitchen in so far as they clean worktops and surfaces of visible contamination. However, one of the most dangerous sources of virulent bacteria including *E. coli*, *Salmonella* and others, is the typical kitchen dishcloth, as food residues adhere to the surface. These food residues, together with the moisture retained in the dishcloths, offer a favourable environment for bacterial growth. Studies indicated that various bacteria survive on dishcloths for hours or days after initial contact with microorganisms which may lead to cross contamination within the kitchen environment increasing the possibility of food poisoning. The objective of this project was to carry out a survey of 200 in use household dishcloths to elucidate their microbiological profiles.

Commencement Date: August 2011 **Project Duration:** Six weeks **Status:** Completed

1.9. Communicating to consumers about food hazards in the home

Principal Contractor: Prof Patrick Wall, University College Dublin

Collaborator(s): Dr Jean Kennedy, European Food Information Council, Brussels

Abstract: This project determined the precursors to food safety behaviour and decision-making processes of the 120 participants in the study. This project investigated how different stimuli are perceived by different individuals, and ascertained the key psychological factors which underpin food safety decision-making processes and behaviour. Specifically, the ability to process new information; motivation to process new information; desire/perceived need to process new information; preferences for central or peripheral processing stimuli; perceptions and heuristics; trust and recall of risk messages were measured. The outcome is a fuller picture of how different messages resonate with particular consumer profiles, and adds to the overall evidence base on which to build food safety messages for delivery across the Island of Ireland.

Commencement Date: August 2010 **Project Duration:** 15 months **Status:** Completed

1.10. Survey to determine the presence of *Salmonella* and *Campylobacter* in retail packs of raw chicken purchased throughout the Republic of Ireland

Principal Contractor: Dr Robert Madden, Agri-Food and Biosciences Institute, Belfast

Collaborator(s): Single supplier

Abstract: This study determined the presence of *Salmonella* spp. and *Campylobacter* spp. in retail packs of raw chicken purchased throughout the Republic of Ireland. Overall 500 packs of raw chicken were purchased and analysed. The results were then compared with studies from around the world to allow their relative significance. The prevalence of *Salmonella* spp. and *Campylobacter* spp. in retail packs of raw chicken in the Republic of Ireland was defined. This study benchmarked the prevalence of these two major foodborne pathogens in the Republic of Ireland.

Commencement Date: January 2009 **Project Duration:** 12 months **Status:** Completed

1.11. A survey of retail cold sliced meats with particular reference to the presence of *Listeria monocytogenes* and *Clostridium botulinum* toxin, to include reduced-salt and reduced-fat products

Principal Contractor: Dr Robert Madden, Agri-Food and Biosciences Institute, Belfast

Collaborator(s): Single supplier

Abstract: This survey provided valid and reliable data on the numbers and range of the complete list of foodborne indicator organisms from ready-to-eat cold cooked sliced meats sold at retail throughout the Republic of Ireland. In addition, information on the incidence of *Clostridium botulinum* toxin in such products was provided, as was data on the chemical composition and water activity of the products tested. The extent and range of products tested, together with the breadth of analyses undertaken, identified the extent to which such products contribute to the foodborne infections and illnesses in the Republic of Ireland. This data complements similar surveys carried out in recent years in Great Britain, where the incidence of listeriosis has increased in recent years.

Commencement Date: December 2008 **Project Duration:** 15 months **Status:** Completed

1.12. Control of *Campylobacter* in poultry: development of a dissemination programme for lessons for farmers on the island of Ireland

Principal Contractor: Dr Robert Madden, Queen's University Belfast

Collaborator(s): Single supplier

Abstract: This study determined best practices for the control of *Campylobacter* on poultry farms, based on mining the data produced by the Northern Ireland IRTU study. This was updated and combined with published studies to produce a concise list of current best practices which was then widely disseminated in the poultry farming community across the Island of Ireland in order to assist in meeting the goal of *Campylobacter*-free broilers. Experiences in Iceland and Belgium have shown that this would assist in the reduction of *Campylobacter* food poisoning in the human population.

Commencement Date: April 2008 **Project Duration:** 12 months **Status:** Completed

1.13. Assessment of the critical control points during domestic food preparation on the island of Ireland

Principal Contractor: Prof Patrick Wall, University College Dublin

Collaborator(s): Prof David McDowell, University of Ulster

Abstract: Poor food-handling and hygiene practices in domestic kitchens are thought to be the cause of a significant amount of foodborne illness. In this study, the critical control points during food preparation were assessed via:

- Video observation of consumers in their own homes and in test kitchens
- Microbiological swabbing of key areas in all kitchens before and after food preparation
- An audit checklist for each participant which will be developed and validated in the test kitchens for use during the domestic food preparation.

Households of single people, couples, families, males and females from a range of socioeconomic backgrounds were represented in this study. The participants who prepared food in their own homes were given a shopping list and asked to purchase their own ingredients. They were also given a temperature logger which they were asked to attach to the packaging of the meat/poultry products as soon as they were placed into the shopping basket. The final outcomes identified and assessed the critical control points in domestic food preparation in terms of cross-contamination risk and microbial loading, cooking practices and temperature control (and data relating to cleaning activities). The study also identified discrepancies between food safety practice and reported behaviour.

Commencement Date: January 2008 **Project Duration:** 15 months **Status:** Completed

1.14. Determination of the appropriate cooking regimes for recommendations for the safe roasting/cooking of stuffed turkey

Principal Contractor: Ms Joy Gaze, Campden & Chorleywood Food Research Association, Gloucestershire

Collaborator(s): Single supplier

Abstract: This evidence-based study reviewed the standard cooking advice for stuffed and unstuffed turkeys to ensure food safety whilst maintaining the sensory qualities of the meat. The study provided appropriate cooking times and temperatures for a range of different sizes of bird in fan assisted ovens and investigated the effect of stuffing on the microbiological safety and sensory acceptability of cooked turkey. This has allowed **safefood** policy to be developed in relation to consumer advice where empirical data did not previously exist and expert opinion was used. This has facilitated the organisation in addressing consumer enquiries and producing consumer communications in the Christmas 2007 campaign.

Commencement Date: October 2007 **Project Duration:** Six weeks **Status:** Completed

1.15. To determine the food hygiene indicators that can be used by customers to objectively judge hygiene standards in retail and food services

Principal Contractor: Mr Martin Roper, Excellence Ireland Quality Association, Dublin

Collaborator(s): Single supplier

Abstract: A **safefood** media campaign commenced in August/September 2007 aimed at promoting good food hygiene standards in food outlets and empowering customers to address any issues that they may find. Compliance with food safety standards is enforced by other agencies. However, from the perspective of the consumer, a need exists to develop a simple 'customer checklist' that could be used by anyone purchasing food in food businesses. The objectives of this project was to develop a 'customer checklist' of food hygiene indicators that can be used by customers to help them objectively judge the standards of food safety and hygiene in retail and food service outlets. A key part of the checklist development process was a pilot programme of 'mystery shopper' audits in a sample of sixty food operations across the Island of Ireland with thirty locations in NI and thirty locations in the Republic of Ireland. The pilot programme was conducted by experienced auditors with detailed knowledge of the food retail and service sectors.

Commencement Date: September 2007 **Project Duration:** Three months **Status:** Completed

1.16. Survey of retail smoked fish with particular reference to the presence of *Listeria monocytogenes*

Principal Contractor: Dr Jeff Banks, Food Safety Assurance, North Littleton, UK

Collaborator(s): Single supplier

Abstract: This study examined ready-to-eat (RTE) retail smoked fish with particular reference to *Listeria monocytogenes*. Samples of RTE hot and cold smoked fish were purchased from retail outlets throughout the Republic of Ireland and analysed. Overall contamination by *Listeria* spp. was 10.2 per cent (all at acceptable levels). The pathogen was detected in 4.7 per cent of samples at <10 cfu/g. Of the 105 samples of cold smoked fish tested, 19 (18.1 per cent) contained *Listeria*; nine of which were *Listeria monocytogenes*. Of the 151 samples of hot smoked fish tested seven contained *Listeria*; two of which were *Listeria monocytogenes*. The survey revealed that salmon was the most common fish contaminated with *Listeria* spp. with 22 positive isolations; 10 of which were *L. monocytogenes*. Mackerel was less frequently contaminated with three positive *Listeria* isolations; two of which were *L. monocytogenes*. Trout showed the lowest prevalence of contamination for *Listeria* spp. Neither *Salmonella* nor *E. coli* were detected in any sample while nine samples contained *Staphylococcus aureus*. Enterobacteriaceae were detected in just two of the 256 samples taken.

Commencement Date: October 2006 **Project Duration:** Three months **Status:** Completed



2. Chemistry & Toxicology

There is ongoing public concern over the potential presence of agrochemical residues and environmental and process contaminants in food. This concern is aggravated from time to time by high-profile cases of food fraud such as the contamination of milk-based foods with melamine in Eastern Asia. **safefood** has responded to this concern by enhancing analytical capacity for detecting residues and contaminants in food, and also through the development of implementable solutions to prevent contamination of food from happening in the first place. Research has also been carried out into the development of analytical solutions for assuring consumers of the provenance of the food products they buy and for ascertaining the food security of vulnerable groups within the population. **safefood** continues to support investigations into cross-cutting issues of potential significance for both public health and the agri-food economy such as Climate Change, as well as approaches to identify and prepare for emerging food safety issues.

2.1. Food security for the food sensitive consumer on the island of Ireland

Principal Contractor: Dr Tassos Koidis, Queen's University Belfast

Collaborator(s): Dr Audrey Dunn Galvin, University College Cork
Mr Michael Walker, Michael Walker Consulting Ltd. Belfast
Ms Hazel Gowland, Allergy Action, St. Albans
Mr Michael Bell, Northern Ireland Food and Drink Association, Belfast

Abstract: The prevalence of food sensitivity on the Island of Ireland could be as high as 40 per cent. The prevalence of food allergy is increasing, especially among children, and there are no clear answers as to why. Therefore, a significant proportion of the population have to follow an avoidance diet on a daily basis. They must deal with the a plethora of labelling options, least of all the vagaries of precautionary labelling, and must rely on the competence of catering staff to ensure their health is protected when dining out.

This project will involve an in-depth desk-based study on the food security for the food sensitive consumer on the Island of Ireland. The main objective is to capture the key factors determining their food choice when procuring pre-packed food. Who do they trust, what obstacles do they routinely face and what is the impact on their quality of life? In addition to a critical review of scientific and other literature, focus group discussions with food sensitive consumers and an e-survey will be carried out. These methods should enable meaningful conclusions to be drawn and key recommendations made.

Commencement Date: December 2014 **Project Duration:** Nine months **Status:** Ongoing

2.2. Exploration of novel technologies to provide rapid and cost-effective methods for counteracting food fraud

Principal Contractor: Prof Chris Elliott, Queen's University Belfast

Collaborator(s): Prof Tom Buckley, Irish Equine Centre, Co. Kildare

Abstract: Almost any food commodity can be the subject of food fraud which includes substitution fraud, addition fraud and country of origin fraud, among others. Three different techniques that will detect all of the types of fraud will be investigated and if appropriate will be fully validated.

Loop mediated isothermal or 'LAMP' is a nucleic acid amplification technique with advantages over traditional PCR. It will be used in speciation studies. Benchtop NMR will be used to profile cold-pressed rapeseed oil, a high value artisan product being produced in Ireland and prone to adulteration with cheaper oils. Rapid evaporative ionization mass spectrometry (REIMS) will be used in conjunction with dissection for tissue identification as an approach termed 'intelligent knife' (iKnife). This will be applied, for the first time, to differentiate between meat types and fish species, for its ability to detect chemical contamination of meat and also give information about the geographic origin of meat simultaneously.

All procedures will be demonstrated to a wide range of industry and governmental stakeholders. Work on a wide range of foods known to be very prone to fraud will be carried out, namely

1. Cheese
2. Fish
3. Red meat
4. Rapeseed oil

all very important commodities produced and sold on the Island of Ireland. A successful outcome of this research will bring about a paradigm shift in food fraud detection.

Commencement Date: November 2014 **Project Duration:** 24 months **Status:** Ongoing

2.3. The impact of climate change on food safety: an island of Ireland perspective

Principal Contractor: Prof Chris Elliott, Queen's University Belfast

Collaborator(s): Single supplier

Abstract: Global climate change will inevitably disrupt the world's food production systems. How, and to what extent, continues to present a challenge for climate prediction scientists, particularly with regard to predicted changes at a local level. The interface of climate change and food security has understandably been the subject of much scrutiny. However, within this definition, the impacts upon food safety have received comparatively little attention. The Island of Ireland is a highly developed region, yet its largest industry remains agriculture and therefore the effects of climate change on food production and food safety are of particular economic and public health relevance.

safefood commissioned the Institute for Global Food Security at Queen's University Belfast to undertake a literature based review on the potential impacts of climate change on food safety from an Island of Ireland perspective. The review assessed the potential impacts of climate change on food safety and highlighted those areas of the food chain that are most likely to be impacted. Recommendations to ameliorate those impacts were also suggested.

This report represents the most comprehensive assessment yet of the climate-related difficulties we face relating to the production of safe food on the Island of Ireland.

Commencement Date: September 2013 **Project Duration:** 15 months **Status:** Completed

2.4. Protecting consumer choice: ensuring the provenance of artisan foods produced on the island of Ireland

Principal Contractor: Prof Gerard Downey, Teagasc Food Research Centre, Ashtown, Dublin

Collaborator(s): Prof Chris Elliott, Queen's University Belfast

Abstract: The provenance of processed foods is a significant quality attribute for many consumers. However, widespread mislabelling or adulteration of high-value foods is known to take place on a global scale and, with regard to Irish farmhouse cheeses, it is believed that the mislabelling of imported foreign cheeses as Irish does happen and may be a growing problem. There is also concern that not all cheeses sold with Irish-sounding brand names originate on the Island of Ireland.

An analytical effort is therefore warranted to facilitate the development of methods to confirm the 'Irish origin' claims of such products. This project, which is a collaboration between Teagasc Food Research Centre, Ashtown and the Institute for Global Food Security in Queen's University Belfast, aims to develop a robust fingerprint model which will characterise Irish-produced farmhouse cheeses using these analytical approaches. The possibility of labelling solutions to augment consumer choice will also be explored.

Commencement Date: September 2013 **Project Duration:** 23 months **Status:** Ongoing

2.5. Development of a Risk Register for both the pig and poultry meat sectors on the island of Ireland: food hazard select

Principal Contractor: Prof Chris Elliott, Queen's University Belfast

Collaborator(s): Dr Martin Danaher, Teagasc Food Research Centre, Ashtown, Dublin
Prof Francis Butler, University College Dublin

Abstract: Contamination and adulteration of food products is an ever increasing problem that is reported in the media. Such reports serve to alarm the public and cause a loss of faith in food producers. Many of these incidents are due to the complexity of the food supply chain and often catch companies totally unaware. Work has been pioneered by The Institute of Global Food Security at Queen's University Belfast in developing a risk management system for the animal feed industry on the Island of Ireland. The database outcome from this work is now being implemented by a large number of UK and Irish companies that import feed materials onto the Island of Ireland to target their monitoring programme for contaminants.

The concept of developing a similar risk register (*Food Hazard Select*) for pig and poultry foods produced on the Island of Ireland is the subject of the current proposal. The pork and poultry industry are major employers on the Island of Ireland and export large quantities of products. The quality and safety of these products is of paramount importance and any issues in relation to either parameter can cause massive reputational damage, not only to the company involved but the entire industry. A system will be developed to produce a Risk Register based on analysing data from a wide range of existing sources, some in the public domain and some confidential.

The information will be ranked for severity of impact and will be used by the industry to fine tune their testing programmes. Thus the amount of industry testing can be increased while at the same time significantly reducing analytical costs. With regards to the major risks identified the project will set out to identify better means of testing based on recent advances in analytical and bio-analytical sciences. Participating industries will receive a series of recommendations about what methods to make use of, either in their own laboratories, governmental laboratories and of commercial testing facilities.

Commencement Date: August 2013 **Project Duration:** 21 months **Status:** Ongoing

2.6. Nanotechnology in the agri-food industry on the island of Ireland: applications, opportunities and challenges

Principal Contractor: Prof Chris Elliott, Queen's University Belfast

Collaborator(s): Dr Maeve Henchion, Teagasc Food Research Centre, Ashtown, Dublin

Abstract: The use of nanotechnology in the AgriFood industry has increased in recent years and it is predicted to grow rapidly over the next few years. Its potential for providing safer and more nutritious foods is important; however, there are still many uncertainties about the technology and its applications.

This review addressed the risks and opportunities from a range of nanotechnology applications in the AgriFood industry on the IoI. It involved an analysis of the current literature and an interrogation of the current regulatory and industrial knowledge base to identify and rank the likely impacts of nanotechnology on the AgriFood industry as well as the implications for consumer health, choice and confidence. The project also considered possible communications options/strategies which would foment trust and thereby underscore consumer confidence in the technology and the regulatory regime.

Commencement Date: July 2013 **Project Duration:** Five months **Status:** Completed

2.7. An investigation into the usage of Monosodium Glutamate in the ethnic food catering industry

Principal Contractor: Dr Fred Davison, Cork Public Analyst Laboratory

Collaborator(s): Environmental Health Service, Health Services Executive, Cork
Environmental Health Service, Belfast City Council

Abstract: Monosodium glutamate (MSG) is a flavour enhancer commonly added to Chinese food, canned vegetables, soups and processed meats. Although it is permitted as a food ingredient in the EU and elsewhere, the use of MSG remains controversial. In the EU, MSG like other permitted food additives, must appear on the label if used as a deliberate ingredient and has been ascribed the E number 621. MSG has been used as a food additive for decades. Anecdotal reports of adverse reactions to MSG have been reported. Symptoms include headache, flushing, sweating, facial pressure or tightness, numbness, tingling or burning in face, neck and other areas, heart palpitations, chest pain, nausea and weakness. Adverse reactions are simply known as 'MSG symptom complex'; there is no definitive evidence of a causal link between MSG consumption and these symptoms. The consumption of MSG is essentially a consumer choice issue.

This survey investigated MSG usage in Chinese, Indian and Thai restaurants and take-away outlets in Cork and Belfast. MSG use varied considerably from one premises to another. The number of premises that used excessive amounts of MSG was very low. Importantly, the results showed that even where MSG is not used, you can still get free glutamate from other ingredients. MSG-free options always had much lower free glutamate levels indicating that a request for an MSG-free meal can be accommodated. Since free glutamate was detected in all cuisine tested, it is in the interests of the staff to advise their customers that (a) they don't add MSG to their dishes or, where it is added, this step can be omitted, and (b) their dishes may contain free glutamate from other ingredients.

Commencement Date: December 2010 **Project Duration:** Six months **Status:** Completed

2.8. A meat speciation survey of selected meat products at retail level

Principal Contractor: Dr Fred Davison, Cork Public Analyst Laboratory

Collaborator(s): Single supplier

Abstract: Regulatory food authorities strive to promote honest and informative labelling to help consumers make informed choices. This aspiration must be substantiated by activities to check whether food is mis-described. EU legislation requires meat to be labelled with the animal species from which it comes, and to quantify the meat ingredients. Mechanically recovered meat falls outside this definition and cannot count towards the meat content. Similarly, other parts of the carcass such as heart, liver, kidney, etc. must also be labelled separately, and the generic term 'offal' is not permitted. Therefore, in order to check compliance with these labelling requirements, analytical DNA-based techniques are available to detect and quantify meat species and other meat ingredients in meat products. A number of species-specific methods have been developed for the detection of beef, lamb, pork, chicken and turkey.

The purpose of this project was to enhance the capacity of the Public Analyst system on the Island of Ireland by facilitating the implementation of methods that could then be used to determine the authenticity of processed meat products. Method development concentrated on chicken burgers and sausages (cheaper brands). The project was part of an ongoing collaboration between **safefood** and the Public Analyst Laboratories and in this instance involved the Cork Public Analyst Laboratory which has been designated the National Reference Laboratory for meat speciation by the Dept. of Health & Children. In conjunction with the project, Cork PAL personnel availed of the Training and Mobility Programme travel grant scheme of the **safefood** Knowledge Networks to attend the JRC Joint Research Centre, Molecular Biology and Genomics Unit in Warsaw.

Commencement Date: December 2010 **Project Duration:** Six months **Status:** Completed

2.9. A survey to ascertain the ability to purchase a gluten-free meal on request in a restaurant setting

Principal Contractor: Mr Rory Mannion, Western Region Public Analyst's Laboratory, Galway

Collaborator(s): Environmental Health Services, Health Services Executive
Environmental Health Services, Northern Ireland District & Borough Councils

Abstract: The objective of this research was to:

1. Ascertain the level of awareness of dietary needs of coeliacs among restaurant industry staff;
2. Determine the possibility of purchasing a gluten-free meal on request in a restaurant setting using methodology that is directly relevant to those with coeliac condition;
3. Ascertain if the level of knowledge of coeliac condition and the response to a request for a gluten-free meal differ between those restaurants listed as Coeliac-friendly and those which are not listed;
4. Quantitatively analyse 300 restaurant meal samples for gluten using an approved laboratory methodology; and
5. Inform the need for measures to augment awareness of coeliac condition in the restaurant industry.

The survey showed that the vast majority of restaurants on the Island of Ireland are able to accommodate a diner's request for a gluten free meal. However, it also highlighted that often serious mistakes can still be made, even when customers are presented with gluten free choices in coeliac friendly restaurants. The research showed how vitally important it is that all staff are aware of the coeliac condition and the importance of gluten free food and the importance of good communication with coeliac customers.

Commencement Date: June 2009 **Project Duration:** Four months **Status:** Completed

2.10. Development of a Prototype Assay for Azaspiracid Detection in Shellfish

Principal Contractor: Prof Chris Elliott, Queen's University Belfast

Collaborator(s): Prof Richard O'Kennedy, Dublin City University
Dr Ambrose Furey, Cork Institute of Technology

Abstract: Azaspiracid is a proven toxin which has adversely affected the health of consumers who have eaten contaminated shellfish. Though the problem has been identified in several parts of the world, Ireland remains the most affected country in the world. There had been no means of performing rapid detection for the toxin, either in algal blooms or in shellfish meat. Regulatory laboratories, public health laboratories and the aquaculture industry had all identified a need to monitor for the presence of AZA toxins.

The ability to detect the toxin in the early stages of contamination would permit the proactive closure of contaminated beds thereby arresting any risk of exposure and ill-health in consumers. A rapid test based on a biosensor kit was developed which uniquely involved the production of an antibody to the toxin. The kit was able to detect AZA toxins at or below the regulatory limit.

Commencement Date: October 2007 **Project Duration:** 12 months **Status:** Completed



3. Nutrition & Healthy Eating

The relationship between nutrition and health is clear. The quality and quantity of food we eat influences our risk of two main causes of morbidity and mortality, cardiovascular disease and cancer. Coronary vascular diseases account for approximately 30 per cent of all deaths each year – equating to approximately 17.3 million people worldwide.

In general, lifestyle related diseases (referred to as non-communicable diseases (NCDs)) are the leading causes of deaths worldwide; more people die from NCDs than from all other causes combined. Nutrition related issues, in particular obesity, are among the key public health threats facing all countries, including UK and Republic of Ireland. Food poverty has emerged as an issue of policy debate in Ireland in recent times. Defined as the inability to have an adequate and nutritious diet due to issues of affordability or accessibility; food poverty is a complex issue with many health and social dimensions interlinked. Given **safefood's** all-island remit, it is uniquely placed to make a valuable contribution in tackling obesity, food poverty and other nutrition related issues on an all-island basis.

While **safefood's** research in terms of nutrition and healthy eating is not necessarily expansive, it nonetheless aims to contribute to policy development. The research ranges from assessing the nutritional status of specific population groups to understanding people's knowledge and understanding of relevant topics such as portion size. It is used to underpin **safefood's** communication activities, particularly direct marketing to consumers.

3.1. Nutrition take out series – wrap style sandwiches and Indian takeaway foods

Principal Contractor: Dr Ruth Price, University of Ulster

Collaborator(s): Single supplier

Abstract:

safefood have previously funded surveys that have provided a ‘snapshot’ of the nutritional content of commonly consumed take-away foods. These have included soups, pizzas, burgers and Chinese takeaway. The results have informed consumer messages about making healthier food choices when eating food out of the home.

This research extended these surveys to include Indian takeaway food and wrap style sandwiches. Based on the most popular Indian takeaway starters and main dishes and wrap style sandwiches the research:

1. Carried out a survey in a variety of outlets across the island in both urban and rural locations;
2. Carried out nutritional analysis (energy, total fat, saturated fat, protein and salt) of popular Indian takeout foods and of popular wrap style sandwiches; and
3. Compared the nutritional composition of Indian take out foods and of wrap style sandwiches to readymade supermarket versions.

Commencement Date: July 2013 Project Duration: 12 months Status: Ongoing

3.2. The cost of overweight and obesity on the island of Ireland

Principal Contractor: Prof Ivan Perry, University College Cork

Collaborator(s): Dr Anne Dee, HSE Department of Public Health, Limerick
 Prof Ciaran O’Neill, National University of Ireland, Galway
 Prof Frank Kee, Queen’s University Belfast
 Prof Anthony Staines, Dublin City University
 Prof Kevin Balanda, Institute of Public Health in Ireland, Dublin
 Dr Linda Sharp, National Cancer Registry, Cork

Abstract:

This study provided a comprehensive assessment of the cost of overweight and obesity on the Island of Ireland. Costs was measured from the perspective of public and private funded health services in relation to health and social costs and also examined costs associated with time lost at work due to ill health associated with overweight and obesity.

A thorough review of the existing international literature on the costs of overweight and obesity was carried out, as were the methods used.

Commencement Date: February 2011 Project Duration: 18 months Status: Completed

3.3. Food marketing and the preschool child

Principal Contractor: Prof Patrick Wall, University College Dublin

Collaborator(s): Prof Barbara Livingstone, University of Ulster
Dr Moira Dean, Queen's University Belfast

Abstract: The overall aim of the project was to investigate the level and types of exposure of young children to marketing of unhealthy food and to examine its influence on family food purchases and children's nutritional status. A literature review explored the relationship between food marketing practices and children's diets, explored methodologies in this domain and examined current policies globally.

- A survey of food advertising and marketing channels used to target preschool children on the lol provided a greater understanding of the various marketing strategies used to promote food, particularly to preschool children
- A detailed content analysis of the principle marketing channels used to target preschool children was carried out to assess their exposure to marketing messages for unhealthy and healthy foods
- Childcare workers' and teachers' understanding of the intent of advertising and its influence on children's food choice was assessed to examine whether marketing messages are actively promoted in the preschool/school setting
- A study of preschool children and their parents was conducted to determine the children's understanding of nutrition, their ability to absorb information from marketing and to identify parents' perception of the influences of advertising on young children's food choice/demands
- Preschool children's understanding of the purpose of advertising, what information they take from advertisements, whether they remember that information and whether they can distinguish an advertisement from a programme was examined
- A qualitative study established parents' understanding of the intent of advertising specifically and its influence on their children's food choice, and also to provide parents with the necessary knowledge and skills to mediate the effects of food advertising
- A survey tool examined parental attitudes and experiences of food advertising and its impact on diet habits of preschool children.

Commencement Date: January 2011 **Project Duration:** 36 months **Status:** Completed

3.4. Nutrition take out series – pizza, burgers and Chinese takeaways

Principal Contractor: Dr Fidelma Kirwan, Eolas International Research Ltd. Little Island, Co. Cork

Collaborator(s): Food Analytical Laboratories, Oxford Road, Stoke-on-Trent
Agri-Food and Biosciences Institute, Hillsborough, Co Down

Abstract: This project aimed to provide up-to-date information on the nutrient content of takeaway foods. Demand for takeaway foods has been primarily driven by current social and economic trends such as the increase in the number of women in the work place, the move away from the traditional evening meal and a rise in disposable income levels. The ethnic takeaways and burger bar segments account for the majority of the growth which the overall market has been experiencing. There is an established link between diet and health with fast foods contributing higher levels of salt and fat compared to traditional home cooked meals. Heavy salt and saturated fat consumption is associated with high blood pressure leading to strokes and heart attacks which together are the single highest cause of death in Ireland. In order to provide up-to-date information on the nutrient content and for the specific purposes of this study, beef burgers, pizza and Chinese food (from a selection of catering outlets) was collected on a phased basis and the nutritional composition determined.

Commencement Date: December 2010 **Project Duration:** 20 months **Status:** Completed

3.5. Early school leavers: a needs assessment from a nutrition perspective

Principal Contractor: Dr Michelle Share, Trinity College Dublin

Collaborator(s): Dr Barbara Stewart-Knox, University of Ulster

Abstract: This project aimed to carry out a systematic review of the services, structures and networks for early school leavers in both Northern Ireland and the Republic of Ireland. A telephone survey of existing service providers was carried out in order to identify:

1. The key existing health promotion activities; and
2. The gaps in activities focussing on healthy eating and active lifestyles that target early school leavers.

All potential healthy eating and physical activity related programmes appropriate and acceptable to the target audience were also identified.

Commencement Date: October 2010 **Project Duration:** 12 months **Status:** Completed

3.6. Consumer understanding of food portion sizes

Principal Contractor: Prof Barbara Livingstone, University of Ulster

Collaborator(s): Single supplier

Abstract: This project aims to address the call for urgent and concerted action on the part of health professionals, industry, government departments, workplaces, schools and the general public on the escalating rates of obesity on the Island of Ireland – if the problem is to be attenuated and reversed. However, given that established obesity is largely immutable to remedial action, there is an urgent need to focus attention on those environmental factors, including portion size, that are amenable to preventive action. Simply educating consumers about what foods to eat, or not to eat is clearly not enough; an equally important challenge is to get consumers to appreciate the importance of and act on the quantity of food being consumed. Currently, however, on the island there is a paucity of data on consumer understanding and behaviour around portion size, a gap which needs to be addressed in order to initiate clear and meaningful practical advice about portion sizes that will resonate with consumers.

Commencement Date: October 2010 **Project Duration:** 36 months **Status:** Completed

3.7. Good days and bad days: an investigation of the habits of shoppers when they do or don't buy healthy foods

Principal Contractor: Dr Moira Dean, Queen's University Belfast

Collaborator(s): Prof Patrick Wall, University College Dublin
Dr Monique Raats, University of Surrey
Dr Julie Barnett, Brunel University

Abstract: This project undertook a comprehensive programme of research to better understand the habits of shoppers and to determine when they do and don't buy healthy foods. The research provided an understanding of the reasoning behind consumers' food choices and explored the role of shopping practices that both promote and impede shopping behaviours that lead to healthy choices. The research:

- Identified and classified situational factors influencing shopping decisions and strategies/shopping practices used for healthy shopping
- Involved a qualitative exploration of the ways in which shoppers make choices in relation to purchasing food
- Investigated the relationships between consumers' personal, situational and behavioural factors (barriers and promoters) influencing healthy food shopping
- Made recommendations on strategies and practices for healthy food shopping.

Commencement Date: October 2010 **Project Duration:** 12 months **Status:** Completed

3.8. Family eating out events ‘outside of the home’

Principal Contractor: Prof Barbara Livingstone, University of Ulster

Collaborator(s): Single source

Abstract: This project aimed to carry out a full review of literature, fully referenced, and any other relevant sources to ascertain best practice in providing healthy and nutritious food for children within the catering sector. A quantitative survey to investigate the range of children’s meals available in different types of catering outlets in the Republic of Ireland (Republic of Ireland) and Northern Ireland was carried out by conducting an on-site survey. The catering outlets included dispersion between rural and urban setting, high end and less expensive offerings, local independents and international chains. Attitudes and experiences of parents and guardians of children aged five to 12 years were investigated when faced with the menu options available when eating outside the family home. Key areas of investigation included concerns about nutrition, key motivators in final meal selection, and where ultimate responsibility for choice of menu lies – i.e. parent or child. An investigation into the attitudes of children aged five to 12 years old on food and eating occasions outside the family home was also carried out. This was conducted through a series of friendship pairs, restricted to tightly controlled age bands across both Northern Ireland and the Republic of Ireland, with the objective of understanding how children perceive eating out, and whether nutrition or healthy content is part of the consideration set.

Commencement Date: August 2010 Project Duration: 18 months Status: Completed

3.9. A survey of health professional attitudes to body weight status

Principal Contractor: Dr Anne Moorhead, University of Ulster

Collaborator(s): Single supplier

Abstract: This project conducted a survey to assess the attitudes, current practices/behaviours and knowledge of key health professional groups on an all-island basis, by means of telephone interviews (with GPs) and focus groups (with other health professionals), followed by an online survey to determine the attitudes, current practices and knowledge of the target health professional groups in relation to body weight status. The health professional groups included Public Health Nurses (community; postnatal home and clinic visits and developmental checks); Public Health Nurses (schools); Health Visitors (clinics and community-based); School Nurses; GPs and Practice Nurses (primary care) and Occupational Health Nurses (workplace), all on an all-island basis. A full review of literature and any other relevant sources to explore the role of the target health professionals in tackling obesity through spontaneous intervention in a variety of health promotion settings was carried out. An online study to assess health professionals’ ability to recognise overweight and obesity in adults and children was also undertaken.

Commencement Date: August 2010 Project Duration: 12 months Status: Completed

3.10. Food poverty in four household groups

Principal Contractor: Millward Brown Lansdowne, Dublin

Collaborator(s): Single supplier

Abstract: This research aimed to investigate, using focus groups, the barriers and facilitators to healthy eating among the four most common household groupings that are most at risk of food poverty on the IoI. It investigated the barriers and facilitators to healthy eating among the main 'food/fridge keeper' of these household groupings and investigated the associated commonalities and differences.

Commencement Date: April 2010 Project Duration: Seven months Status: Completed

3.11. Salt levels in ready-to-eat soup purchased in catering establishments

Principal Contractor: Dr Fidelma Kirwan, Eolas International Research Ltd. Little Island, Co. Cork

Collaborator(s): BODYCOTE CONSULTUS, Glanmire Industrial Estate, Co Cork

Abstract: The aim of this survey was to provide a snap shot of the salt content of soup from a range of catering outlets on the island. The survey set out to investigate any differences in the salt content of soups that claim to be 'homemade/freshly prepared' versus other types of soups sold in catering outlets. The results will be used to communicate salt reduction messages to consumers and the food industry.

Commencement Date: April 2010 Project Duration: 15 months Status: Completed

3.12. Children and adolescents drinks consumption

Principal Contractor: Millward Brown IMS, Dublin

Collaborator(s): Single supplier

Abstract: The main objective of this research was to identify knowledge and practice in relation to drinks for children and young people aged 12–18 years within the context of their everyday lives. This research:

1. Provided a clear indication as to the practice around drinks e.g. types of drinks purchased for/by children and young people, types of drinks brought to school, consumed when family and friends are socialising, consumed between meals and with meals;
2. Explored and provided insight into a wide array of drink (including sugar sweetened drinks, smoothies, juices, sports drinks etc.) consumption habits (i.e. where, when) of these particular age cohorts;
3. Provided a deep understanding of the knowledge of parents/guardians and teenagers of the health effects of sugar sweetened drinks, juices, smoothies, carbonated drinks etc. particularly in terms of weight gain, dental health and other variables which were explored in detail (e.g. education, perceptions of 'healthiness,' dangers associated with excessive sugar levels etc.).

Commencement Date: October 2008 Project Duration: Seven weeks Status: Completed

3.13. To develop a validated nutrition evaluation and nutrition information resource for the pre-school setting to promote an improved nutrition environment and food provision in this setting

Principal Contractor: Ms. Corina Glennon Slattery, HSE – Dublin Mid-Leinster

Collaborator(s): Single supplier

Abstract: Establishing good lifestyle habits, including positive attitudes and behaviours around food is one of the key cornerstones to shaping future health. This starts during the pre-school years when children grow rapidly and begin to learn about the environment around them. Providing an environment that supports healthy eating both at home and at school is important.

Early nutrition intervention is a priority for **safe**food. This project aimed to meet this priority through establishing an incentive scheme for full day care pre-schools in an effort to help improve their nutrition practices. The project supports the implementation of the Food and Nutrition Guidelines for Pre-School Services by facilitating pre-schools to promote nutrition standards and food safety through the use of a motivational model.

A simple randomised study was carried out with direct observational data recorded both pre- and post-intervention, using a specifically developed and validated Pre-school Health Promotion Activity Scored Evaluation Form. Post-intervention, self-assessment data were also collected using the same evaluation tool. Ensuring parental involvement was seen as key in this process, as was the inclusion of a representative sample of pre-schools from all socio-economic backgrounds.

Commencement Date: March 2008 Project Duration: 48 months Status: Completed

3.14. A cross-sectional study of an Irish population estimating dietary salt intake, and its association with other lifestyle related risk factors

Principal Contractor: Prof Ivan Perry, University College Cork

Collaborator(s): Single supplier

Abstract: The Irish population consume a high salt diet. Chronic high salt intake is associated with hypertension and other adverse life style factors like obesity and lack of physical exercise. A description of salt intake in the population can be performed by measuring urinary excretion of salt while additional useful information can be acquired using a detailed food questionnaire.

The study sampled two distinct groups of healthy individuals to ensure representation of all age groups within the adult population. The first population was based on a group of subjects of 45 years and older. These subjects are at a higher risk of cardiovascular disease. In this population the study described both the level of salt intake and also the distribution of hypertension and other risk factors in this population such as lipid profile, smoking, physical exertion and glucose intolerance. These subjects used a cluster method of sampling based on the SLAN 06 sampling methods.

A detailed local study in UCC included younger subjects. This measured dietary intake of salt in younger subjects. Core measurement of 24 hour excretion of sodium was made in 700 individuals and 1,600 spot urine samples were analysed.

Commencement Date: December 2007 Project Duration: 16 months Status: Completed

3.15. Analysis of the National Children's Survey

Principal Contractor: Prof Michael Gibney, University College Dublin

Collaborator(s): Prof Albert Flynn, University College Cork

Abstract: The National Children's Food Survey was carried out by the Irish Universities Alliance at University College Dublin and University College Cork. A total of 594 children aged five to 12 years were surveyed between April 2003 and April 2004 of which 293 were boys and 301 were girls.

A seven day weighed food record was kept for each child and information was collected on body measurements (weight, height, body mass and waist circumference), health and lifestyle and habitual physical activity, using accelerometer (objective) data and reported questionnaire data. In addition, information on parental body measurements (weight, height and waist circumference) and health and lifestyle were collected.

Preliminary analysis of the data collected in National Children's Survey has also been carried out. The survey database was further analysed to investigate a number of key issues relating to diet and physical activity, in particular overweight and obesity, in Irish children aged five to 12 years.

The project provided the Health Service Executive and **safefood** with an evidence base in order to guide the development of population health approaches to tackling obesity and overweight among five to 12 year olds. In addition, the research identified dietary strategies for the achievement of key nutritional goals for this age group such as total fat and fatty acids, fruit and vegetables, carbohydrates and fibre intakes. Such information provided an evidence base to support nutrition programmes and communications in these areas. The evidence focused on practical food based information.

Commencement Date: March 2006 **Project Duration:** 24 months **Status:** Completed



4. Consumer Focused Reviews

Consumer focused reviews were initiated in 2005 with the express intention of addressing consumer concerns and providing consumers with the information needed to make informed choices about the food they eat.

4.1. Consumer focused review of men's food behaviour

Abstract: Increasing attention has been paid to the burden of ill-health experienced by men in many Western countries. In Europe and internationally, the Republic of Ireland has been leading the way by developing a national policy for men's health. In most countries around the world, women now have a longer life expectancy than men. Similarly, on the island of Ireland, in spite of recent increases in men's life expectancy, men continue to have higher death rates at all ages and from all leading causes of death. In Northern Ireland, in 2010, men's life expectancy at birth was 77.08 years (81.53 years for women), while in the Republic of Ireland, figures published in 2009 revealed that men's life expectancy at birth was 76.8 years (compared to 81.6 years for women).

Key health issues for men include circulatory diseases, cancers and respiratory diseases. In relation to food and health, obesity has been highlighted as a major concern in relation to men's health. While physiological difference between men and women explain some of the variation in the rate and/or onset of disease (e.g. protective effects of oestrogen in relation to the onset of cardiovascular diseases), other factors, such as socio-cultural influences, which are the main focus of this report, also play an important role. It is acknowledged that men and women experience different influences and motivations with respect to their knowledge and attitudes of and behaviours towards food and health. The purpose of this report is therefore not to compare men with women or to encourage men to model themselves on women in relation to their food and health behaviour. Rather, the goal is to provide recommendations to improve communications, resources, interventions, education and services targeted at boys and men in relation to food.

Publication Date: December 2014 **Status:** Completed

4.2. Consumer focused review of the chicken food chain

Abstract: **safefood** has undertaken a review of the chicken supply chain in 2005 and this was followed by an updated review in 2012 taking into account any changes that could have occurred since the original report was published. This review found that chicken is a key protein source for many consumers on the Island of Ireland with eight out of ten adults now eating chicken every week. Despite a consolidated effort by the industry and the authorities to address the problem of the bacteria naturally present in raw chicken, the advice to consumers remains that they must ensure that chicken is cooked and handled properly to avoid food borne illnesses.

Publication Date: September 2012 **Status:** Completed

4.3. Consumer focused review of food behaviours

Abstract: This Consumer Focused Review focuses on understanding consumer food behaviour. Its primary aim is to inform the research, policies and practices of all those working towards changing consumer food safety and dietary behaviour on the Island of Ireland and to ensure that communication with consumers is both evidence-based and effective. Consumer food safety behaviours are investigated from both a food safety and healthy eating perspective. Both qualitative and quantitative methods were used to identify key influences, barriers and promoters of food safety and healthy eating behaviours. The report provides an overview of the current understanding of the environmental, socio-economic and personal factors that influence food behaviour on the Island of Ireland and the knowledge gaps that exist in this regard. It also investigates what best practice is in communicating to influence behavioural change, especially among vulnerable groups.

Publication Date: June 2012 **Status:** Completed

4.4. Consumer focused review of the finfish food chain

Abstract: **safefood** undertook a review of the finfish supply chain in 2005 and this was followed by an updated review in 2012 taking into account any changes that could have occurred since the original report was published. As with the previous report, this review of the finfish food chain focuses on wild-caught and farmed finfish, and smoked salmon and how these food commodities are caught, processed, sold and consumed on the Island of Ireland. The review outlines the nutritional and health benefits of eating finfish as well as the basic processes by which fish enter the consumer food chain, the controls in place to protect consumers from potential risks and the food hygiene practices that consumers should follow when storing and preparing fish. As part of the review process, **safefood** conducted research into consumer awareness and perception of nutrition and safety issues regarding fish. The findings highlighted key concerns such as freshness, contamination, proper cooking, low fish consumption despite well-documented health benefits, and consumer barriers to purchasing and preparation.

Publication Date: May 2012 **Status:** Completed

4.5. Consumer focused review of where our food comes from

Abstract: Cognisant of the ever-changing food landscape on the Island of Ireland, **safefood** has undertaken a review of externally-produced foods – mainly food imported from the European Union as well as third countries – that is sold on the Island of Ireland. The review provides the most relevant and pertinent information available about the origin of our food. Both quantitative and qualitative research was carried out into consumer perceptions, attitudes and behaviour in relation to the origins of their food. The review revealed a distinct lack of knowledge as to the origin of the majority of their food and a severe lack of confidence in the ‘loopholes’ of the current labelling system. Also, consumers had no real knowledge of the proportion of food imported or reasons why food is imported. Consumers felt locally or nationally grown products were more authentic and of higher quality. However, despite these concerns, ultimately they were happy to pay the cheaper prices and avail of better choice when it came to imported goods, especially if this matched the increased desire to eat healthily and ethically.

Publication Date: July 2009 **Status:** Completed

4.6. Consumer focused review of the pork supply chain

Abstract: This review outlines the pork and pork product supply chain on the Island of Ireland. The basic processes by which pork and pork products enter the consumer food chain are described as well as the controls in place to protect consumers from potential risks. The nutritional and health benefits and risks of consuming pork and pork products are discussed. The review covers raw, unprocessed pork products (e.g. pork loin, pork chops and pork roast), raw, processed pork products (e.g. bacon such as sliced bacon or ‘rashers’), ham and sausages, and processed/heat-treated pork products (e.g. cooked ham).

Publication Date: November 2008 **Status:** Completed

4.7. Consumer focused review of the milk supply chain

Abstract: **safefood** has undertaken a review of the milk supply chain in order to describe how milk is produced, processed, sold and consumed on the Island of Ireland. The review describes the milk supply chain on the island and the basic processes by which drinking milk enters the consumer food chain. It also described the controls that are in place to protect consumers from potential risks; the nutritional and health benefits of drinking milk. The review found that consumers drank milk because it was a healthy food, high in calcium, and therefore good for bone development. The habit of drinking milk started for most consumers in childhood and, for some, this continued into adulthood. Consumers who did not drink milk disliked the taste and texture. Some people avoided milk due to perceived allergies. Consumers had a few minor concerns about milk. These included the long shelf-life, the presence of antibiotics and hormones and the risk of contracting tuberculosis. To address their concerns, consumers relied on use-by dates, country of origin and brand names to reassure them.

Publication Date: April 2008 **Status:** Completed

4.8. Consumer focused review of the beef food chain

Abstract: **safefood** research shows that three out of four people on the Island of Ireland eat beef regularly. The main reason given is that it tastes good and is enjoyable. The review outlines the beef industry on the island, the basic processes by which both domestic and imported beef enters the consumer food chain, and the controls in place to protect consumers from potential risks. It covers the food hygiene practices that consumers should follow when storing, preparing and cooking beef, and examines the nutritional and health benefits of eating beef.

Publication Date: February 2008 **Status:** Completed

4.9. Consumer focused review of the fruit and vegetable food chain

Abstract: During 2006, **safefood** undertook a review of how fruit and vegetables are grown, imported, sold and consumed on the IoI. This review focuses on ready-to-eat fresh fruit and vegetables, whether whole or prepared, which are eaten raw. The review outlines the nutritional and health benefits of eating fruit and vegetables as well as the basic processes by which fruit and vegetables enter the consumer food chain, the controls in place to protect consumers from potential risks, and the food hygiene practices that consumers should follow when buying, storing and eating fruit and vegetables.

Publication Date: January 2007 **Status:** Completed

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