Universal ethical code for scientists

Rigour, honesty and integrity

- Act with skill and care in all scientific work. Maintain up to date skills and assist their development in others.
- Take steps to prevent corrupt practices and professional misconduct. Declare conflicts of interest.
- Be alert to the ways in which research derives from and affects the work of other people, and respect the rights and reputations of others.

Respect for life, the law and the public good

- Ensure that your work is lawful and justified.
- Minimise and justify any adverse effect your work may have on people, animals and the natural environment.

Responsible communication: listening and informing

- Seek to discuss the issues that science raises for society. Listen to the aspirations and concerns of others.
- Do not knowingly mislead, or allow others to be misled, about scientific matters. Present and review scientific evidence, theory or interpretation honestly and accurately.

For more information on the Code, see: www.bis.gov.uk/Policies/science/science-and-society/public-engagement/ethical-code
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Welcome to my fourth Annual Report, covering the period 1 April 2009 to 31 March 2010. As in previous years the report focuses on specific areas of the Food Standards Agency’s work over the last year and highlights our progress in areas where the foods we eat can impact on public health. Science is at the heart of the Agency’s work and this is reflected in our development of policies and advice.

Chapter 1 provides an update on foodborne disease trends and our work carried out to identify the source of Campylobacter contamination across the food chain and the development of a new Campylobacter Risk Management Programme, which will encompass a range of partnerships and projects targeted at appropriate points across the food chain focusing on the reduction of Campylobacter in chicken. There is an update on the Agency’s campaign to raise awareness of the recent rise of food poisoning in the over-60s due to Listeria and the measures that can be taken to prevent it. This chapter also provides an update on our recent work with other government departments to help tackle obesity and reduce salt intake.

Our science spend over the last year is considered in Chapter 2 and there are some highlights of our research, such as the work aimed at improving our understanding of the causes, spread and control of Campylobacter infection and our food authenticity work. There are also examples of how we develop policy based on evidence and independent scientific advice, and it provides details of the review of organic food.

Chapter 3 covers our science governance activities. It also provides details of some of the work of our scientific advisory committees (SACs) and it describes our efforts to ensure that we continue to receive high standards of independent scientific advice. I place great importance in the development of in-house expertise and you can find out more about the progress made in provision of a continuing professional development scheme for our generalist scientists and about the range of analytical skills of some of our specialist scientists.
A key area where we have made progress over the past year is prioritisation of partnership working and using multidisciplinary approaches. I am pleased to report on a number of the Agency’s partnerships such as a cross-funder approach to control *Campylobacter* and the collaborative work on food allergy in Chapter 3. We are increasingly working with other funders (both in the UK and internationally) to co-fund work, so that we maximise the impact of our spend.

The fourth chapter considers emerging risks, such as climate change and nanotechnology. The report, and the work described in it, is a collective effort by all of the scientists and other staff in the Agency. The online report is interactive which will allow you to follow up on topics covered, find out more about our research work and other scientific work. Annexe A provides links to all of the Agency’s research programmes. For more about the Agency’s science work, you can visit [food.gov.uk/science/](http://food.gov.uk/science/) or my blog at [food.gov.uk/scienceblog](http://food.gov.uk/scienceblog)

I hope you enjoy this year’s Chief Scientist Annual Report. If you have any comments on the report or any aspects of the Agency’s work, you can email me at infocentre@foodstandards.gsi.gov.uk or send me a message via my blog.

Andrew Wadge  
Chief Scientist and Director of Food Safety  
Food Standards Agency  
September 2010
Throughout the year the aim of the Agency’s work has been to ensure that the food supply is both safe and healthy for all. To help determine our strategic priorities, we monitor trends and analyse risks and controls across the food supply chain so that we can increase our understanding about the public health impacts of food-related issues.

In this chapter we will consider people’s food-related concerns, provide an update on our work in partnership with others in key areas, such as foodborne illness, and details of the science-related work aimed at helping people decide what changes they need to make to support a healthy diet.

**Consumer attitudes and concerns**

The Agency’s Public Attitudes Tracker\(^1\) survey is conducted on a quarterly basis and monitors changes in consumer attitudes towards the Agency and food-related issues. The survey covers three main areas:

- awareness of the FSA
- food-related concerns
- confidence in the current measures to protect consumer health

Data from the survey, which has been in place since March 2001, shows that public confidence in all organisations involved in protecting health with regards to food safety has increased over that time (from 39% in March 2001 to 59% in March 2010), as has confidence in the Agency specifically (from 40% in March 2001 to 63% in March 2010). Key results from the March 2010 Public Attitudes Tracker survey\(^2\) are shown in the box.
Public Attitudes Tracker survey, March 2010

• There was a statistically significant decrease in concern about food safety issues in the last quarter. 59% of respondents were either quite or very concerned about food safety issues in March 2010 compared to 70% in December 2009 and 73% in 2001.

• The main food issues of total concern* were the amount of salt in food (44%), food poisoning (43%) and the amount of fat in food (41%).

• Concern about issues to do with healthy eating are shown in figure 1.

* Total concern is spontaneous concern plus prompted concern

• Total concern about BSE has declined, from 57% in 2001 to 16% in March 2010.

• Total concern about genetically modified food has declined, from 43% in 2001 to 19% in March 2010.

• Consumer awareness of the hygiene standards of establishments that sell food has been monitored since September 2009. In March 2010, 83% of respondents reported being aware of the hygiene standards of places where they eat out or buy food from. This is the same figure as reported in the previous two quarters.

• Of this 83%, the main ways respondents reported being aware of hygiene standards in eating establishments were from the general appearance of premises (73%), appearance of staff (59%) and reputation of the establishment (50%).
Foodborne illness: current issues

Foodborne illness is caused by contamination of food by microorganisms or the toxins they produce. When all UK cases of foodborne illness caused by bacteria, viruses, parasites and other ‘unknown’ agents are added together, annual estimates for foodborne illness in the UK are about one million cases, 20,000 hospital admissions and 500 deaths each year.

Since the Agency’s inception in 2000, the reduction of foodborne disease has been one of our key objectives in ensuring food safety. The Foodborne Disease Strategy (FDS) was established in 2001³ to achieve this and a considerable reduction in incidence of foodborne disease had been achieved by 2005. However, there has not been a significant change in the level of UK foodborne disease since 2005 and the cost and burden due to foodborne disease in the UK remains unacceptably high. Much of the current burden could be avoided or prevented and there remains scope for further action across the food chain to significantly reduce the level of disease and its impact on public health.

Monitoring progress

The number of reported laboratory-confirmed cases and reported cases of illness caused by pathogenic organisms that are commonly associated with food poisoning is the most robust way to monitor trends in foodborne disease over time.

The number of reported laboratory-confirmed cases of foodborne illness is known to be lower than the actual number that occurs due to under-reporting of cases. To take account of this under-reporting, and to provide a measure of the severity of disease caused, the Health Protection Agency (HPA) calculates annual estimates of the actual number of cases of food poisoning in England and Wales.

The methodology for these estimates makes use of information about outbreaks and special studies, such as the large Infectious Intestinal Disease (IID) study in the community that was conducted in the mid-1990s.⁴ As the IID study was only carried out in England, current estimates can only reliably be calculated for England and for Wales, because the surveillance systems are comparable, but cannot be extended to the other UK countries where reporting systems differ.

A second study of IID⁵, which aims to update the data from which the burden of disease in the community is estimated, has been carried out across the UK and is expected to report its findings later in 2010.

Figures 2 and 3 illustrate the difference in the cause of estimated cases of foodborne disease in the community in 2008 in England and Wales caused by the five major pathogens monitored by the Agency: *Salmonella*, *Campylobacter*, *Listeria monocytogenes*, *E. coli* O157 and *Clostridium perfringens* and the estimated deaths from these pathogens.*

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* At the time of writing the 2009 figures were not available. These will not be calculated until updated data on reported cases are available later in 2010.
Although *Campylobacter* remains the most common cause of foodborne illness in England and Wales, *Listeria monocytogenes* is responsible for the highest number of deaths. There were an estimated 321,200 cases of *Campylobacter* infection in England and Wales in 2008, with 15,100 hospitalisations and 80 deaths compared with an estimated 350 cases of *Listeria monocytogenes* infection and hospitalisations and nearly 130 deaths.

The Agency estimates the cost of foodborne illness in England and Wales annually, as a way of measuring the resource and welfare losses attributable to foodborne pathogens. The overall estimated annual cost of foodborne illness in England and Wales has remained below the updated baseline level* of £1.9 billion in 2000 (the first year of the Agency’s work) and has remained fairly stable since 2005 at around £1.5 billion.

* To compensate for inflation, costs have been based on 2008 quarter 1 prices, to allow for comparison to be made between years.
The reduction of foodborne disease remains a priority in ensuring that food produced and sold in the UK is safe to eat. A revised foodborne disease strategy for 2010 to 2015 is expected to be published in 2010 to facilitate delivery of these reductions. It is likely that we will not continue to monitor for cases of *Clostridium perfringens*, as it is poorly detected by routine surveillance and provides little valuable information about trends in human illness (see figure 5). When considering estimates of infectious intestinal disease (IID) in the community, norovirus is shown to cause a significant number of cases in the UK. We therefore intend to address this and investigate the contribution of the food chain as a source of norovirus infection.

### Trends

Provisional data† indicate that in the UK in 2009 there were a total of 62,138 laboratory-confirmed cases of the five key bacterial foodborne pathogens monitored by the Agency. These were cases thought to have been acquired in the UK and not associated with foreign travel. The UK total for 2009 represents an increase of 13.2% UK-acquired cases compared with 2008.

Figure 4 shows the number of reported cases of foodborne illness caused by the five key pathogens on a population basis (cases per 100,000 of the population) for the UK as a whole and for each of the individual UK countries.

**Figure 4: UK incidence rates for key FSA foodborne pathogens 2000 to 2009**

† Figures were provided as provisional in March 2010 and may be subject to further change.
Although overall incidence appears to be higher in Scotland and lower in Northern Ireland, this difference is thought to be due to differences in surveillance and reporting systems in those countries rather than actual differences in incidence. Nonetheless, these data do allow trends with time to be compared between countries.

Figure 5 shows the change in UK incidence of the same five pathogens indexed against the incidence for the year 2000, which demonstrates how the incidence rates have changed for each pathogen since 2000.

**Figure 5: UK incidence of key foodborne pathogens 2000 to 2009 (indexed to incidence in 2000)**

The trends for individual pathogens are considered in more detail below.* It should be noted that all 2009 data presented in the report are provisional in nature and could be subject to change with time.

**Campylobacter**

The incidence of *Campylobacter* in the UK was largely stable between 2000 and 2008, with the exception of a decrease in 2002. However, provisional data for 2009 indicate a marked increase in cases. Across the UK, there were 52,529 laboratory-confirmed cases of *Campylobacter* in 2009 compared with 44,842 in 2008, an increase of 17.1%. An increase was seen in all UK countries, with the largest increase of almost 31% in Scotland, 18% in Northern Ireland and 15% in England and in Wales.

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* Because the IID study was only carried out in England, current estimates of cases in the community can only reliably be calculated for England and Wales, whose surveillance systems are comparable, and not extended to the other UK countries where reporting systems differ.
It is unclear whether this marked increase in 2009 is due to a true increase in incidence, an increase in reporting, or a combination of the two. This increase will be examined further through cross-Government groups such as the Epidemiology of Foodborne Infections Group (EFIG), whose opinions and advice will inform future monitoring and work to control this organism.

It was estimated that there were just over 320,000 cases of illness caused by *Campylobacter* in the community in England and Wales in 2008.

**Salmonella**

There were 8,023 laboratory-confirmed cases of *Salmonella* in 2009 compared with 8,542 in 2008, a decrease of 6%. This decline was seen in all UK countries.

Although the UK incidence (reported cases/100,000 population) has shown some fluctuation since 2000, there has been a gradual but steady downward trend. The successful control on *Salmonella* in eggs and poultry is considered to be responsible for much of this welcome decline in human illness and is testimony to the efforts of the UK poultry industry.

It was estimated that there were fewer than 27,000 cases of illness caused by *Salmonella* in the community in England and Wales in 2008.

**E. coli O157**

There were 1,159 laboratory-confirmed UK cases of *E. coli O157* in 2009 compared with 1,096 in 2008, an increase of nearly 6%. The incidence of cases caused by this pathogen includes a number of cases that were not food related, such as outbreaks of *E. coli O157*, at open farms and zoos during 2009. Overall, and taking these cases into account, there appears to be no change to the underlying consistent level of foodborne cases.

Cases of *E. coli O157* are reported effectively through routine surveillance systems. Overall it was estimated that there were about 1,050 cases of illness caused by *E. coli O157* in the community in England and Wales in 2008.

**Listeria monocytogenes**

Although the UK incidence of *Listeria monocytogenes* has shown some fluctuation since 2000, there has been a marked increase over that period, and the incidence is now twice what it was in 2000.

There were 226 laboratory-confirmed UK cases in 2009 compared with 205 cases in 2008, an increase of 10.2%.

Although the number of cases each year is low compared with other pathogens, the number of cases that require hospital treatment is very high (all cases are thought to be hospitalised) and around a third of all cases result in death. For these reasons *Listeria monocytogenes* is considered to be a significant foodborne pathogen and its effective control or prevention could result in a significant reduction in the burden of UK foodborne disease.
It was estimated that there were around 360 cases of illness caused by *Listeria monocytogenes* in the community in England and Wales in 2008.

*Clostridium perfringens*

The number of laboratory-confirmed cases each year is low (202 in 2008, 201 in 2009) and small changes in reported cases result in a large apparent change in incidence. This organism is poorly detected by routine surveillance and so surveillance provides little valuable information about trends in human illness. Specialist tests are required to detect *Clostridium perfringens* and its toxins. This together with the low annual number of reported cases means that reported cases or estimated cases in the community do not provide reliable monitoring information.

A closer look at *Campylobacter*

In this year’s Annual report, we are focusing on *Campylobacter* (see the box below). One of the Agency’s main strategic priorities is to reduce foodborne disease using a targeted approach, and tackling *Campylobacter* in chicken is a priority.

*Campylobacter*

- *Campylobacter* is the most commonly reported bacterial cause of gastrointestinal infection in the UK. The main symptoms are diarrhoea, which can be severe and bloody, with abdominal cramps and malaise.
- *Campylobacter* is found mainly in poultry, red meat, unpasteurised milk and untreated water.
- There is strong evidence that chicken is the most common source of human foodborne illness in the UK each year.
- Although *Campylobacter* does not grow in food, it spreads easily, for example it can spread from a piece of raw chicken via hands, utensils or surfaces, onto food that is ready to eat and cause food poisoning.
- Simple measures can be taken to avoid foodborne illness from *Campylobacter*, including avoiding spread between raw and cooked foods, washing hands, surfaces and utensils after handling raw meat, and using different chopping boards for raw and ready-to-eat food. Raw meat should always be kept separate from ready-to-eat food and it should be cooked properly to kill any bacteria that might be present.

There has been a change in the age structure of human campylobacteriosis with the incidence of disease increasing in older people. The Advisory Committee on the
Microbiological Safety of Food (ACMSF) considered the findings of investigations into this changing age pattern at its meetings in March\(^6\) and September 2009\(^7\) (see the box).

The changing age structure of campylobacteriosis

Analysis of data from a case-control study conducted by the Health Protection Agency (HPA) showed a marked change in the rates of infection with *Campylobacter* in different age groups, with the emergence of older people as the group at greatest risk. In simplest terms, the incidence of campylobacteriosis in people aged 60 years and over increased more than threefold over the period 1990 to 2007. This pattern, which was independent of gender, season and geography, was not observed for non-typhoidal salmonellosis or cryptosporidiosis, suggesting that it was unlikely to be an artefact. To investigate risk factors associated with this increase, the HPA further analysed data collected by means of a self-administered questionnaire from a case-control study carried out in five Health Protection Units (HPUs) in England involving adults with laboratory-confirmed *Campylobacter* spp. infection. Controls were frequency matched to cases on the basis of HPU, age, sex and month of report. The data included basic demographic and socio-economic information, clinical details, duration and severity of symptoms, hospitalisation and exposure to risk factors. The risk factors were grouped under eight broad categories: health details; occupational exposure; pet ownership; water; recreational exposure; food consumption; food preparation; and household details.

The various possible risk factors identified as relating to this increase in disease in the over 60s related to:

- health factors (for example, one hypothesis is that taking acid suppression medication may increase risk)
- food safety practices in the home
- whether or not the person lives alone

Dissemination of FSA-funded research on *Campylobacter*

The findings of three Agency-funded research projects on *Campylobacter* were presented at a workshop held in Edinburgh in June 2009 and recommendations for future Agency work were discussed.\(^8\) The results support the view that the majority of cases of *Campylobacter* infection in Scotland are attributable to retail chicken. Further details of these projects can be found in Chapter 2.
Prevalence of Campylobacter contamination of chicken

In October 2009, the Agency published the results of a survey that was designed to determine the prevalence of Campylobacter contamination in chicken. The survey was conducted from May 2007 to September 2008, and tested chicken on sale in the UK for the presence Campylobacter and it also tested for the presence of Salmonella (see the box).

Survey of Campylobacter contamination of fresh chicken at retail sale in the UK

3,274 samples of fresh chicken were tested for Campylobacter and Salmonella. Samples included UK and non-UK produced, chilled and frozen, whole and portioned chicken on retail sale in the UK. The overall prevalence was reported based on the results from 927 samples tested using both a presence and absence and enumeration method for Campylobacter. By combining the positive number of samples determined using each of these methods, it reduces the number of false negative results and therefore provides a more accurate measure of prevalence. The results indicated:

- the prevalence of Campylobacter in chicken at retail in the UK was 65%, based on the results from both methods combined, for the 927 samples tested
- the prevalence of Campylobacter in whole chicken of UK-origin was 76% based on 416 whole UK-origin chicken samples tested using both methods
- the prevalence of Campylobacter was higher in chilled chicken than frozen
- there was an increase in the frequency of antimicrobial resistance including quinolone resistance, in Campylobacter isolates compared to that observed in the 2001 survey
- results indicated that Salmonella prevalence remained low, at around 6% of samples tested

An EFSA survey published in March 2010 of Campylobacter across the EU reported that, on average, the bacterium was found in the intestines of 71% of EU broiler batches, indicating that they were already infected before slaughter, and on 76% of broiler carcasses, which suggests some further contamination during slaughtering. The UK had the tenth highest prevalence of Campylobacter contaminated broiler batches (75%) and the sixth highest contaminated broiler carcasses (86%).
What action is the Agency taking?

Further work is already underway in a number of areas with regard to achieving a reduction of *Campylobacter* in chicken and a resulting reduction in human cases.

A joint Government-Industry Working Group on *Campylobacter* was established in August 2009 to identify practical and effective interventions in the control of *Campylobacter*. The Working Group will play a key role in taking forward the interventions identified at the 'International meeting on *Campylobacter* reduction in chicken' that was held in March 2010, and it was consulted on the joint Strategy for *Campylobacter* Research (see sections below).

At producer level, the Agency has worked with industry to develop and implement improved biosecurity measures to limit *Campylobacter* colonisation of chickens. Further research will be undertaken to develop an understanding of critical points in the growing process that may be targeted by producers to limit colonisation and spread of *Campylobacter* in chickens.

At the processor level a key intervention is implementation of best practice hygiene in processing plants. We are working with the British Poultry Council (BPC) to develop a slaughterhouse hygiene tool to allow processors to measure hygiene levels in their plants and change practices to improve it. This tool is currently being trialled by the majority of large poultry processors.

**Joint *Campylobacter* research strategy**

The Agency, the Biotechnology and Biological Sciences Research Council (BBSRC) and Defra, hosted a joint *Campylobacter* research strategy workshop in October 2009. Academic researchers and representatives of the poultry industry explored and prioritised which activities could help in the development of ways to control *Campylobacter* in the food chain, and their priority for the respective research funders (see the box).
**Campylobacter research strategy workshop**

The following key areas were identified, where research could have the greatest impact on the overall targets.

For an increased understanding of what happens ‘in real life’ and what interventions will really make a difference:

- high quality baseline surveys to help understand the efficacy of interventions when these are introduced
- greater knowledge of what interventions actually work, including trialling of large scale interventions
- studies to compare the different real-life on-farm and in-factory practices that appear to have different Campylobacter occurrence rates
- studies to develop a better understanding of the effect of feed regimes, feed additives, organic acids etc. on the occurrence of Campylobacter in flocks
- studies investigating potential interventions during transportation and slaughter house or factory practices
- studies on human behaviour:
  - on-farm and in production processes
  - domestic and commercial preparation and cooking practices

For development of an understanding of the whole system from the bacterium to the infection of the bird and transmission to the human:

- predictive modelling of the system
- improved understanding of how the bacterium survives in the environment
- increasing understanding of colonisation in the chicken, including immune response
- increased understanding of the total microbiota of the chicken gut, including the effect of welfare, feed, other factors on the microbiota, and Campylobacter in particular

A focus on significant routes to reducing the levels of Campylobacter in chickens:

- breeding chickens that are genetically resistant to Campylobacter
- development of a vaccine(s)
- development of bacteriophage, bacteriocins and other new anti-microbials

The need for some particular tools:

- the development of a rapid, on-farm test for Campylobacter
- a strain bank to aid understanding of the genetic diversity of the bacterium
Following on from the workshop, the Agency has worked in partnership with Defra and the BBSRC to develop a joint research strategy for *Campylobacter*. Scottish Government and the Department for Agriculture and Rural Development in Northern Ireland have also endorsed the strategy. We will be looking to engage with other potential partners in the future.\(^\text{12}\) (See Chapter 3 for other developments on partnership working.)

*Campylobacter* risk management programme

The Agency is working with the entire supply chain in the poultry industry to identify interventions that work in each sector to reduce *Campylobacter* prevalence in chicken flocks and on carcasses.\(^\text{13}\) The Agency’s Chief Executive has written to the major food retailers in the UK to highlight the issue of *Campylobacter* in chicken, outlining the results of the survey and to request their help in tackling this problem.\(^\text{14}\)

The Agency organised and hosted a major international meeting on *Campylobacter* reduction in chickens in March 2010, which presented experiences from Europe, USA, Canada, Australia and New Zealand (see the box).\(^\text{15}\)

### International meeting on *Campylobacter* in chicken

International regulators and experts (including representatives from the European Commission and EFSA) from 13 countries, representatives from the UK poultry industry and retailers, as well as scientific experts and representatives from the UK Government (FSA and Defra) attended the meeting.

There were presentations on *Campylobacter* levels across Europe, an outline of the UK poultry industry, and evidence of interventions that had been successful in other countries.

A range of interventions at farm, slaughterhouse and retail, were identified that could be used by the UK industry. These included:

- specific biosecurity measures on-farm, such as use of physical hygiene barriers, changing boots rather than using boot dips and fitting fly screens to poultry sheds
- optimisation of the evisceration process and potential use of treatments to decrease carcass contamination with *Campylobacter* within the slaughterhouse
- retail interventions, such as leak-proof and modified atmosphere packaging

The important role that performance targets (both mandatory and voluntary) and incentives could have in improving the situation was discussed.

Deciding which of these options are worthy of further consideration will need to take account not only of scientific and technical issues, but also the influence of global markets as well as the relevant legislative environments. For example, some measures,
such as the use of chlorinated water or other chemical treatments, are not currently permitted in the European Union.

The most promising interventions will also be considered by the Joint Government-Industry Working Group on Campylobacter. By the end of 2010 we aim to have set a target for the reduction in Campylobacter in chicken to be achieved by April 2015.

While we are determined to decrease the levels of Campylobacter in raw chicken on sale in the UK, we will continue to engage with consumers to highlight the measures they can take to protect themselves. For example, Food Safety Week in June 2010 focused on actions that are most effective in preventing Campylobacter infections, through cooking food thoroughly and avoiding cross-contamination.

**Update on Listeria**

In last year’s Annual Report we focused on the pathogen *Listeria monocytogenes*, a type of food poisoning bacteria that can live and grow in a wide range of food – chilled ready-to-eat foods in particular – for example pâté, cooked sliced meats, certain soft cheeses and smoked fish.

The incidence of *Listeria monocytogenes* food poisoning is almost double what it was in 2000 and this has occurred predominantly in people aged over 60. As part of the annual Food Safety Week held in June 2009, the Agency issued advice to older people about the life-threatening danger of Listeria food poisoning and the simple steps that can be taken to avoid it.

The Agency worked with GP surgeries, pharmacies and a range of community groups across the UK, specifically in areas with large populations of older people, to advise the over 60s to take care with chilled food. The advice was not to use food past its ‘use by’ date, to make sure their fridges are between 0°C and 5°C, and to follow storage instructions on food labels.

These food safety messages were targeted directly at older people through a poster and leaflet campaign, and advice was also handed out on millions of pharmacy paper bags used for dispensing prescriptions.

The Advisory Committee on the Microbiological Safety of Food’s (ACMSF) report on the increase in listeriosis in older people was published in September 2009 (see the box).
The Advisory Committee on the Microbiological Safety of Food (ACMSF) report on listeriosis

Four hypotheses were considered to try to establish the cause of the change in epidemiology in the over 60s age group.

Work was carried out within a risk framework to assess hazard characterisation, identification and exposure. Aspects of risk management were also considered, including legislative limits, food industry controls and consumer advice.

The ACMSF recommended:

- pan-European surveillance, epidemiological and microbiological investigations
- studies to investigate differences in virulence of *Listeria monocytogenes*
- maintaining targeted active surveillance for *Listeria* spp. in foods is important to inform control of this organism
- information on food consumption patterns of the over 60s (including vulnerable groups) is needed to inform approaches to risk management
- communicating general food safety advice to the over 60s, as well as to those involved in their care and preparation of their food
- the Agency’s independent Social Science Research Committee (SSRC) should consider food storage and handling practices of older people (see the box)
- any future advice to industry and enforcement authorities should reiterate the importance of temperature and shelf life control, hygiene/cleaning and formulation of food in preventing contamination or limiting the growth of *Listeria monocytogenes* in foods
The Social Science Research Committee (SSRC) Working Group on *Listeria monocytogenes* advised on possible future actions (see the box).

**The Social Science Research Committee’s (SSRC) investigation into the increase in listeriosis in the elderly**

A preliminary literature review and interviews with relevant experts indicated that across the areas of food and ageing, research into lifestyle changes and food safety practices, was fragmented and limited, particularly with respect to people over 60.

Options for further work included:

- a comprehensive review of a wider range of literature
- conducting primary research

The latter could include a specially designed survey linked into the new Food Issues Survey (FIS) to provide baseline data on a range of food safety knowledge and practices in elderly people.

The ACMSF noted the need to focus on people’s actual behaviour in the way they handled food rather than their opinions on what they thought they should be doing. It recognised the importance of obtaining information on sub-groups within the over 60 age group and noted that this data would be valuable in considering factors for campylobacteriosis as well. The difficulty in obtaining information from elderly people who were ill was acknowledged.

The ACMSF supported cross-disciplinary research, rather than a further literature search, to establish baseline data using evaluative methods linked to the new FIS. This was considered the best way to improve the Agency’s understanding of people’s food safety knowledge and behaviour in the home.

The Agency is continuing to extend and refine its work to control *Listeria monocytogenes*. During 2010 we will develop a risk management programme that aims to reduce listeriosis, particularly within high-risk groups, such as people over 60. Central to the programme will be development of a targeted and effective communication strategy to ensure consumers are aware of the risk associated with *Listeria* and know how to avoid it. In order to help us to target our messages more effectively, we will continue to work with our partners in health protection to investigate the reasons for the increase in disease in high risk groups. We will also continue to support work to decrease *Listeria* contamination in the food chain through the development of risk assessment tools.
Food safety update

Improving food hygiene standards
The Agency is developing a national food hygiene rating scheme (previously known as ‘scores on the doors’) to provide consumers with information about the hygiene standards found by local authority officers when they undertake inspections in food businesses. The aim is to help consumers make informed choices about where they buy and eat food and, through this, encourage businesses to improve standards of food hygiene.

In 2010, more than 200 local authorities across the UK operate a variety of food hygiene rating schemes, which vary in their design and the way that they are operated. In order to avoid further proliferation of these local schemes, the Agency is working towards a national approach that will ensure consistency for businesses and clarity for consumers (see the box).

A national food hygiene rating scheme
Restaurants, takeaways, cafés, sandwich shops, pubs, hotels, supermarkets and other retail food outlets, as well as any other business where consumers can eat or buy food, will be included. The rating given to each business will reflect the level of compliance with food hygiene legislation found at the time of inspection. There are six different ratings – the top rating means a very good level of compliance. These ratings will be made available via an online search facility, and businesses will be encouraged to display them at their premises.

A UK-wide Steering Group (with consumer, food industry and local authority representatives) was established in March 2009 to provide advice and guidance to the Agency on the development of the national scheme. The main elements of the underpinning framework for the scheme include: the scope (which types of businesses will be given a rating); the method of calculating the ratings; the safeguards needed to ensure businesses are treated fairly; and the measures for ensuring that local authorities operate the scheme consistently.

The symbols and descriptors that will be used to represent each of the ratings to consumers, and the branding that will give the scheme its identity will be informed by the findings of recently completed consumer research.

The design and functionality of the hygiene ratings online search facility is being informed by research carried out in the summer of 2009 with consumers and small food businesses. It is planned that the system will go live in mid-September with the scheme being rolled out in partnership with local authorities in England, Wales and Northern Ireland from autumn 2010.
A two-tier scheme – the Food Hygiene Information Scheme – is being implemented in Scotland. This assesses compliance with food hygiene legislation across the same scope of establishments as the six-tier scheme. The Food Hygiene Information Scheme was piloted in Scotland from 2006 and 26 of Scotland’s 32 local authorities have since indicated their intention to implement the scheme. Ten had launched the scheme in their areas by 1 April 2010 and a further six have indicated their intention to do so in October. The Agency’s online search facility will integrate information from both schemes.

Other initiatives to improve hygiene standards have also been undertaken. In January 2010 the Agency launched a UK-wide campaign, to raise awareness among food businesses about tools the Agency has available to help them comply with food hygiene law. These include ‘Safer Food, Better Business’ (for use in England and Wales), ‘CookSafe’ and ‘RetailSafe’ (for use in Scotland), and ‘Safe Catering’ (for use in Northern Ireland). These tools provide innovative and practical approaches to food safety management, particularly in small businesses.

The campaign – which included posters, adverts on the radio and in trade publications and promotion online – targeted catering businesses that supply food direct to consumers. The aim was to help to support the work that local authorities do to ensure that food businesses comply with food law. It should also help businesses achieve higher ratings in the national food hygiene rating scheme.
Surveys

Surveys of contaminants in food are carried out to aid risk assessments, monitor trends and judge the effectiveness of regulation. For details of surveys reported over the past year, see the box.

Food surveys reported during 2009/10

- Survey of fluorinated chemicals in food, including perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFOA) and related chemicals. PFOS salts are a component of fire-fighting foam concentrates and PFOA is primarily used as an emulsifier in industrial applications, for example in the production of fluoropolymers such as polytetrafluoroethylene (PTFE). PFOS and PFOA are used more than the related chemicals. The manufacture and use of PFOS salts is gradually being phased out because of concerns that they might be harmful to the environment. In 2009, PFOS was added to the list of chemicals of concern under the Stockholm Convention. However, the results of this survey do not raise any concern for human health from dietary exposure to these chemicals.25

- Levels of total and inorganic arsenic in rice drinks. This survey was part of a larger programme examining rice and rice products, which are known to have higher levels of naturally occurring inorganic arsenic than other foodstuffs. The levels of arsenic found indicate that they have remained fairly consistent over time.26

- The second year of a three-year rolling programme to measure the levels of the process contaminants – acrylamide, furan, ethyl carbamate and 3-monochloropropane-1,2-diol (3-MCPD), in a range of UK retail foodstuffs (see section below).

Process contaminants

Process contaminants are chemical substances produced naturally in food during food manufacturing, cooking, packaging and other processing activities. They are absent in the raw foods and are only formed when components in food undergo chemical changes during processing. Processing methods may include fermentation, acid hydrolysis, smoking and drying as well as cooking (grilling, frying and barbecuing) both by manufacturers and at home.

The process contaminants survey enables the Agency to monitor levels of a range of process contaminants in foodstuffs that are commonly consumed in the UK. This is important as consumer demand for processed and convenience foods has increased over the last 20 years, as shown in Defra’s report on food and drink purchased in the UK, although the graph in figure 6 suggests that trends might have started to level off.
Figure 6: Average quantities of ready meals and pizzas purchased per person per week*  

![Graph showing average quantities of ready meals and pizzas purchased per person per week from 1990 to 2008.](image)

Source: Defra Family Food (2008)*27  

*The data for ready meals include household purchases of meat-based ready meals and convenience meat products only and the data for pizza include shop-bought and home delivery pizza only. The financial year (1 April – 31 March) is reported between 2001-2006

**Expert advice on process contaminants**28

3-Monochloropropane-1,2-diol (3-MCPD) is formed by acid hydrolysis during the production of hydrolysed vegetable protein (HVP) and during the thermal processing of certain foods. Expert committees of independent scientists have set a safety guideline or ‘tolerable daily intake’ (TDI) for 3-MCPD of 0.02 mg/kg bw/day in HVP and soy sauce based on a 40% dry matter, below which there is not considered to be a risk of cancer or other toxicological effects.

Acrylamide, furan and ethyl carbamate have the potential to cause cancer even at very low levels of exposure and experts advise that exposure to these process contaminants should be as low as reasonably practicable.

Acrylamide is produced naturally when starchy foods are cooked at high temperatures. Furan might be produced from the reaction of ascorbic acid (vitamin C) and furfural, and also from the breakdown of amino acids or from oxidation of polyunsaturated fatty acids at elevated temperatures as employed during the canning/jarring process.

Ethyl carbamate is produced naturally during food processing, particularly in some distilled spirit drinks and fermented foods. It is considered as ‘possibly carcinogenic to humans’ by the International Agency for Research on Cancer (IARC) but the European Food Safety Authority (EFSA) has concluded that estimates of dietary exposure from food, excluding alcoholic beverages indicate a low concern for human health.
Survey of process contaminants in retail food

The survey was conducted in response to two European Commission recommendations for pan-European activity on the process contaminants acrylamide and furan.

The Agency took the opportunity to expand the survey to also include the process contaminants 3-MCPD and ethyl carbamate. This provided a clearer picture of the levels of a range of process contaminants in foodstuffs that are commonly consumed in the UK.

In the second year of the three-year programme, 326 samples were analysed, covering the 10 food groups below, as defined in the 2007 European recommendation for acrylamide.

1. French fries sold as ready-to-eat, obtained from restaurants, fish and chip shops, and fast food outlets
2. potato crisps
3. pre-cooked French fries/potato products for home cooking
4. bread
5. breakfast cereals
6. biscuits, including infant biscuits
7. roasted coffee, including coffee sold as ground coffee or beans (not brewed)
8. jarred baby foods
9. processed cereal baby foods
10. ‘other products’

A further 91 potato products (excluding prefabricated products*) representing groups 1, 2 and 3 for March 2009, were analysed to enable an assessment of the seasonal variations found within a potato crop year and the effect of cold storage of potatoes on acrylamide levels in the subsequent potato product.

Results from the year two survey

The occurrence and levels for all of the process contaminants surveyed were in line with results from the previous year’s survey and provide reassurance that there has been no increase in concern about the risk to human health.

Acrylamide

- The mean levels of acrylamide in the March 2009 samples were higher than that of the November 2008 samples for the groups 1, 2 and 3. This was probably due to an increase in the sugar levels in raw potatoes, induced in storage.
- The sample of French fries sold as ready-to-eat with the highest level of acrylamide had been cooked to a very dark colour and the edges were burnt. This overcooking, as well as blanching in oil, may account for the high level found.

* Pre-prepared potato products not made from fresh slices
• The acrylamide concentration in all of the breads was relatively low. The inner part of a loaf of bread has lower levels of acrylamide than bread crust, due to the higher moisture content and generally lower temperatures of the crumb component during baking. As bread is analysed as the entire slice/loaf, the bulk of the product analysed is made up of the lower acrylamide crumb component.

• The wide range of acrylamide levels found in the biscuits, reflects the wide range of product types sampled. Ginger biscuits and non-fermented crispbreads often contain higher acrylamide levels, although changes to the processing methods for non-fermented crispbreads have resulted in big reductions. The reasons for the higher levels in ginger biscuits are not fully understood.

3-MCPD

Only certain product groups were analysed for 3-MCPD. Products were chosen on the basis of the sampling plan for acrylamide and previously reported findings of 3-MCPD.

• Low levels were found in roasted coffee and breakfast cereals.

• 3-MCPD was found in non acid HVP containing products and the results found were consistent with other UK surveys.

• The levels of 3-MCPD observed would not increase exposure above the ‘tolerable daily intake’ (TDI) recommended by the Scientific Committee on Food.29

Furan

• The highest levels of furan were found in roasted beans and ground coffee (not brewed), probably as a result of the high temperatures utilised in the roasting process. Due to the high volatility of furan, a considerable amount is lost when brewing coffee. Consumers would therefore not be exposed to the levels reported.

• The detection of furan in potato products that are sold in airtight sealed packets, such as crisps, may arise where any furan produced during the high temperatures experienced in the processing procedure had become trapped in the headspace of the sealed bag.

Ethyl carbamate

The foods analysed were targeted because they were known to undergo some fermentation steps in their production process.

• Some of the ethyl carbamate found to occur in Christmas pudding was due to fermentation but it was largely from the alcohol content. Ethyl carbamate occurs at high levels in some alcoholic beverages as a result of the distillation process used in their manufacture.
Incidents
A key part of the Agency’s work is investigating incidents to ensure that consumer interests, with regard to food safety and food standards, are protected and maintained.

Incident notifications have increased rapidly over the last decade for a number of reasons, including the improved reporting and recording systems, changes in legislation and improved engagement with stakeholders. In 2009, the Agency responded to 1,208 incidents. Figure 7 shows an increase in the number of incidents occurring per year to 2006, followed by a plateau and a slight decline.

**Figure 7: Recorded incidents 2000 to 2009**

Between 2000 and 2006 the steady increase in the number of incidents was due in part to legislative changes, a wider definition of a food incident, and increased incident reporting.

The major categories of incidents and their percentages of the total of incidences in 2009 are shown in figure 8.
A more detailed breakdown of the number of incidents in each category is shown in figure 9.

Figure 8: The major categories of incidents in 2009*

- Microbiological contamination (18%)
- Environmental contamination (17%)
- Natural chemical contamination (12%)
- On-farm incidents (12%)
- Other (40%)

Figure 9: Incidents by category 2009

* The data is taken from the 'Annual report of incidents 2009', which covers the period January to December 2009. The total of the percentages in figure 8 add up to 99% due to rounding down of some of the individual percentages.
A 2009 case study

A large and complex food incident in 2009 involved *Salmonella* associated with eggs.31 In the autumn of 2009, the Health Protection Agency (HPA) identified an increase in the number of reported human cases of a certain type of *Salmonella*. Investigations in the UK and Spain found that some of the cases may have been associated with the consumption of eggs from a specific supplier in Spain. Between 1 September and 31 December 2009, the HPA received reports of 489 cases of *Salmonella* Enteritidis phage type (PT) 14b NxCpl in England and Wales. Of these, 155 cases were associated with 16 outbreaks linked to a care home for the elderly and a number of different catering establishments, some of which were known to have used eggs from the supplier in Spain.

The Agency worked with several UK organisations, including the HPA, local authorities, the Egg Marketing Inspectorate, Defra and Public Health Wales, to identify the source of the cases of illness and to ensure that appropriate action was taken to protect public health. Through effective work with the European Commission and our Spanish counterparts, contamination was traced back to one approved establishment in Spain and the Spanish authorities ensured that eggs laid by the affected flock intended for human consumption would be heat treated to destroy any *Salmonella* and would not be sold in their shells.

The Agency also contacted local authorities and UK distributors and re-issued advice to caterers and other food businesses on how to cook and prepare eggs properly.

We review the handling of significant incidents to ensure lessons are learned and our response continually improves. For example, following the review of the dioxins in Irish meat incident last year,32 the Agency has revised its Incident Response Protocol.33

**Diet and health**

Although some of the earliest civilisations had rules about diet, the study of nutrition probably started with the Greek philosophers in the late sixth century BC, when they wondered what happens to food during digestion.

A healthy balanced diet contains a variety of foods including plenty of fruit and vegetables, plenty of starchy foods such as wholegrain bread, pasta and rice, some protein-rich foods, such as meat, fish, eggs and lentils, and some dairy foods. It should also be low in saturated fat, salt and sugar.

In this section we consider dietary change and how food choices can affect our health.
The National Diet and Nutrition Survey

The pilot study for a new rolling programme of the National Diet and Nutrition Survey (NDNS) was described in the Chief Scientist Annual Report 2007/08. The rolling programme is a continuous cross-sectional survey of the food consumption, nutrient intakes and nutritional status of people aged 1.5 years and older, living in UK households (excluding institutions). The new format of continuous fieldwork provides a more responsive framework for dietary surveys, giving the ability to identify emerging policy issues, respond more rapidly to changing data needs and it gives better opportunities to identify and analyse trends. It is carried out in all four countries of the UK and is designed to be representative of the UK population. It will provide the detailed food consumption data essential to support risk assessments for natural toxicants, contaminants, additives and other food chemicals and will also benefit a wide range of government activities related to diet and health. It is the primary method for monitoring progress against strategic nutrition targets, for example on salt and saturated fat intakes.

In its previous format the NDNS programme comprised a series of cross-sectional surveys, each covering a different age group, from pre-school children through to adults aged 65 and over. There were a number of disadvantages to that approach, such as the data for individual age groups were snap shots in time and there were long gaps between data points. The programme was set up in 1992 and surveys of pre-school children, young people, and older people were carried out in the 1990s, with the most recent NDNS of adults aged 19 to 64 years carried out in 2000/01. Additionally, the Agency published the Low Income Diet and Nutrition Survey in 2007, which assessed the diets of children and adults living in materially deprived households.

The report of the first year of the NDNS rolling programme (NDNS RP), published in February 2010, focuses on food consumption and nutrient intakes of adults aged 19 to 64 years and for children aged 1.5 to 3 years, 4 to 10 years and 11 to 18 years. The results are based on a dietary assessment using a four day estimated diary and the data from the previous NDNS have been recalculated for four-day assessment to enable comparison of data. Results suggest that people’s diet and nutrient intakes are largely similar to findings from previous assessments of diet. However, there are some indications of improved trends of healthy eating.
Figure 10 above shows that intakes of non-milk extrinsic sugars (NMES), such as sugars in fruit juice, table sugar, honey and sugars added to food, in younger children were lower in the latest NDNS than in the last survey of this age group in 1997 but there is no evidence of a reduction in older children. In both cases the intake exceeds the dietary reference value (DRV). NMES are considered to be a major contributor to the development of dental caries.

There was no information available on NMES intakes in 1986/87.
Figure 11 above shows the reduction in saturated fat intake as a percentage of energy between the first adults survey in 1986/1987 and the 2000/01 survey. Mean intake for adults in the latest NDNS is slightly lower than in the 2000/01 survey but still exceeds the dietary reference value (DRV).
Figure 12: Percentage of food energy from total fat: Adults

Figure 12 above shows a similar drop in total fat intake as a percentage of food energy between the 1986/87 and 2000/01 surveys. Mean fat intake in 2000/01 for women met the DRV and for men was just above. Mean intake in the latest NDNS was very similar to 2000/01.
Mean energy intake in 2000/01 was lower for men than in 1986/87 but there was less of a difference for women (figure 13). Mean energy intake in the most recent NDNS was little changed from 2000/01. Mean energy intakes fall below the Estimated Average Requirement (EAR) for energy for both men and women. However, this is likely to be at least partly due to under-reporting of energy intakes in NDNS and not an indication that energy intakes are inadequate.

The independent Scientific Advisory Committee on Nutrition (SACN) published a draft report on dietary energy requirements for the UK population, which went out to public consultation in November 2009 and has been revised in light of the comments received. The report will be discussed further by the SACN Energy Requirements Working Group and then by the main SACN committee.

Some other key findings from the 2008/09 NDNS are shown in the box.
National Diet and Nutrition Survey (NDNS): results from year 1 (2008/09)\textsuperscript{36}

- The population’s trans fat intakes have fallen slightly and remain within recommended levels.

- A third of men and women are now eating the recommended ‘5-a-day’ fruit and vegetables.

- People are still not eating enough fibre, which is essential for healthy digestion. On average intakes are 14g per day for adults, some way below the recommended 18g.

- Consumption of oily fish, which is the main source of omega-3 fatty acids, remains below the recommended one portion per week.

- Iron intakes among teenage girls and women are low, which can lead to iron deficiency anaemia. However, overall, vitamin and mineral intakes among the population are slightly improved.

The discretionary use of salt in cooking and at the table is not captured in the dietary record. Sodium intakes will be reported in the NDNS rolling programme using urinary excretion, derived from 24-hour urine collections, which are part of the survey protocol. However, the results from the urine analysis are not included in the current report as the sample size for year one is too small to report. There will be a larger sample for urinary sodium analyses in adults in spring 2011 to give a more robust estimate of salt intake. The report of this work is expected at the end of 2011.

Examples of changes in food consumption

Sugar and sugar containing products
The consumption of sugar, preserves and confectionery was reduced from past surveys for all age groups. For boys, consumption was reduced from 42g per day in 1997 to 28g per day in the current data and for girls from 34g per day in 1997 to 26g per day in the current data, with smaller decreases for adults since it was last measured in 2000/01.

For adults, although the consumption of sugars, preserves and sweet spreads, which includes consumption of table sugar, was reduced from the previous survey in 2000/01, there was no change for chocolate or sugar confectionery. Whereas children in all age groups had lower average consumption of chocolate confectionery than in the previous survey in 1997.

Crisps and savoury snacks
Consumption of crisps and savoury snacks by children aged from 4 to 10 years was lower than in the 1997 survey but had not changed much in older children and adults.
Milk and milk products
Semi-skimmed milk was the most commonly consumed type of milk for all age groups except those aged 1.5 to 3 years, for whom whole milk continued to dominate, which is in line with government advice. Consumption of milk overall was reduced compared with past surveys; for example, consumption for girls aged 11 to 18 years was 136g per day on average in 1997 and 107g per day in the current survey; consumption for boys of the same age was 208g per day in 1997 and 172g per day in the current survey. For adults, larger decreases were seen, for women from 195g per day in 2000/01 to 120g per day in the current data and for men, from 225g per day to 165g per day. However, the intake of a range of micronutrients that are present in milk, including calcium and riboflavin, has not changed very much, which suggests that other sources of these micronutrients are helping to maintain the nutritional status of the population.

Fat spreads
Reduced-fat spread was the most common type of fat spread used by all age and sex groups and showed an increased percentage of consumers compared with past surveys, while the percentage of consumers of margarines and other cooking fats fell. Many margarines have been reformulated in recent years to reduce the fat content and are now classified as reduced-fat or low-fat spreads.

The Agency’s actions to promote a healthier diet
The Agency’s role in promoting a healthier diet in the UK was in support of wider public health policies of reducing related chronic disease. We have worked in partnership with food businesses and others. We have built on our strong nutrition science expertise, analysis of the evidence base, and the high degree of consumer trust in our advice, to ensure that people have the information they need to make choices and understand about safe food and healthy eating.

The interactive NHS tool, the ‘Atlas of Risk’ provides a clear visual indication of the main causes of death and can be navigated to compare health risks. Heart and circulatory disorders are shown to be the main cause of death in England (see the box).
Some causes of death are unpreventable or untreatable, but for many of the most common causes, such as cardiovascular disease (CVD) (including coronary heart disease and stroke) and cancer, lifestyle choices, including diet, can influence the risks we face. Obesity continues to be one of the biggest public health challenges facing the UK.\textsuperscript{39}

**Obesity trends**

Obesity is calculated using body mass index (BMI), which is measured by dividing a person’s weight (in kilograms) by the square of their height (in metres).\textsuperscript{40} A BMI of 25 to 30kg/m\textsuperscript{2} is considered overweight and a BMI of 30kg/m\textsuperscript{2} and above is classed as obese.
An independently measured assessment for England estimated that 25% of adults are now classed as obese (2008). Similar robust assessments for Scotland suggest 27% of adults are obese (2008) and in Northern Ireland 24% of adults are obese (2005/06). In Wales it is estimated that 21% of adults are obese, based on self reporting (2008).

According to the Health Survey for England, the prevalence of overweight adults and obesity in adults has increased over the last two decades. The prevalence in obesity has increased from an average of 15% of adults in 1993 to 24.5% in 2008. The trend for overweight including obese adults has seen a smaller increase from an average of 53% of all adults in 1993 to 61% in 2008 (see figure 14 for separate trends for men and women).

**Figure 14: Trends in overweight and obese adults**

Since 2000 the rate of increase in prevalence of overweight and obese adults (BMI > 25kg/m²) has slowed down and the trend may be flattening out. However, it is too soon to tell whether a gradual upwards trend will continue. There are clear indications that the decline in the percentage of the population falling within the normal BMI range has stabilised (see figure 15).
The trend for children is different.\textsuperscript{41} In England, among boys and girls aged 2 to 15, the proportion who were obese has increased overall between 1995 and 2008. The increase was from 11\% in 1995 to 17\% in 2008 for boys and from 12\% in 1995 to 15\% in 2008 for girls. There has been a slight overall downwards trend for both boys and girls since 2004 and 2005, but it is not possible to tell whether this trend will continue (see figure 16).
The UK Foresight report ‘Tackling Obesities: Future Choices – Project Report’ published in 2007 contained the prediction that by 2050, 60% of men and 50% of women could be clinically obese. The report draws primarily on the comprehensive data from the Health Survey for England up to 2004. The National Heart Forum (NHF) has continued to develop the work presented in the Foresight report and produced an update to the adult obesity and associated disease projection based on obesity prevalence to 2007. The table below shows that by 2020, despite the recent slowing in the rate of increase in obesity amongst adults, current projections for obesity are only marginally less than those predicted in the original Foresight report.
## Predicted incidence rates for obesity in adults

<table>
<thead>
<tr>
<th>Predictions to 2020</th>
<th>% Based on Foresight report incidence rates 1993-2004</th>
<th>% Based on updated incidence rates 1993-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged 20-65, male</td>
<td>44 (±4)</td>
<td>41 (±2)</td>
</tr>
<tr>
<td>Aged 20-65, female</td>
<td>39 (±3)</td>
<td>36 (±2)</td>
</tr>
<tr>
<td>Aged 40-65, male</td>
<td>45 (±5)</td>
<td>44 (±3)</td>
</tr>
<tr>
<td>Aged 40-65, female</td>
<td>41 (±4)</td>
<td>38 (±3)</td>
</tr>
</tbody>
</table>

Adults, predicted BMI distributions >30 at 2020. The numbers in brackets are the statistical uncertainty to the 95% confidence level.

Source: National Heart Forum
www.heartforum.org.uk

The UK Foresight report estimated the public cost of people being overweight or obese by 2050 to be £49.9 billion if the trend in obesity continued and everything else, including the value of money, remained the same.

### Agency action on obesity

The aim to improve the UK population diet and to tackle obesity is one of the major themes in the Department of Health’s report “Healthy Weight, Healthy Lives; a Cross-Government Strategy for England” published in January 2008.47 The Healthy Food Code of Good Practice, sets out seven areas for companies in every food sector to take action, to demonstrate their commitment to promote healthy eating (see the box).

#### The Healthy Food Code of Good Practice*

The code sets out seven areas where action can be taken:

- front-of-pack labelling
- smaller portion sizes for energy-dense and salty foods
- promotion of food to children
- reductions in consumption and the levels of saturated fat and sugar in food, in particular the consumption of sugary drinks
- improving the balance of the diet
- single set of key healthy eating messages
- nutritional information on food eaten out of the home

*The code was extended in 2009 to cover obesity to include a specific action on energy balance
This is an area where the Agency has had a key role to play working closely with the Department of Health and others in England on a number of initiatives. There were similar partnerships with other key government and non-government organisations in other parts of the UK.48, 49, 50, 51

Catering and out-of-home eating
Whereas eating out was once a treat for many families, it now has a significant place in people’s diet. The Cabinet Office Food Matters Report52 estimated that one in six meals is now eaten out of the home, and NDNS data53 suggests that men consume around a quarter of their calories eating out and women a fifth.

The catering industry is large and diverse – in 2008 some 250,000 outlets served eight and a half billion meals with annual sales of £30.6 billion.54 The Agency has worked on a range of activities to help consumers have access to healthier choices when they eat out. These cover three areas:

- catering commitments
- working with small businesses
- calorie labelling at point of choice

Commitment documents from 45 of the UK’s largest caterers, that have been updated annually, set out actions the companies have undertaken and are planning towards healthier catering and cover procurement, menu planning, kitchen practice and consumer information.55 The Agency has also been developing guidance for small businesses.56

In January 2009 the Agency announced its intention to work with catering companies to provide voluntary calorie labelling at point of choice. The headline results of qualitative research that explored what information consumers want when they eat out were published in April 2009.57

Calorie labelling in catering research
Overall consumers were content for calorie information to be made available as the decision to make use of it would be a matter of personal choice, although there were isolated instances of participants who felt they would rather not be exposed to it.

The outcome of an independent evaluation commissioned by the Agency was published in December 2009.58 Three factors were found to impact on consumers’ capacity and inclination to use calorie information: if it stood out from other product information; their understanding of how it related to healthy weight management and if information was presented in a positive way.
During the summer of 2009, 21 companies introduced calorie labelling in around 450 catering outlets as part of a trial organised by the Agency.\(^5\) By spring 2010 this had increased to over 1,000 outlets, including workplaces and a range of retail caterers.

A consultation\(^6\) on a UK-wide scheme developed from the criteria used in the pilot closed in March 2010 and the results are expected to be made available later in the year. It also sought information on issues such as obtaining calorie information, and feedback from individual businesses on their experiences of providing nutrition information at point of choice.

**Guidance for caterers**

The Agency has produced practical guidance,\(^6\) including weekly example menus, to help caterers across the UK provide food that meets the nutritional needs of adults (for example in workplace canteens, hospitals, prisons, local and central government) and older people in residential care homes. The advice is designed to help caterers reduce saturated fat, salt and sugar intakes, and improve consumption of some vitamins and minerals.

**Saturated fat and portion size**

The Agency’s Saturated Fat and Energy Intake Programme\(^6\) published in 2008, outlined the areas for action to address current high intakes of saturated fat and it supports the UK cross-government action to tackle obesity.\(^47, 48, 51, 63\)

Intake of saturated fat is still on average 20% higher than public health recommendations. Over time a diet high in saturated fat can raise cholesterol levels in the blood, which is a risk factor for heart disease. The Agency has engaged with the food industry and others to help us understand the technical, legal and consumer acceptability challenges to reformulating products and it has developed voluntary recommendations to industry. We have focused on food sectors that make the biggest contribution to saturated fat and added sugar intakes. Following public consultations in 2009, the Agency published recommendations in March 2010 about soft drinks with added sugar, chocolate confectionery, biscuits and cakes.\(^64\) A further consultation on recommendations about pastry, dairy products, meat products, savoury snacks and promotional activity in general was launched at the end of 2009. The recommendations build on the work already achieved by the most progressive food and drink companies and challenge the whole industry to help improve the health of the nation.

A second phase of the Agency’s saturated fat campaign was launched in January 2010 with a 21-day Sat Fat Challenge designed to encourage people to lower their saturated fat intake.\(^65\) The campaign used press and poster advertising, with a focus on encouraging semi-skimmed milk users to switch to the now widely available 1% fat milk.

**An update on salt**

High blood pressure is a serious public health problem in the UK. Eating too much salt can increase the risk of developing high blood pressure (also known as hypertension).
which in turn, increases the risk of cardiovascular disease (CVD).\textsuperscript{66} The 2008 Health Survey for England\textsuperscript{41} showed that 32% of men and 29% of women had high blood pressure and that 54% of men and 43% of women found to have hypertension in the survey were not on any treatment for it. The risk from CVD is not restricted to people with high blood pressure. There is a continuous relationship between increasing blood pressure, from as low as 115/75 mm Hg (normotensive), and risk of death,\textsuperscript{67} which means that the higher the blood pressure the greater the CVD risk.

Coronary heart disease (CHD) is the most common cause of death in the UK. About 91,000 people died from CHD in 2007. Stroke is the third biggest killer in the UK with about 53,000 deaths in 2007 and it is a leading cause of severe disability.\textsuperscript{68}

A study funded by the British Heart Foundation and the European Heart Network established that the cost of CVD to the UK economy was £30.7 billion in 2006, via health care costs, informal care costs and productivity losses.\textsuperscript{68}

### The effects of high blood pressure on health

Eating too much salt increases the risk of developing high blood pressure, which causes structural and functional changes in the heart and blood vessels.\textsuperscript{69, 70} High blood pressure can:

- Increase the strain on the walls of the arteries. To cope with this the muscles in the artery walls become harder and thicker, which reduces the space inside the arteries and obstructs the flow of blood to the body’s organs. This means that they are deprived of oxygen and the nutrients they need and can become damaged as a result. The constant strain of blood flowing at high pressure through a damaged artery can eventually lead to a rupture and internal bleeding.

- Damage the arteries leading to the brain. Narrowing of the arteries to the brain will reduce the amount of blood reaching the brain, which may lead to vascular dementia. If this part of the brain is deprived of oxygen, it will cause brain cells to die and result in a stroke.

- Damage the arteries that lead to the heart. This can cause chest pain (angina). Severe damage to the arteries may cause them to burst or become blocked by a blood clot, which causes a heart attack.

- Damage the heart. The heart has to work harder to pump blood around the body which causes the left ventricle of the heart to stiffen and enlarge (left ventricular hypertrophy) and this reduces its ability to pump blood around the body. The strain on the heart can eventually lead to heart failure.

- Damage the kidney by damaging the arteries leading to the kidneys as well as smaller blood vessels within the kidneys. This makes it more difficult for the kidneys to filter waste effectively from the blood and can eventually lead to kidney failure.
In 2003 the Scientific Advisory Committee on Nutrition (SACN) reported on the relationship between salt and blood pressure and the associated risks to health and recommended a target reduction of salt intake to 6g per day for adults and less for children and babies.

A reduction in salt intake has been shown to lower blood pressure. Other lifestyle changes, such as reducing alcohol intake, losing weight and increasing physical activity can also help to lower blood pressure.

Urinary sodium analysis results for work undertaken in 2008 suggest intakes of salt in the UK have reduced to 8.6g a day on average, which although is higher than the recommended 6g per day, is almost a gram less than was being consumed in 2000/01.

The salt campaign

In 2004 the Agency initiated a campaign to raise awareness of salt as a public health risk and to help UK consumers reduce their salt intake.

- Phase one (2004): aimed to raise awareness that too much salt is bad for your heart.
- Phase two (2005): consumers were made aware of the 6g recommended daily salt intake level and were encouraged to check the label and choose lower salt foods.
- Phase three (2007): the message was that 75% of the salt we eat is already in the food we buy, so people should check labels and try to choose lower salt foods.

The aim of the fourth phase of the salt campaign launched in October 2009 was to remind people to pay attention to the salt levels in the food they buy and to check labels to find out if their food is ‘full of it’.
The fourth phase of the salt campaign

The key messages included:

• most of the salt we eat is already in everyday foods
• salt intake can be reduced by checking the labels to compare products, and choosing the option lower in salt
• we should aim to have no more than 6g salt per day, and children under 11 should have less than this

The Agency also introduced a facility for web-enabled mobile phone users to check their shopping’s salt content, check the recommended limit for their daily salt intake and get tips to reduce it.74

This phase of the campaign included TV, radio, press and online ads, as well as posters on billboards and buses.
Salt’s role in food

Salt plays a variety of roles in food as illustrated below. The leading companies have removed much of the added salt from their products. Salt reduction in some foods will be limited by food safety and technical constraints.

Salt’s role in food and the limitations of salt reduction

However, there remains a wide variation of salt levels in similar foodstuffs and there is more that can be done to reduce the levels of salt used in some foods.

The Agency published voluntary salt reduction targets for 85 categories of food in 2006. A public consultation on proposals to revise the targets for a limited number of food categories for 2010, and new targets for most foods for 2012, was published in 2008. Levels of salt in food, expert advice on technical and safety issues, ongoing research and data on current intakes were also taken into consideration. Detailed responses were received from a range of organisations that covered many aspects of the work to set salt targets. The final revised targets for 80 categories of foods were published in May 2009.

The targets reflect the reductions that have already been achieved by industry for a range of foods, including branded pre-packed sliced bread, branded breakfast cereals, cakes and biscuits, snacks, processed cheese products, cooking and pasta sauces and soups. The revised salt reduction targets for 2012 have been set at levels that aim to have a real impact on salt intakes, while taking into account technical and safety issues. They are more challenging than the previous targets and will require more fundamental changes to the manufacturing processes and recipes.
Further developments in food technology, including alternatives to salt and other sodium-based ingredients, changes in manufacturing and distribution chain processes, and acceptable food safety testing, will be necessary to ensure further progress, as will rebalancing product flavours to maintain consumer acceptability.

Consumer awareness about salt in food

Qualitative consumer research has helped to inform the UK position and feed into international discussions on labelling of salt and sodium information on food.

Exploring public understanding of salt and sodium labelling

The research included a combination of group discussions and in-depth interviews. It indicated that:

- Participants had a greater awareness and understanding of salt and of the health consequences of eating too much salt than of sodium.
- Although awareness of the sources of food in which salt can be found was incomplete by those taking part in the research, it was much better understood than the sources of sodium.

Views on current salt and sodium labelling and supporting information, and preferences for this information, were:

- Participants expressed an overall desire for labelling to show information on salt and sodium content as consistently, clearly, prominently and unambiguously as possible.
- There was a strong overall preference amongst participants for the use of the term ‘salt’ rather than the term ‘sodium’ on labelling information.
- Participants, more typically people attempting to reduce their or someone in their households’ salt or sodium consumption, initially preferred the focus of food labelling to be on sodium. However, on further reflection, they felt it may be better to focus on salt to prevent confusion, but with additional information about the relationship between salt and sodium, to use if they wanted to.
- Although not technically correct, participants consistently preferred the term ‘salt, of which sodium’.
- Participants felt that it was important that any communications about salt and sodium have synergy with the way products are labelled, to support consumers in making informed choices.
International action on salt

As a result of the Agency’s participation in World Health Organization (WHO) and European Commission initiatives, we have influenced adoption of the Commission’s approach on voluntary salt reduction and all 27 member states and two European Free Trade Association (EFTA) countries have now signed up to taking action on salt.\(^72\) The framework for action on salt covers work: to identify the baseline position in terms of levels of salt in food and intakes; with industry to reduce levels of salt in a number of key foods by 16% by 2012; to raise consumer awareness of the issues; and to monitor changes of salt in food and intakes. The first progress reports are due later in 2010. This is an important development as the majority of food imported into the UK is from the EU. The Agency also leads the European Salt Action Network, which shares best practice in a network of countries, from the European region of the WHO, working on salt reduction.

In April 2010, the New York City Health Department, which is part of the National Salt Reduction Initiative in America, published voluntary salt targets.\(^78\) The US salt reduction work is voluntary and New York City has acknowledged that ‘it is modelled after a successful initiative developed in the UK’ and it cited the Agency’s salt reduction successes to show how it can work.

Find out more about the Agency’s work

You can find out more about the work reported by using the live links throughout the report. The annexes to the report provide further information and links to individual projects and activities of the scientific advisory committees.

A list of key publications and web references is given in the box below.

Copies of research reports can be obtained from:

foodbase.org.uk or the Chief Scientist Team at: CST@foodstandards.gsi.gov.uk or 020 7276 8948
Further information
General information on food safety. This covers microbiology, chemical contaminants, radiological contaminants food.gov.uk/safereating/

Food alerts food.gov.uk/enforcement/alerts/

Annual incidents reports food.gov.uk/foodindustry/incidents/monitorprevent/reportsreviews/

Food hygiene food.gov.uk/safereating/hyg/

TSEs food.gov.uk/safereating/animaldiseases/

Food allergy food.gov.uk/safereating/allergyintol/

Nutrition food.gov.uk/healthiereating/

Strategic plan 2010–2015 food.gov.uk/aboutus/publications/busreps/strategicplan/

Science and evidence strategy food.gov.uk/science/researchpolicy/scistrat
Since its establishment, the Agency has had science at the centre of its policy formulation and advice to stakeholders. This was recognised in the Government Office for Science’s Review of the Agency, published in April 2009.79

‘From the outset the Agency’s credibility and success was linked to its ability to ensure a robust and transparent approach to the use of science to inform food policy. The Agency is considered to have achieved a great deal in this respect. There has been a transformation in the way that it approaches risk issues, with far greater transparency and increasingly clear recognition of the role of social science.’

Professor John Beddington
Chief Scientific Adviser

Science is at the heart of the Agency’s work. It covers a wide range of resources and activities, including:

• our staff – some 50% of those working in policy functions are scientists
• independent expert advice
• the Agency’s science evidence gathering
• the international science base and community

Spending on science

The Agency has typically spent between £25 million and £30 million on commissioned science and evidence,* about 17 to 20% of our total resource, among the highest such proportions in the UK government. In 2009/10 we spent around £25 million, using the wider definition of evidence that we are introducing in the coming year (see Chapter 3). This now includes surveillance and monitoring to help with our statutory duties. In the last year we spent around £2.5 million on radiological monitoring and surveillance of

* Figures in previous Chief Scientist Annual Reports are not directly comparable. In the 2008/09 we reported a total spend of approximately £20 million on research and surveys. If we re-calculate this using the new definition of evidence, the total spend would have been around £26 million.
which around two thirds was subject to recovery from industry and we spent a further £4.2 million on shellfish and marine biotoxin monitoring and surveillance. Figure 17 shows how the spend was divided between the strategic themes.

**Figure 17: Division of the Food Standards Agency’s spend on science and evidence for financial year 2009/10**

![Pie chart showing the division of the Agency's spend on science and evidence for 2009/10. The largest slice is Food Safety (60%), followed by Eating For Health (33%), Underpinning Delivery (4%), and Choice (3%).]

Full details of the science and evidence funded by the Agency over the last year is provided in Annexe A.

The Agency also works with other funders to help develop and benefit from the wider base of evidence and expertise, in the UK and internationally. In 2009/10, the Agency provided a total of £5.5 million to co-fund 30 projects. This represents around a quarter of the Agency’s total spend on research. The National Diet and Nutrition Survey (NDNS) (see Chapter 1), the Diet and Nutrition Survey of Infants and Young Children and the Infectious Intestinal Disease (IID-2) study² made up a significant part of this. The dietary surveys cost around £4.5 million in 2009/10 to which the Department of Health contributed around £1.0 million. The Agency also provided £1.2 million for the IID-2 study and around £0.3 million to six EU projects with strong links to Agency needs in 2009/10. The EU funds an extensive programme of research, principally through its Framework Programmes.⁸⁰

The Agency is contributing to three co-funded projects under the Biotechnology and Biological Sciences Research Council (BBSRC) Government Partnership Award Scheme on foodborne illness and one project with the Medical Research Council (MRC) and Kings College London on allergy (see the section on developments in peanut allergy research later in this chapter). Further details of the portfolio of Agency co-funded projects for 2009/10 are given in Annexe B.
Comparing the expected total Agency spend over the lifetime of the 30 co-funded projects (£34 million) with the total value for all funders (over £150 million) gives an indication of the added value achieved by co-funding. We will continue to develop partnerships in the UK, EU and beyond in areas within the Agency’s remit.

More information on the key partnerships the Agency is involved in, including the plans for further joint work with the MRC on food allergy, is given in Chapter 3 and details of the cross funder approach with the BBSRC and Defra to control *Campylobacter* is given in Chapter 1.

**Programme to deliver more risk-based, proportionate meat controls**

The Agency has set a new strategic priority, to establish a programme to deliver more risk-based, proportionate official controls on meat.

Official meat controls, particularly post-mortem inspections of meat, are based on a traditional inspection approach that was developed more than a hundred years ago to tackle the public health concerns of that era, such as parasites and defects visible to the naked eye. Today, the main causes of foodborne disease are microbiological, such as *Campylobacter, Salmonella* and *E. coli*, which cannot be tackled using traditional inspection methods.

In September 2009, the Agency’s Board endorsed a programme of work that outlined the future steps to deliver an enhanced system of official controls on meat. In November 2009, the Agency began gathering the scientific evidence necessary to support a case for change, which will form the basis for future negotiations with other European Union (EU) member states. Official controls are prescribed by EU hygiene regulations.

The Agency is evaluating a range of inspection activities that are performed in approved meat establishments. Research is being undertaken to examine the following areas:

- post-mortem inspection tasks
- use of inspection data and food chain information
- analysis of roles (such as official veterinarian presence when plant inspection assistants carry out post-mortem inspection of poultry)
- requirements for outdoor pig processing
- ante-mortem inspection of young/prime animals and poultry

The findings of this research will be used to build a case for change and to inform further research plans, which will include cost-benefit analyses and social science studies.

A scientific steering group will evaluate existing research, advise on the scientific approach, evaluate the results of relevant studies and advise on the evidence needed to develop proposals. This group will also provide a challenge function to Agency in-house veterinary expertise and up-to-date expertise in veterinary public health.
Food hygiene delivery

There has been renewed attention to the issue of cultures and behaviours in businesses and enforcement bodies as they relate to compliance with food hygiene legislation, following the *E. coli* O157 outbreak in South Wales in 2005 and the publication of the Pennington Public Inquiry Report in 2009.82 The report concluded that the outbreak was caused by cooked meats that had been contaminated with *E. coli* O157 due to serious and repeated breaches of Food Hygiene Regulations by the food business operators (FBOs) involved in the chain of supply.

The Agency is addressing the report’s findings and recommendations that lie within our remit. The work programme will cover all foodborne pathogens and all food groups across the UK and delivery through the Agency, local authorities and the Northern Ireland Department of Agriculture and Rural Development (DARD) (see the box).83

Work on hygiene behaviours and food safety cultures84

The aim of the research, which is due to be completed in summer 2010 is to:

- investigate culture and behaviours in businesses and enforcement bodies in relation to compliance with food safety legislation
- investigate the communication between individuals in these two groups, to understand what works to secure regulatory compliance particularly, though not exclusively, in relation to food safety

A desk review will draw on UK and international food safety literature, as well as evidence on culture and compliance with legislation, to identify where lessons can be learnt for food safety.

The report will include recommendations on what works to improve compliance, discussion of the policy implications of the findings and suggestions for future research.

Highlights of the Agency’s science during 2009/10

In this section we highlight particular pieces of research that have been completed in the past year. Comprehensive details of all research work undertaken by the Agency in the last year are available in Annexe A of this report.

Research reports of completed projects are available on our open access repository at foodbase.org.uk/

Food safety

A key objective for the Agency is to improve food safety. One of our main priorities is to reduce foodborne illness using a targeted approach.
Microbiological safety

The Agency supports research in areas extending from ‘farm to fork’, involving work with all sectors of the food chain.

*Campylobacter* is a major cause of infectious intestinal disease and the Agency has focused its microbiological safety research on this organism. See Chapter 1 to find out more about the Agency’s targeted approach to tackle *Campylobacter* infection. Our strategy for reducing *Campylobacter* in chicken is underpinned by an evidence base, much of which is delivered through our research programmes. Our research covers surveys to identify prevalence, work to identify effective interventions in reducing levels of infection, identification of best practice for minimising the spread of *Campylobacter* and baseline data to measure the impact of interventions to control *Campylobacter*.

Several projects that aimed to improve understanding of the causes, spread and control of *Campylobacter* infection were undertaken in Scotland (see boxes).

**Case-control study assessing private water supplies as a risk factor for *Campylobacter* infection in Aberdeenshire and Aberdeen City**

Human cases of *Campylobacter* infection and ‘control’ participants were recruited to the study and asked to complete a postal-administered questionnaire on their exposure history and to allow for a sample of household tap water to be tested for coliforms, *Campylobacter*, enterococci and *E. coli* (including O157). The study also employed molecular typing of *Campylobacter* to further understand its epidemiology.

Risk factors identified for *Campylobacter* infection included:

- consumption of water from a private water supply
- travel outside of the study area
- consumption of chicken outside of the home

There was no significant correlation between the seasonality of private water consumption and *Campylobacter* infection. The study found that private water supplies were significantly more likely to be contaminated with coliforms, *E. coli* and enterococci than mains water supplies. However, there was very little difference in the quality of private water supplies belonging to cases compared with those of controls.

The linkage of epidemiological data to molecular typing data showed that both travel abroad and having contact with farm animals were significantly associated with the specific molecular type of *Campylobacter* with which the case was infected.

Final report to be published later in 2010.
The molecular epidemiology of Scottish *Campylobacter* isolates from human cases of infection using multilocus sequence typing (MLST)\(^8\)

Clinical *Campylobacter* isolates were obtained from Scottish NHS diagnostic laboratories over a 15-month period and typed using MLST. These were compared with the MLST profiles of more than 1,000 food and environmental isolates, collected over the same period throughout Scotland, to attribute human cases of *Campylobacter* infection to known sources of infection. This represents the world’s largest national, contemporaneous comparison to date of *Campylobacter* strain types from clinical cases and a broad range of environmental and food sources of infection.

Key findings from the study included:

- A highly diverse range of strain types (MLST profiles) were observed across all of the clinical, food and environmental isolates analysed.
- Retail chicken was identified as the single largest source of *Campylobacter* infection in Scotland. However, farm ruminants could also be a significant risk factor although further research is required to determine the relative importance of the routes for human infection via these sources.
- The diversity of clinical strain types was spread across Scotland and there was no indication of particular strains being more common in some regions than in others.
- Isolates from cases that were already known to be linked (outbreaks) included common strain types, but more generally only a small proportion of isolates were clustered, with the majority of clinical cases that occurred during the period of the study appearing to be sporadic.

These results demonstrate the importance of chicken in human campylobacteriosis in the Scottish population and they support the need for intervention strategies targeted to the broiler food chain. MLST has proven to be a useful tool for attributing human cases to sources of infection and it has the potential for measuring the impact of future interventions in the poultry production chain. There is a need for further work to elucidate the significance of farm ruminants as a direct or indirect source of human infection.
Identifying risks and explaining spatiotemporal patterns of human campylobacteriosis across Scotland

The rate of human *Campylobacter* infection varies widely across Health Boards in Scotland and this study aimed to identify the reasons for this geographic variation. Using the data obtained in the MLST project (see previous box) it also examined issues such as urban versus rural environments, deprivation, travel and outbreaks.

The findings include:

- There were real differences in the geographic distribution of *Campylobacter* infections within Scotland caused by differences in exposure to infection.
- There were higher rates of *Campylobacter* infection reported in less deprived areas. At least part of the difference is likely to be a result of real differences in rates of infection, although some may be due to differences in ascertainment, which is the process of measuring the levels of disease in the community.
- The majority of cases were attributed to retail chicken for all age groups and private water sources were also identified as a significant risk factor for *Campylobacter* infection.
- Although animal reservoirs were examined as a potential risk factor, analyses did not identify a significant risk, other than in children living in rural areas who had an enhanced risk of infection in areas of higher sheep density. Source attribution methods also suggest that chicken is less important than ruminant sources for infection of rural children compared to their urban counterparts.
- The limited evidence for strong spatial or temporal associations suggests *Campylobacter* infections are very sporadic and unrelated. Only about 5% of cases were household outbreaks and up to a further 15% of cases were clustered.
- Particular MLST types, such as ST572, were associated with foreign travel and there was some evidence for common indigenous types (ST21, ST45 and ST257).

Final report will be published later in 2010.
The results suggest the likely sources of infection are environmental for ruminant associated strains and consumption of contaminated food for poultry associated strains. The results demonstrate that the relationship with deprivation is unlikely to result from differences in acquired immunity. There are large differences in ascertainment between the deprived and the less deprived, as well as differences between the authorities administering the health care, and therefore accurate quantification of the level of under reporting would aid further studies.

The *Campylobacter* in poultry research programme has been successful in propagating collaborations with other research funding bodies, in particular Government Partnership Awards (GPAs) with the BBSRC. There have been a number of joint-funded projects with Defra, such as a national survey of *Campylobacter* prevalence in broiler flocks from 2007 to 2010, which will provide valuable baseline data to measure the impact of interventions to control *Campylobacter*. With the recent development of a joint UK Strategy for Research and Development on *Campylobacter*, future research funded by the Agency, Defra and BBSRC will be more coordinated and will feed into practical outcomes in the control of *Campylobacter* infection.\(^\text{12}\)

**Phytoestrogen research**

The Agency’s work under the phytoestrogen research programme aimed to establish whether phytoestrogens:

- adversely affect human health, including reproductive function
- and/or have any beneficial effects on human health

The following study examined the relationship between the dietary intake of phytoestrogens and the risks of cancer.
A rapid and sensitive method for the analysis of phytoestrogens in foods was developed using liquid chromatography coupled with mass spectrometry (LC/MS) and automated solid phase extraction.

Foods were analysed for phytoestrogen content and the values were incorporated into an established nutritional prospective study data base of diet and cancer, known as the European Prospective Investigation of Cancer (EPIC).

The relationship between dietary intake of phytoestrogens, and biomarkers of intake in blood, and urine samples, was compared to the incidence of breast and prostate cancer in the EPIC study.

The key findings were:

Figure 18: Summary of phytoestrogen content (in μg per 100g wet weight) in different types of food of animal origin (excluding soya, textured vegetable protein or mycoprotein-based substitutes; and *excluding ice-cream roll)
• The phytoestrogen content in most foods analysed (see figure 18) was well below 100µg per 100g wet weight. Only 5% of foods commonly consumed in the UK contain more than 700µg phytoestrogen per 100g wet weight. The highest amount of phytoestrogens (mainly isoflavones) was found in soya flour and other soya products.

• For the first time, the phytoestrogen content of foods of animal origin was also determined. Meat, fish, seafood, eggs and dairy products were all found to contain phytoestrogens, with an average content of 20µg per 100g.

• Of particular note was the difference in phytoestrogen content observed in soya-based infant formula, which was found to be 300 times greater than that of traditional infant formula (19,221µg/100g versus 59µg/100g).

• The study established that preparation and cooking can have a marked effect on the phytoestrogen content of food. The phytoestrogen content of fruit and vegetables decreased significantly when they were boiled, as the phytoestrogens leached into the discarded water. Peeling fruit and vegetables also reduced their phytoestrogen content.

• No relationship was found between the dietary intake of phytoestrogens and the risk of breast or prostate cancer amongst individuals in the EPIC study.

• The mean dietary intake of phytoestrogens was found to be similar between the controls and cases of breast and prostate cancer.

We have three ongoing projects that are examining the safety of phytoestrogens in specific subgroups of the population for whom there has been a suggestion of risk: individuals with sub-clinical hypothyroidism, men with low testosterone and a further study will examine the effects of phytoestrogens on bone metabolism in post-menopausal women.
Improving consumer choice and standards of food production

In this section we describe recently completed projects on food authenticity, that investigated whether food purchased matches its description. The aim of the work was to enable consumers to make informed choices about the food they buy and to ensure that descriptions of foods are accurate and not misleading.

Food authenticity

Over the past 10 years, the Agency has supported the development of DNA-based approaches for the detection and quantification of food ingredients, and these have been used to address a number of food authenticity issues. A recent initiative under the authenticity programme has been the transfer of existing DNA-based methods to detect food misdescription to a capillary electrophoresis lab-on-a-chip (LOC) system, which allows accurate sizing and quantification of DNA fragments. This has provided a suite of methods to verify food labelling on an easy-to-use, cost-effective system suitable for routine screening of samples by public analysts.

A number of methods have now been successfully transferred. Work to transfer existing DNA methods to detect orange juice adulterated with mandarin and grapefruit juice to a LOC platform was reported in 2009/10 (see the box).

Evaluation of DNA-based methods for fruit juice authenticity using LOC electrophoresis endpoint detection

Orange juice may be adulterated with fruit juices obtained from other citrus species, such as mandarin or grapefruit, to improve its apparent quality. In orange juice, the presence of juice obtained from citrus species other than orange must be labelled accordingly, and failure to do so would be misleading to the consumer.

Two different polymerase chain reaction (PCR) assays for fruit juice authentication were transferred to the lab-on-a-chip (LOC) system and evaluated for qualitative and quantitative determination of adulterated orange juice samples:

- a PCR restriction fragment length polymorphism (RFLP) assay demonstrated the detection of grapefruit juice in orange juice with a limit of detection of 10% volume for volume (v/v)
- a PCR heteroduplex assay for detecting mandarin juice in orange juice demonstrated greater sensitivity, with a limit of detection of 2.5% v/v

The PCR heteroduplex assay method is based on amplifying a section of DNA that is slightly different in size in mandarin and orange species. When the DNA strands join together (or reanneal) after they have been amplified, either DNA from the same
species reanneals, to form homoduplexes, or, if mandarin is present in the sample, some DNA from orange and mandarin will reanneal, to form heteroduplexes. The hetero/homoduplexes can be distinguished and quantified on the LOC system. The methods have been validated using a blind trial of fruit juice mixes to assess the ability of the assay to detect adulteration, especially at low levels.

The research results have been published\(^9\) and standard operating procedures for these two methods have been produced. The grapefruit detection method was considered relatively insensitive and therefore not suitable for reliable detection of adulterated orange juice. However, the mandarin detection method was suitable for use and a training course and challenge exercise for public analysts were undertaken to facilitate technology transfer and uptake of this method in enforcement laboratories.

Example data for the detection of mandarin juice in orange juice following heteroduplex analysis using PCR and the LOC. Samples in lanes 1 to 6 contain 0, 2.5, 5, 10, 15, and 50% v/v mandarin in orange juice respectively:

<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Sample 3</th>
<th>Sample 4</th>
<th>Sample 5</th>
<th>Sample 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

- Upper DNA size marker
- Heteroduplexes
- Homoduplexes
- Lower DNA size marker
The Agency has also been active in developing new approaches to detect undeclared animal protein-based water-retaining agents in chicken, because there is evidence that the highly processed nature of these proteins renders them undetectable by traditional DNA and protein-based techniques.

Fresh chicken meat bought at supermarkets or butchers cannot have any ingredients, including water, deliberately added to it. However, processors can add water to chicken products or preparations for a number of reasons, for example to improve the succulence of the meat after it has been cooked. Where chicken products contain greater than 5% added water, and ingredients from a different animal species (e.g. hydrolysed pork protein), these must all be declared in the name of the food and listed as ingredients under labelling rules. The agents used to hold added water in chicken can include salt, phosphates and hydrolysed animal proteins.

The Agency has previously commissioned work to develop proteomic methods to speciate meat and animal derived ingredients in food. In June 2009 we announced the results of a small scale exploratory study into several water-retaining powders that claimed to contain only chicken protein (see the box).

A proteomic approach to detect water-retaining agents in chicken

This study applied these experimental proteomic approaches to determine the animal origin of the protein powders.

The proteomic approach involves enzyme digestion of the proteins in a sample followed by separation and detection using liquid chromatography tandem mass spectrometry (LC/MS/MS) to detect the size and sequence of the peptides (protein fragments) present in the sample. Using specialist software, peptide sequences are then matched with public and private databases of known protein sequences to reveal the highest match and the likely protein from which the peptide derives. The study indicated the presence of bovine and porcine peptides in some of the powder samples, suggesting they were not from a chicken source as claimed.

This is not a food safety issue and hydrolysed pork and beef proteins can be used in chicken as long as they are properly labelled. However, it is important that people are given accurate information about their food. The Agency is carrying out further studies to fully develop and validate the proteomics method and is gathering more information in partnership with other European member states.
Eating for health

Work under the Agency’s nutrition, diet and food choices research programmes have investigated relationships between the nutrients in our food and our health, and it has provided the scientific basis needed for dietary advice to improve public health.

Diet and cardiovascular health

The objective of this programme was to focus on long term intervention studies in free living humans, examining the effects of modifying diet on cardiovascular health. We present two studies completed in 2009 (see the boxes below).

Comparison of effects of increased wholegrain foods on markers of cardiovascular disease risk

Individuals aged 40 to 65 years, who were sedentary and those who had signs of metabolic syndrome* were included. Volunteers were excluded if they had a high habitual wholegrain intake or took medication or supplements that could affect the outcome measures.

Participants took part in a four-week run-in phase, where they all consumed a refined cereal diet with avoidance of wholegrain foods. They were then randomised into one of three intervention groups for 12 weeks: control (refined cereal diet); whole wheat diet (three 40g servings of whole wheat foods) or whole wheat and oats diet (one serving of whole wheat foods and two servings of oats).

The primary outcome measures of this study were total and low density lipoprotein (LDL) cholesterol. The study was powered to 90% on these two markers. LDL cholesterol is often referred to as ‘bad cholesterol’ because if it increases to a high level in the blood it can be deposited on the walls of the blood vessels and eventually leads to narrowing of the arteries that supply the heart with blood. Having high cholesterol levels increases the chances of developing heart disease. Blood pressure, lipoprotein profile, inflammatory markers, insulin resistance sensitivity and arterial stiffness were also measured at weeks 1, 4, 10 and 16 weeks.

The study was completed by 206 individuals and participants showed good compliance with the wholegrain interventions suggesting they were practical and realistic for free-living individuals to achieve.

* The metabolic syndrome refers to a collection of cardiovascular disease risk factors, including high blood pressure, reduced high density lipoprotein (HDL) ('good') cholesterol levels, raised triglycerides, central obesity and glucose intolerance within an individual, underpinned by insulin resistance.
The key findings were:

- systolic blood pressure and pulse pressure significantly decreased in the wholegrain food groups compared with the control group
- systemic markers did not differ significantly after the interventions apart from total and LDL cholesterol concentrations, which decreased slightly in the refined group between weeks 4 and 16
- macronutrient intake did not change throughout the trial, except for non-starch polysaccharides (NSP), which increased in the wholegrain intervention groups to close to the dietary reference value of 18g/day
- micronutrient intakes changed to reflect the different composition of the wholegrain foods used and fortification of the refined cereals and white flour with specific vitamins

Randomised controlled trial to test the impact of increased consumption of wholegrain foods on cardiovascular disease risk (the WHOLEheart study)

Individuals aged 18 to 65 years, with a BMI greater than 25kg/m² and who were considered to have low habitual wholegrain (WG) food intakes (< 30g WG/day) were recruited across the two centres in Newcastle and Cambridge. The study was completed by 266 individuals. Subjects were randomised to one of three groups: control group (no dietary intervention); first intervention group (60g WG/day for 16 weeks); or second intervention group (60g WG/day for 8 weeks followed by 120g WG/day for 8 weeks). Wholegrain foods, such as brown rice, wholegrain breakfast cereals and wholemeal bread were provided pre-weighed and packaged, with labels indicating wholegrain portions in each packet to aid compliance.

A food frequency questionnaire was used to assess wholegrain intake. Self-reported intake of wholegrain foods was compared with the measured concentrations of mammalian lignans in blood and plasma samples, to assess the potential use of lignans as a biomarker of wholegrain intake. Blood pressure was measured and plasma was analysed for total cholesterol, low density lipoprotein (LDL) cholesterol, high density lipoprotein (HDL) cholesterol and triglycerides, insulin, glucose and further biochemical markers of inflammation and endothelial function.

At baseline, all subjects consumed <20g/day WG foods. This remained the same for the control group throughout the study and during the 12 month follow-up period. As expected the wholegrain intake increased in the two intervention groups.
The inclusion of wholegrain foods in the diet led to beneficial changes in nutrient intakes, especially of dietary fibre and many micronutrients.\textsuperscript{95,96} However, there were no significant changes in blood pressure, total or LDL cholesterol concentrations, insulin sensitivity or any of the other biomarkers of CVD risk tested.\textsuperscript{97}

Factors affecting acceptability, barriers and sustainability of incorporating wholegrains into the diet were also explored by conducting focus groups at 1, 6 and 12 months post intervention. These qualitative data provide a valuable insight into consumer acceptance of wholegrain foods and the factors (such as taste acceptability, dietary acceptability mediated by health beliefs, food experiences and motivation to improve health or weight management) that influence food choice at the individual and household level.

Taken together these studies gave mixed results. One suggested that consumption of three portions of wholegrain foods per day may reduce the risk of CVD via blood pressure reduction. However, the other study did not. Further research is needed in this area.

\textbf{Developments in peanut allergy research}

Uncertainty about the determinants of peanut sensitisation and allergy was reported in the Chief Scientist Annual Report 2008/09.\textsuperscript{17} Ongoing research funded as part of the LEAP (Learning Early about Peanut Allergy) study, aims to identify the effects of early exposure to peanuts on immune responses.\textsuperscript{98} In this randomised controlled study, children aged 4 to 10 months at high-risk of developing peanut allergy, will either eat peanut-containing snacks until the age of five, or will avoid eating peanut products. A series of diagnostic tests, questionnaires and clinical evaluations will be done during the five years to monitor whether the children develop peanut allergy or not. The Agency is funding mechanistic research that will analyse samples of blood taken at specific time points throughout this study, to identify specific markers that may be associated with the development of peanut allergy or tolerance.\textsuperscript{99} These data will be crucial in underpinning the clinical results of the trial and should help us to understand the processes in the developing immune system that lead to the acquisition of oral tolerance to peanut, to peanut sensitisation and to peanut allergy.

Alongside the LEAP study, the Agency is also funding a randomised controlled trial in the general infant population, to examine the effects on the development of food allergy of the early introduction of six commonly allergenic foods (cows’ milk, egg, peanut, sesame, fish and wheat) from three months of age, alongside continued breastfeeding. This study (Enquiring About Tolerance – EAT) is being funded collaboratively with the Medical Research Council (MRC) and Kings College London.

Progress is also being made in the science of whether, and how, it is possible to desensitise children who are already allergic to peanut. In February 2010 the results of an important pilot study funded by the Evelyn Trust\textsuperscript{100} were reported. They suggest
that children suffering from peanut allergy can be desensitised to peanuts by exposure
to gradually increasing amounts of peanut in carefully controlled settings. Four patients
took part in the initial research, and a further 18 children aged 7 to 17 are now
following the programme. All the original patients are now eating at least five peanuts
a day to help their body maintain its ability to tolerate the food. However this research
is still at an early, exploratory phase and a new trial is being funded by the Department
of Health’s National Institute of Health Research (NIHR) that involves more than 100
children aged 7 to 17, which promises to provide more definitive results.

The Agency recognises the importance of working in partnership with other funders
and stakeholders. As well as the EAT and LEAP studies described above, we have been
exploring other opportunities for collaborative food allergy research. The outcome of
an Agency and MRC workshop is described in Chapter 3.

**Organic food review**

The Agency recognises the role that organic food plays in providing choice for
consumers. People choose organic food for a variety of reasons, for example, concern
for the environment, animal welfare or as a way to reduce consumption of additives
or pesticide residues, although independent expert advice is clear that this is not a
food safety issue.

The global demand for organically produced food has increased in recent years although
UK sales slowed down in 2009 due to the economic downturn. The organic food
market in the UK was estimated to be worth over £2.1 billion in 2008. Fruit and
vegetables comprise the largest sector of organic foods in the UK, closely followed
by dairy products. The shift in demand among consumers from conventionally to
organically produced foodstuffs appears to have arisen at least in part from a belief that
organically produced foodstuffs are healthier and have a superior nutrient profile than
conventionally produced foodstuffs.

The Agency commissioned an independent systematic review of organic food, as part of
its commitment to keep under review emerging research on organic food, and to ensure
consumers are provided with the most up-to-date information. A systematic review is a
summary of research that uses explicit methods to perform a thorough literature search
and critical appraisal of individual studies to identify the valid and applicable evidence.

This study is the most scientifically rigorous and independent review of organic research
ever carried out in this area and was conducted within the standard systematic review
process. All peer-reviewed data published within a specified time period were
included. The reviews did not address contaminant content (such as herbicide, pesticide
and fungicide residues) of organically and conventionally produced foodstuffs or the
environmental impacts of organic and conventional agricultural practices.
The review reports were extensively peer-reviewed before publication (see the boxes below).

A systematic literature review of organically and conventionally produced foods

The review considered differences in nutrient levels and their significance in organically and conventionally produced foods. In the systematic review search process, 162 relevant articles were identified, these all had an English abstract and had been published in peer-reviewed journals from 1 January 1958 until 29 February 2008. A total of 3,558 comparisons of the content of nutrients and other substances in organically and conventionally produced foodstuffs were extracted for analysis.

Articles included in the review were assessed for study quality (satisfactory quality studies provided clear statements on material and nutrients analysed, laboratory and statistical methods and a clear definition of organic agricultural practices). One third of all studies (n=55) met the pre-defined satisfactory quality criteria.

Analysis was conducted on nutrients or nutrient groups for which numeric data were provided in at least 10 of the 137 crop studies identified by the review.

In the analysis, which included all studies (independent of quality):

- no evidence of a difference in content was detected between organically and conventionally produced crops for the following nutrients and other substances – vitamin C, calcium, phosphorus, potassium, total soluble solids, titratable acidity, copper, iron, nitrates, manganese, ash, specific proteins, sodium, plant non-digestible carbohydrates, β-carotene and sulphur

- significant differences in content between organically and conventionally produced crops were found for some minerals (nitrogen higher in conventional crops; magnesium and zinc higher in organic crops), phytochemicals (phenolic compounds and flavonoids higher in organic crops) and sugars (higher in organic crops)

In the analysis restricted to satisfactory quality studies:

- significant differences in content between organically and conventionally produced crops were found only in nitrogen content (higher in conventional crops), phosphorus (higher in organic crops) and titratable acidity (higher in organic crops)

Conclusions:

- no evidence of a difference in content of nutrients and other substances between organically and conventionally produced crops and livestock products was detected for the majority of nutrients assessed in this review

- the differences that were detected are biologically plausible and most likely relate to differences in crop or animal management and soil quality
These conclusions relate to the evidence available at the time of the review, which contained limitations in the design and in the comparability of studies. There is no good evidence that increased dietary intake of the nutrients identified in this review that were present in larger amounts in organically rather than in conventionally produced crops and livestock products, would be of benefit to individuals consuming a normal varied diet, and it is therefore unlikely that these differences are relevant to consumer health.

**Putative health effects of organically and conventionally produced foodstuffs**

This systematic review of the available published literature focused on the nutritional content of foodstuffs, and only outcomes of clear direct relevance to human health were included. Eleven relevant articles, published with an English abstract in peer-reviewed journals between 1 January 1958 and 15 September 2008 were identified. (Prior to publication the researchers updated the systematic review to include all relevant studies up to March 2010. Only one extra relevant article was identified.) Articles were assessed for study quality (satisfactory quality studies provided a clear definition of organic agricultural practices, and statements on the nature of the organic component of the foodstuff or diet under investigation, the type and method of measurement of health outcomes, and the statistical methods used). Only three of the relevant studies met the pre-defined satisfactory quality criteria.

The review identified a large degree of variability in the design of studies, the exposures tested and the outcomes measured, and this variability precluded any numeric meta-analysis of the reported results. The extremely limited nature of the evidence base, both in terms of the number and quality of studies was noted.

The review concluded that, from the limited and highly variable data available, there is currently no evidence of nutritional health benefits from consuming organic compared with conventionally produced foodstuffs.

Based on the conclusions of the review the Agency reaffirmed its position, that there are no important differences in the nutrition content, or any additional nutritionally related health benefits, of organic food when compared with conventionally produced food.

Systematic reviews are a powerful tool to examine the balance of evidence across the diversity of available studies and data in a given area. In the next year, the Agency’s General Advisory Committee on Science (GACS) will be reviewing this work to consider if there are any lessons to be learned from how the study was conducted and how the Agency carries out and communicates studies of this kind in the future, particularly in contentious areas.
Using science to underpin our activities

In this section we describe two areas where the Agency has issued advice during 2009/10 based on the evaluation of our evidence by independent experts.

Evaluation of front-of-pack nutrition labelling

Front-of-pack (FOP) nutrition labelling is part of a package of Government initiatives that contribute towards efforts to tackle obesity and diet-related illnesses (see Chapter 1).47

The variety of different FOP nutrition labels currently used in the UK marketplace is confusing for shoppers. The four main types of FOP labelling in use are:

- traffic lights (with or without high, medium or low accompanying text)
- traffic lights (with or without high, medium or low accompanying text) and percentage of Guideline Daily Amount (% GDA)
- % GDA with pastel colours to highlight the nutrient rather than level of nutrient
- % GDA presented in a monochrome colour

Following extensive consumer research, in 2006 the Agency recommended businesses adopt a principle based approach to the voluntary provision of FOP nutrition labelling, which included use of traffic light colours to help interpret nutrient levels.107 At the same time the Agency committed to review the effectiveness of the main FOP labelling schemes in the UK market, and the objective was agreed by a high-level Nutrition Strategy Steering Group (NSSG), to evaluate the impact of FOP nutrition labelling schemes on purchasing behaviour and consumer knowledge.108 The evaluation was managed independently by an expert panel, and involved an integrated programme of qualitative, observational and quantitative work.

Programme of work on front-of-pack (FOP) labelling

The qualitative research109 consisted of:

- Accompanied shops where researchers used a topic guide to explore with shoppers the decision-making process, with particular focus on how FOP labels are used in this context.
- In-store shopping bag audits gave an understanding of how people used FOP labels in retail environments. Participants were recruited as they finished their shopping, to ensure there was no observer effect on purchasing decisions.
- Shopping bag audits where researchers visited shoppers’ homes shortly after they had undertaken a shopping trip and used the items purchased, to discuss purchasing decisions, how FOP labels were used to make them, and whether and how the foods, and FOP labels, were to be used for meals in the days ahead.
The second element of this work focused on the nature of the effects of the co-existence of a range of FOP label formats on accurate interpretation of labels. In-depth interviews explored how people dealt with the information presented and was used as a starting point to discuss any problems caused by the use of multiple FOP labels in making product comparisons.

Insights from the qualitative and observational work were used to inform the design of the quantitative research, a representative random probability survey of 2,932 main shoppers in the UK.\textsuperscript{109} This set out to assess the efficacy of FOP labelling, by measuring experimentally the impact that would be feasible in a natural setting, but with measurement carried out under controlled rather than natural conditions, to isolate the impact of specific elements of FOP labels on objective (not perceived) understanding. The evidence and decisions behind the design of the quantitative phase is documented in the Scientific Rationale and Design.\textsuperscript{110}

Additional information was collected to allow exploration of the relationship between subjective and objective understanding and to provide a basis for comparison with earlier research.

An omnibus survey* (1,602 main shoppers) using a random location sampling approach was also conducted. This tested the specific hypothesis that it is more difficult to compare the healthiness of two products when a different FOP label type is used on each product, compared with making comparisons using the same type of label on both products.

**Conclusions**

- a single FOP scheme would be most helpful for shoppers, as the use of different types of FOP labelling causes shoppers difficulties in using them
- the strongest FOP label combines use of the words ‘high, medium, and low’, traffic light colours and % GDA, in addition to levels of nutrients (in grams) in a portion of the product
- shoppers who use FOP labels value them; they use them particularly if they are shopping for children, if they have a particular health concern (e.g. high blood pressure or diabetes), or if watching their weight
- there is a generally high level of understanding of FOP labels, even among those who do not tend to use them, which suggests that raising awareness of a single scheme could encourage increased use of FOP labels

* The omnibus survey is run each week, with different clients placing questions on to a common questionnaire.
A full stakeholder consultation on the practical issues that need to be resolved for a single approach to FOP nutrition labelling to work in real-life settings and to help consumers make healthier choices closed in November 2009.\textsuperscript{111}

A series of citizens’ forums, which allowed a nationwide dialogue with the public, provided support for a single FOP labelling approach that could be widely understood by consumers.\textsuperscript{112} Consumers particularly liked a single FOP label that included traffic light colours, which aided quick decisions.

Following discussions at its March 2010 meeting, the Agency’s Board agreed a new framework for a single approach to FOP labelling in the UK.\textsuperscript{113}

FOP nutrition labelling is one of the issues contained within the Commission proposal for an EU Food Information Regulation (FIR). EU negotiations are unlikely to conclude before the end of 2011.

\textbf{Development of a nutrient profiling model}

The nutrient profiling model was developed by the Agency to provide Ofcom, the broadcast regulator, with a tool to differentiate foods on the basis of their nutritional composition, to seek to improve the balance of foods being advertised on the television to children.

The nutrient profiling model\textsuperscript{114} uses a simple scoring system that recognises the contribution made by beneficial nutrients that are particularly important in children’s diets (fruit, vegetables, nuts, fibre and protein – a marker for iron, calcium and n-3 fatty acids) and penalises food with components that children should eat less of (energy, saturated fats, salt, and sugars). The model allocates points on the basis of the nutrient content of 100g of a food or drink.

A panel of nutrition and public health experts assessed the effectiveness of the nutrient profiling model at differentiating foods on the basis of their nutrient composition (see the box).
The independent review panel’s advice on the nutrient profiling model

The panel commissioned a literature review on the latest scientific developments in nutrient profiling, consulted stakeholders, held a workshop and sought the views of the Scientific Advisory Committee on Nutrition (SACN) on its draft recommendations.

Four issues were considered:

• whether the nutrient profiling model should be based on portion size rather than 100g, in view of concerns that some food categories eaten in small portions were being unfairly penalised

• whether the nutrient profiling model should include specific food categories (such as cheese) with more lenient thresholds in order to recognise their contribution to a balanced diet

• how the nutrient profiling model should be applied to advertisements featuring recipes and serving suggestions in a way that does not discourage the promotion of home cooking

• whether the protein cap, incorporated into the model as a safeguard to mitigate against processed foods high in fat, salt or sugar being classified as ‘healthier’ by virtue of their protein content, was warranted

The review panel concluded that the model is scientifically robust and fit for purpose. It recommended the removal of the protein cap. SACN expressed reservations about the public health implications associated with removal of the protein cap, and that if this modification was made, the impact would need to be carefully monitored.

In March 2009, the Agency’s Board considered these views, and the likely impact of such a change on the work to improve children’s health and industry reformulation plans.115 It agreed that its priority was to support public health improvements and provide certainty to businesses, and therefore the protein cap should not be removed. Removing the protein cap would have allowed a limited number of additional products, including some sugary breakfast cereals and some crisps, to be advertised on television to children.

Ministers supported the Agency’s advice that the nutrient profiling model should continue to be used and the Agency has subsequently advised Ofcom of this.
Nutrition research review
The Agency carries out mid-term and post-programme evaluations, which amongst other things assess the extent that research supports policy. An external strategic review was conducted on the Agency’s nutrition research and survey portfolio in 2009 (see the box).

Outcome of the review of the Agency’s nutrition research and surveys portfolio

Recommendations about the content of the nutrition portfolio and the balance between different areas of research were developed.

The main recommendations include:

- the National Diet and Nutrition Survey (NDNS) was considered to provide essential information on the dietary intake and nutritional status of the UK population, which underpins work across the Agency and is also used extensively by others within the UK and internationally
- work should focus on major diet-related public health issues that are relevant to the UK population
- there is an urgent need to identify effective interventions to promote behaviour change in different groups and settings, particularly nutritionally vulnerable groups such as young adults

You can find out more about the Agency’s current research programmes on the Agency’s website at food.gov.uk/science/research/
The Agency’s reputation as an organisation based on science and evidence depends on having a robust and credible programme for gathering and using the information we need.

Our aim is to:

- bring together evidence and expertise across the natural and social sciences
- deliver our science work using multi-disciplinary teams within the Agency and with our partners
- give proper emphasis to gathering and using existing evidence, translating evidence into actions, and evaluating progress and impacts of our work, as well as commissioning new evidence

Our governance process

The Government Office for Science review

The recommendations of the Government Office for Science review of the Agency’s scientific performance together with the Agency’s response were published in the Chief Scientist Annual Report 2008/09. In most cases work to implement the recommendations is already underway and in some cases is complete. We will review progress formally with the Government Office for Science later in 2010 and report this separately.

An important piece of work over the last year has been the development of a new Science and Evidence Strategy in parallel with the Strategic Plan 2010–2015.

Gaining evidence

Commissioning research is one means of gaining evidence and the Agency has a strong track record here. Two key innovations for the coming year, outlined in our Science and Evidence Strategy, are:

- a broader definition of evidence – to make sure we bring together all the relevant expertise and evidence needs to meet the challenges we face (see Box)
- to use the broader definition of evidence to conduct strategic prioritisation of our evidence needs across all our work, so we can identify the best package of work

We will make sure all our evidence is subject to consistent procedures for procurement, quality assurance and review.
What we mean by evidence

Evidence means robust, reliable information that can be used to make well-informed decisions about our policies and advice, and evaluate their impact. It includes:

- collecting of new data and information (quantitative and qualitative), including carrying out investigative research to describe phenomena and understand their underlying causes and mechanisms
- monitoring and surveillance
- analysing and modelling existing statistical, economic or other data (including qualitative information), including to identify gaps
- reviewing and synthesising knowledge from existing research, stakeholder consultations and expert knowledge, including advice from independent expert advisors
- evaluating previous, current or prospective new policies

A new prioritisation process has been introduced to ensure that the work we commission is essential to our strategic aims and help ensure the best combination of work across all our objectives (see diagram on the next page). Our evidence needs are prioritised with the aid of tools and analysis developed with our Operational Research team. Money is allocated on the basis of bids prioritised according to a common framework.

We are increasingly working with other funders (both in the UK and internationally) to co-fund work so that we maximise the impact of the Agency’s spend (see the section on partnerships later in this chapter). Taken together, these initiatives might mean that in future we are able to make more effective use of our money.

We will ensure proper consideration is given to:

- horizon scanning
- gathering and using existing evidence
- analysis and interpretation
- translating evidence into actions
- evaluating impacts

A key part of this will be making better use of existing data both by increasing awareness and by systematic analysis and review.
The evidence prioritisation process

**Strategic Plan and Science and Evidence Strategy**
Set overall strategic objectives and priorities
*Board and Chief Scientist drawing on external inputs and advice*

**New science and evidence needs** – projects and supporting activities
*Agency teams drawing on external data and expert advice*

**Bids for new work** using common framework, covering:
- cost of target issue in health and economic terms
- size, type and timescale of impact
- likelihood of success
- scope for co-funding
- level of public concern
- statutory or other commitment to do work
- cost of project
*Agency teams, supported by OR and CST*

**Analysis of bids**
- provisional ranking
- sense check for gaps, balance of work, opportunities to join up, and important cross-cutting or strategic work not reflected well by the framework
- recommendation to Evidence Priorities Board
*OR and CST, input from SSRU and from FSAS, FSAW, FSANI*

**Evidence Priorities Board**
Decides strategic priorities for the next one or two years, reserve list and rationale.
*Chief Scientist and senior leaders across Agency*

**Forward evidence plan**
Main evidence needs for the next one to two years, published for comment on:
- where the data exist already
- opportunities for partnership
- how to define requirements better

**Detailed requirements for new work**
*Commissioned by open competition*

**Review progress** and results from our own work and outside
*Agency teams, external advice, support from OR and CST*

**Annual cycle of strategic evidence prioritisation**
To refresh overall needs, analysis and evidence plan

**Regular review**
Status of priorities and reserves. Any new evidence needs: unforeseen developments, new threats and opportunities

**Key:**
- OR: Operational Research team
- CST: Chief Scientist Team
- SSRU: Social Science Research Unit
- FSAS: FSA Scotland
- FSAW: FSA Wales
- FSANI: FSA Northern Ireland

*Commissioned in accordance with Public Sector Procurement procedures*
The forward evidence plan

The evidence plan will be refreshed annually and the Science and Evidence Strategy will be reviewed and amended regularly in light of developments. The outputs will inform the review and revision of our strategic priorities.

The evidence plan will:

- inform the Agency’s stakeholders and help identify whether they are aware of any work either completed or on-going in these areas, which we should take into account to help us focus our final requirements before issue
- be drawn to the attention of other funders to see if there are areas on which we could work more collaboratively on these or future needs
- provide early notice of possible tender opportunities to potential contractors, to stimulate interest

Quality assurance and review

The Agency already has mechanisms to ensure that it funds high quality work, for example, the Joint Code of Practice on Research. However, we are changing our research commissioning process to ensure a greater degree of challenge at the stage of development of funding proposals. The aim is to ensure that we ask the right questions and have an understanding of the best ways to answer them. We will also be exploring ways to improve external challenge to project proposals.

The Agency’s Social Science Research Unit has been developing new procurement procedures so that our social science research is treated in the same way as our other scientific evidence gathering and is compliant with EU legislation and the Office of Government Commerce guidelines. In the future social science research will be procured through a combination of collaborations with research funders such as the Economic and Social Research Council, our own research Frameworks, other Government department frameworks (including COI), limited tender exercises and informal competition.

One of the recommendations in the Government Office for Science review called for routine post programme evaluation of our research. The research programmes bring together related projects addressing different aspects of an issue. Our current system of research management contains an element of evaluation, both for individual projects and for programmes. Mid-term programme reviews and post-programme evaluations involve a rigorous assessment to determine the extent to which the research has been used to support policy. For example, there was a nutrition programme review last year (see Chapter 2).

During 2010/11 we will be refining the peer review process and external commentary on new evidence requirements, research proposals, and completed work.
Performance indicators

One of the priority actions set out in the new Science and Evidence Strategy focuses on appraisal and evaluation. This includes:

- appraisal of projects and policies before they start, to make sure they are based on robust assessment of the expected risks, benefits and impacts of different approaches
- evaluation of completed science projects and implemented policies to determine quality, success and impact

The Agency has adopted two sets of performance indicators (PIs) developed by the General Advisory Committee for Science (GACS) to:

- evaluate the quality, use and impact of the Agency’s science
- monitor the Agency’s research management, for internal use

Monitoring and evaluation of the scientific advisory committees (SACs)

We are committed to carry out quinquennial reviews of the SACs that advise the Agency. The reviews will help to ensure that we continue to receive independent scientific expert advice of the highest quality in the areas where it is needed.

All SACs with a secretariat led by the Agency will be externally reviewed over the next four years to assess:

- whether there is a continuing need for the committee
- its role, methods of operation and effectiveness, including its terms of reference and composition of members
- the openness and transparency of its procedures
- the relationships between the committee, the commissioning department and other bodies with related responsibilities, in particular the other SACs that advise the Agency
- the implementation of the recommendations of the Agency’s 2002 Review of the SACs, the revised code of practice for SACs and the current governance structure

The first review in this programme was of the Advisory Committee on Animal Feedingstuffs (ACAF) (see the box).
The review of the Advisory Committee on Animal Feedingstuffs (ACAF)¹²³

ACAF advises the Agency and agricultural Ministers throughout the UK on the safety and use of animal feeds and feeding practices, with particular emphasis on protecting human health and with reference to new technical developments and new feed materials.

Key recommendations from the review:

- there is a continuing need for ACAF, it provides valuable advice to the FSA, UK agriculture departments and directorates and stakeholders, but it is important that ACAF maximises the value that it contributes and continues to provide evidence of its value
- the role of ACAF, within its overall remit, has evolved over time and clarification of the current role would be beneficial
- the Chair and secretariat routinely confirm at meetings that issues being considered by ACAF are within its remit, which is an example of good practice and should be continued
- the exact remit with regard to animal health and welfare should be clarified and formal action taken and recorded in the minutes of the meetings with regard to appropriate liaison with UK agriculture departments and directorates on animal welfare issues

The review also made three recommendations on cross-cutting issues. The Agency:

- needs to ensure that the risk management advice it asks the committee for does not go beyond advice on risk management options put to them by the Secretariat
- should have internal procedures in place to ensure that any differences of opinion between its own policy units with regard to risk management are handled appropriately
- should consider an alternative approach to the assessment of committee members and introduce an appropriate method of assessing the performance of the Chair

The Agency’s Chief Scientist will develop a response to the review, drawing on views from ACAF and GACS, for consideration by the Board later in 2010.

We are also introducing a consistent approach to the assessment of the performance of committee Chairs and members. They will be assessed annually to provide evidence on their performance, give members feedback and recognise their contribution to the Agency, and allow members to provide feedback to the Agency.
The people who provide scientific advice to the Agency

In-house expertise

The Agency continues to develop the knowledge, skills and capacities that we need, across the natural and social sciences, to deliver our science and evidence objectives. We recognise the need to develop our in-house capabilities in core areas (including toxicology, nutrition science, microbiology, environmental health, veterinary science, economics, social science, operational research and statistics). This is supported by our internal Heads of Profession, wider professional groups, and continuing professional development (CPD) for all relevant professions in the Agency.

Continuing professional development

The continuing professional development (CPD) schemes available to the Agency’s scientists were described in the Chief Scientist Annual Report 2008/09. After a successful pilot for the general scientist scheme, it has now been rolled out to all scientific staff. CPD provides staff with an opportunity to reflect on the experiences gained over the year and keep track of all their learning developments as a result of the challenges they face in their daily work.

Our scientists are also encouraged to achieve Chartered Scientist status (CSci). This is a relatively recent award from the Science Council and is not as well established as chartered status for other professions such as engineers, accountants and surveyors. However, it is rapidly gaining in reputation and recognition as the gold standard across government, academia, industry, professional bodies and learned societies. The CSci reflects best practice in science and is set at a benchmark level throughout the science professions. One of our chartered scientists describes what inspired him to achieve this status (see the box).
Dr Andrew Damant describes what motivated him to seek CSci status

I am, by training, a food scientist/chemist and it therefore seemed appropriate for me to become a member of the Institute of Food Science and Technology (IFST) and to seek CSci status. I also consider that obtaining and maintaining third party recognition for my scientific capability and knowledge is a good way to generate external challenge and support for the science I use in my day-to-day work for the Agency. My current area of expertise is methods of analysis and scientific data quality, but as my career in the Agency progresses, maintaining my CSci status is a good way to keep a track of my personal development and all the work I put in across the range of scientific skills.

Gathering together evidence of continuing professional development (CPD) when applying for CSci status soon became a natural part of my daily working life and I have developed a proactive approach to maintaining evidence of CPD. It has definitely helped me in my career development and performance appraisal.

Maintaining my CSci status is particularly relevant to the Agency and the work I undertake in Europe and internationally. The Agency benefits from the scientific reputation I am building, which is supported by the fact that I am ensuring that I am always progressing my knowledge and science. The Agency is primarily committed to the public interest and consumers always come first. I think it is important for all Agency scientists to take a proactive approach to their development, and demonstrate that they are doing this. After all, we are working in the public interest and dealing with the evidence on which policy is based, and advice is issued.

The Agency’s Analysis and Research Division (ARD)

ARD is a key cross-Agency function that provides a wide spectrum of techniques to describe, understand, appraise, evaluate and inform policies and practice. Each of ARD’s analytical teams is a member of their respective government professional body* and we ensure that ARD staff are highly skilled and professional through:

* rigorous cross-government recruitment procedures
* adherence to competency frameworks specific to each profession
* CPD programmes (see section on CPD above)

ARD’s core objective is to ensure the entire policy making cycle in the Agency is underpinned by a rigorous and transparent evidence base. Each analytical profession has

a unique contribution to make as well as shared skills across the professions. They can be characterised as:

- **Economics**: ensuring that policy decisions are grounded in robust cost benefit analysis and understanding the macroeconomic environment and its interaction with policy
- **Operational Research**: using analysis (including scenario analysis and modelling) to support evidence based decision making for policy and strategy development and operational effectiveness
- **Scientific Data Quality**: providing internal and external stakeholders with advice on methods of analysis and scientific data
- **Social Science Research**: understanding behaviour change and the potential and actual social impacts of policy decisions/practice
- **Statistics**: advice on statistical robustness of scientific research, surveys and sampling activities and the exploitation and interpretation of Agency and others data

Good policy making is at the heart of delivering the Agency’s key outcomes, especially in a world of tighter resources where we need to deliver more with fewer resources. We use ARD’s skill set to aid understanding and decision making at all stages of the policy making cycle to ensure maximum benefit and impact.

**The scientific advisory committees (SACs)**

The Agency is advised by 10 SACs made up of about 150 independent experts.† A guide to the role of each of these committees and information on the committees that advise on pesticide and veterinary product residues in food are given in Annexe D.

The SACs are a source of independent information and expertise, one of their key functions being to carry out risk assessments for the Agency.

**The General Advisory Committee on Science (GACS)**

GACS provides independent advice on the Agency’s governance and use of science. It also helps to improve communication between the SACs that advise the Agency and it identifies and advises on cross-cutting issues that fall between or outside the remits of the individual SACs. GACS met twice during the past year (see the box).

† There will be some changes to the advisory committees which advise the Agency during the next year
Achievements of the General Advisory Committee on Science (GACS) during 2009/10

GACS has:

• helped the Agency develop its new Science and Evidence Strategy
• advised on the Agency’s response to the GO-Science Review and the Agency’s implementation plan
• coordinated a horizon scanning workshop on future food production with participants from across the SACs, other experts and other interested parties
• advised on the distinction between risk assessment and risk management and set up a working group to consider this issue further
• explored better coordination between SACs and engagement with each other in the early stages of work activities
• held a lay members event with GO-Science in November 2009
• advised on the Agency’s response to a Government consultation on the use of scientific analysis in policy making (see below)
• commented on the outcome of the review of ACAF and the Agency’s proposed response
• set up a working group to look at the use of data from other sources outside the published literature

The Social Science Research Committee (SSRC)

The SSRC\textsuperscript{125} provides the Agency with social science expertise and challenge. It provides advice on how social science can best contribute to achieving the objectives of the Agency’s strategic plan (see the box).
Achievements of the Social Science Research Committee (SSRC) during 2009/10

The SSRC:

• has responded to a consultation on the Agency’s draft Strategic Plan 2010–2015
• has responded to the consultation on the Agency’s nutrition research programmes
• has made recommendations for future research to the Advisory Committee on the Microbiological Safety of Food (ACMSF) based on its working group’s advice on Listeria in the over 60s
• has helped develop the questionnaire for the Agency’s new Food Issues Survey
• has advised on the Agency’s proposed research work on food hygiene behaviours and food safety cultures (see Chapter 2)
• was consulted on the public dialogue on GM foods that the Agency was asked to lead on behalf of the Government

The Committee on Toxicity (COT)

The COT provides advice to the Agency, the UK Departments and Directorates of Health and other government departments and agencies, on the toxicity of chemicals and related issues. It met seven times during the past year.

A COT workshop was held in February 2010 to explore ways in which the committee might evaluate and express uncertainty more effectively when carrying out and reporting risk assessments. The framework will enable the COT, and other committees that perform toxicological evaluations, to improve communication with regards to the sources of uncertainty in their risk assessments (see the box).
Committee on Toxicity (COT) workshop on uncertainty

A proposed framework was tested using four recent COT statements as examples. The committee concluded:

- There was support for a tiered approach with most detailed consideration where uncertainties could impact critically on the decisions that would follow from a risk assessment.
- Different approaches are needed for the expression of uncertainty, according to whether questions are qualitative or quantitative.
- In describing uncertainties in qualitative assessments, it is best to avoid the use of numbers, which are difficult to specify and liable to misinterpretation. However, it should be clear which lines of evidence weighed most heavily in coming to conclusions, and what, if any, are the major sources of uncertainty. The wording that is used to express levels of uncertainty should where possible be standardised.
- The best way of expressing uncertainty for quantitative estimates of parameters, such as risk, may vary according to the question that is being addressed. For example, one question might relate to an extensive database, and require a tight answer (perhaps to within ± 50% or less). In these circumstances, it may be helpful to specify a numerical credibility interval. For another question, decisions might hinge on accuracy only to within an order of magnitude, and uncertainties might best be expressed in less precise language.

The framework will be revised and the COT will test it prospectively on a new statement. The Chair of the COT discussed the framework at the GACS meeting in March 2010. He will report back on progress so that GACS can consider its wider application.
Principles on scientific advice to Government

The role of SACs and how they should relate to the Government was widely debated, following events involving the Advisory Council on the Misuse of Drugs (ACMD) in November 2009.129

The Government’s Chief Scientific Adviser, Professor John Beddington, took a leading role in these discussions, working with departmental Chief Scientists and SAC Chairs, among others. He published draft high-level principles for scientific advice to the Government for comment, as part of a consultation on an update to the ‘Guidelines for the use of scientific analysis in policy making’.130 The revised set of principles drawing on the consultation responses aims to ensure effective engagement between the Government and those who provide independent science and engineering advice, and to clarify the roles and responsibilities of those providing advice and those making decisions.

The Agency is committed to the robust and proper use of independent scientific advice in its decision making and we welcome publication of the principles. The Agency responded to the consultation, drawing on the views of GACS. The updated guidelines and the responses to the consultation have now been published.131

Working with the wider scientific community

Partnerships

The Agency recognises the need to:

- work in partnership with other funders and stakeholders to ensure coherent approaches, avoid gaps and duplication, and exploit opportunities to do things better by working together
- collaborate effectively across the Agency

We will develop partnership in the UK, EU and beyond, to identify, share and analyse data, identify and respond to opportunities for strategic collaboration, and develop effective responses (see the box).
Key partnerships

We are working with Other government departments and funders to make sure that:

Our work is coordinated with relevant work by others, reflecting the vision for safe, healthy, sustainable food set out in Food 2030, and the previous Government’s UK Cross-Government Strategy for Joint Food Research and Innovation. Key areas include: food security and sustainability, in the face of climate change; diet, lifestyle and health; and wider work on public health, behaviour change and education.

Relevant long-term, underpinning science and skills are supported in key areas, including:

- The underlying nature, mechanisms and development of risks from pathogens, chemicals and allergens in foods, and to underpin effective risk assessment. We have developed a strategic, cross-funder approach on research to control Campylobacter with Defra, the Biotechnology and Biological Sciences Research Council (BBSRC) and others. We are pleased to report that work to deliver that strategy is already underway (see Chapter 1).

- Understanding the relationships between diet and health and the underlying mechanisms and the factors that influence them.

- Biomarkers in relation to diet and cancer, and other food-related risks.

- Understanding food behaviours in the context of wider behavioural and social science research, including descriptive and theoretical work on potential barriers to behaviour change, to complement the Agency’s work on testing interventions. In particular, we will continue to develop our strategic partnership research with the Economic and Social Science Research Council (ESRC) on why people eat what they eat.

- Better understanding from the economic and social sciences of what influences effective regulation and safe or unsafe behaviours by operators, regulators and consumers; and on the underlying nature, mechanisms and development of risks from pathogens, chemicals and allergens in foods, and to inform effective risk assessment.

- In Scotland the Agency is a member of the CAMERAS board, whose agenda is to ensure that Scottish marine, environment and rural affairs science is coordinated and targeted correctly. It promotes co-operation and partnership working amongst its members and other key partners.

Enforcement, monitoring and industry partners to make sure:

- That informal and enforcement data, as well as qualitative information, are gathered and used effectively to inform our work, and that the results of analysis are translated effectively to inform planning and future enforcement and control activities.
• Monitoring data collected by ourselves or by partners provide maximum value to the Agency and to others.
• We build a common understanding and evidence base for new controls, and translate results effectively to deliver reductions in food-related ill-health in practice.

EU and international funders, regulators and risk assessors, including the European Food Safety Authority (EFSA) and the EU Framework Programmes for research.

We lead the European Salt Action Network, which shares best practice in a network of countries from the European region of the World Health Organization (WHO), working on salt reduction.

Government professional networks in economics, social research, operational research, and developing partnerships with the learned and professional societies.

Charitable, not-for-profit and industry partners, to make sure we coordinate and share data and resources effectively where this helps us to deliver better evidence and outcomes.
Collaborative work on food allergy

In September 2009, the Medical Research Council (MRC) and the Agency instigated a new collaboration to jointly host a scientific workshop to discuss how to promote greater integration between the fields of immunology and food allergy research and to identify the most pressing scientific challenges to be addressed (see the box).

Agency and MRC workshop on food allergy research

The Agency and the MRC have shared interests in the field of food allergy research, particularly in relation to delivering public health and consumer benefits through the funding of high quality research focused on improving our understanding of the causes and mechanisms of food allergic disease.

The workshop resulted in some very positive engagement from leading UK scientists who attended. The Agency and MRC have been considering the various recommendations and outcomes that emerged, to see if there are specific ways in which our organisations could collaborate further to address some of the research areas and more generally to support closer integration between the different fields of research allied to food allergy. Following these discussions, our intentions are to publish a joint MRC/FSA research highlight note on the MRC website, inviting research proposals to address identified knowledge gaps that will inform public health policy.

National Reference Laboratories (NRLs)

The UK NRL network is responsible for setting up EU standards for routine procedures and reliable testing methods in the areas of feed, food and animal health. Core functions of the appointed UK NRLs are effectively those cited in Article 33 of the EC Regulation 882/2004 on the official feed, food, animal health and animal welfare controls.134

In order to provide technical and scientific support for the official control framework, the European Commission has created a network of ‘European Union Reference Laboratories’ (EU-RLs). Individual EU member states designate one or more NRLs for each EU-RL. Responsibility for the UK NRLs in food and feed is held by the relevant departments/groups within the Agency and Defra.

The Agency works closely with the four UK Departments and Directorates of Agriculture/ Rural Affairs to ensure activities that will help to safeguard public, animal and plant health, to protect consumers and to promote animal welfare are co-ordinated. The Agency works with these other government departments and directorates to prepare the National Control Plan (NCP).135 The principal objectives of the NCP are to ensure that European Community law on feed and food, on animal health and animal welfare, and on plant health is implemented in the UK and that there are effective official control systems in place for monitoring compliance and for enforcing the various rules.
Details of the NRLs that have been designated in the UK are provided in an appendix to the NCP. For example, the Food and Environment Research Agency (Fera) was appointed as the NRL for the UK, from April 2008\textsuperscript{136} for four years, for the following food contaminants: mycotoxins, heavy metals, dioxins (PCDD/Fs) and polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and materials and articles in contact with food. Fera was also appointed as the NRL for dioxins and PCBs in feed in March 2009\textsuperscript{136} and LGC was appointed as the UK’s NRL for genetically modified (GM) food and feed in March 2009.\textsuperscript{137}

The postgraduate scholarship scheme
We currently run a postgraduate scholarship scheme\textsuperscript{138} aimed at training postgraduates in areas of strategic interest to the Agency. During the next year we will review our needs for strategic skills support and the best mechanisms to deliver these.

Working in Europe
The Agency represents the UK Government on food safety and standards issues in the European Union (EU). We share our knowledge and expertise with other member states and work with them to improve food safety within the EU.

We engage with and seek to influence other expert bodies that carry out or help shape scientific assessment and regulation, including the European Food Safety Authority (EFSA) and other international bodies.

We also work with Defra, BBSRC and others to provide effective UK input into the EU research programmes relating to food, to help ensure that the priorities and execution of the EU research programmes reflect our priorities, and to develop opportunities for co-funding and partnership.

European Food Safety Authority (EFSA)
EFSA was formally set up in 2002 as an independent source of scientific advice on existing and emerging risks associated with the food chain. In Europe risk assessment is separate from risk management. As the risk assessor, EFSA produces scientific opinions and advice to provide a foundation for European policies and legislation and to support the European Commission, European Parliament and EU member states. EFSA works in close collaboration with national authorities and in open consultation with its stakeholders.

EFSA’s remit covers food and feed safety, nutrition, animal health and welfare, plant protection and plant health.

EFSA Focal Points
Each member state has nominated an individual to act as a Focal Point to provide contact between EFSA and the different national food safety authorities, research institutes, consumers and other EFSA-related stakeholders (see the box).
Alisdair Wotherspoon, head of science delivery, explains his EFSA Focal Point role

As the UK Focal Point, my main role is to ensure good flows of information between EFSA and the Agency and other UK Government bodies who are responsible for areas falling within the EFSA remit. The role also involves trying to ensure EFSA has access to the right expertise in the many areas in which it seeks input.

A key objective for the Focal Point is to support the Agency’s member of the EFSA Advisory Forum, to help promote stronger networking and cooperation. This includes ensuring the exchange of scientific information between EFSA and the relevant departments in the UK. I also provide advice and help facilitate developments on joint projects, such as the EFSA database of experts and the list of competent organisations capable of assisting EFSA with its tasks (article 36 list).

The network is very active, meeting three times a year face to face and with often daily contacts by email/telephone. It has proved a very useful adjunct to the cooperation mechanisms put in place by EFSA. It has also helped in establishing better working level contacts between Agency colleagues and their opposite numbers in other food safety authorities.

We highlight certain EFSA activities on the Agency’s website.

EFSA Advisory Forum

The national bodies responsible for risk assessment in each of the EU member states advise EFSA on scientific matters, work programmes and priorities through the Advisory Forum, and they use the Forum to identify emerging issues as early as possible. The Agency’s Chief Scientist is the UK’s member of the Advisory Forum.

EFSA’s Scientific Committee and Panels

EFSA’s Scientific Committee and Panels carry out EFSA’s scientific risk assessment work. The Scientific Committee supports the work of the Scientific Panels on scientific matters of a horizontal nature and it provides strategic advice to EFSA’s Executive Director. It is also responsible for general coordination to ensure consistency in the scientific opinions prepared by the Scientific Panels.

The Committee and Panels are made up of independent scientific experts from across Europe and are appointed through a rigorous open selection process to address all aspects of EFSA’s remit. The following Agency staff are members of EFSA’s Panels:

Dr Diane Benford is vice-Chair of the CONTAM Panel, which deals with contaminants in the food chain.
Derek Renshaw is a member of the FEEDAP Panel, which deals with additives and products or substances used in animal feed.

Dr David Gott is a member of the ANS Panel, which deals with questions of safety in the use of food additives, nutrient sources and other substances deliberately added to food, excluding flavourings and enzymes.

There are also a number of Agency staff who are invited experts on working groups and task forces that EFSA has set up.

Diane Benford reflects on her role on the CONTAM Panel

The CONTAM Panel meets in Parma five times a year, and members of the Panel are also expected to participate in working groups. Over the past year I have participated in CONTAM working groups on melamine (as Chair), arsenic and shellfish biotoxins and also on the working group on risk benefit assessment of the EFSA Scientific Committee. The topics discussed in the working groups and Panel are all important for the Agency, in dealing with incidents, responding to concerns of consumers or (via the Communications Division) media and in policy, such as development of new EU regulations.

Involvement in EFSA risk assessments helps me and my team in the Chemical Risk Assessment Unit to be familiar with the issues as they arise, without requiring extensive research. I am also able to influence the development of a Panel opinion, for example with respect to transparency in the risk assessment. In addition, Panel membership offers the opportunity to make valuable contacts with food chemical risk assessors in other European countries.

Knowledge transfer

The Agency’s Social Science Research Unit now follows the guidance on the publication and release of research projects produced by the professional body of the Government Social Research (GSR) service. The principles apply to all government departments and devolved administrations that conduct or commission social science research. Although they are aimed at the publication of social science outputs, they outline basic good practice and therefore also apply to other research outputs (see the box). However, we are aware that there may be mitigating circumstances at times, such as publication issues with journals or issues surrounding intellectual property. We are currently considering how this will be dealt with.
GSR guidance: summary of the five principles

- the products of government social research will be made publicly available
- there will be prompt release of all government social research
- government social research must be released in a way that promotes public trust
- clear communication arrangements will be in place for all products
- responsibility for the release of government social research must be clear

Improved communication of local authority surveillance data

The review of the Agency’s science,\textsuperscript{79} published in 2009, noted that there was scope for improved communication and knowledge transfer, particularly with regard to the Agency’s collaborative efforts with others, including liaison with local authority (LA) trading standards departments. It suggested the Agency’s funded UK Food Surveillance System (UKFSS), which collects analytical data from LA and port health authority enforcement sampling into a centrally held database and can be used by the Agency to inform and influence future activity, including more targeted sampling by LAs, could provide more comprehensive and transparent surveillance information in relation to enforcement practices (see the box).

UK Food Surveillance System (UKFSS)

The UKFSS is a valuable tool for assisting the enforcement community in developing evidence-based food sampling programmes and for coordinating specific food-related surveys over time. In addition to enabling LAs to monitor the microbiological and chemical status of food business operator food sampling both under their own jurisdiction and across other regions, the database allows local, regional and national data sets to be compared. It provides the Agency with a means of identifying trends in food sampling (and levels of compliance) for food safety and standards across the UK.

The FSA commissioned Health Protection Scotland (HPS) to develop UKFSS and implement the system out across the UK to allow standardised data capture, storage, querying and reporting functionality for chemical and microbiological food and feed enforcement samples. UKFSS is operating fully in Northern Ireland,\textsuperscript{142} in 90\% of Scottish LAs and 10\% of LAs in England and Wales.\textsuperscript{143} The implementation across England and Wales will continue as the Health Protection Agency (HPA) and Public Health (PH) Wales laboratories come on board from September 2010 onwards for microbiological samples, and then the district councils and environmental health departments become fully integrated with UKFSS in 2011.
To make sure we learn from past incidents, the Agency reviews how it handles incidents so it can be as prepared as possible to anticipate and deal with emerging and re-emerging risks. We are developing a new work programme on emerging risks.

The Agency’s Board considered a number of core themes at its March 2010 meeting. The process is to identify data sources and to agree data sharing with data owners. This will involve the co-operation of the food industry, research institutions and enforcement authorities. The Agency is working with the European Food Safety Authority (EFSA) on a wider EU data sharing initiative. The data gathered will feed into an IT system that is able to make complex linkages and indicate the key areas for further assessment and analysis. A diagram of the process is shown below.

Emerging risks and horizon scanning proposal
Horizon scanning

The Agency’s General Advisory Committee on Science (GACS) has previously recognised the importance of horizon scanning as a mechanism for considering future scenarios and how to respond to them. In particular it is interested in exploring ways to support cross-boundary working on horizon scanning between the different scientific advisory committees (SACs) and feeding into the Agency’s strategic planning.

GACS hosted a horizon scanning workshop in June 2009 building on ideas emerging from previous discussion in two of the SACs, the Advisory Committee on Animal Feedingstuffs (ACAF) and the Scientific Advisory Committee on Nutrition (SACN) (see the box).

General Advisory Committee on Science (GACS) workshop – Future food production for healthier eating: opportunities and challenges

The workshop’s aims were to:

• Identify developments in primary food production, over a 10 to 20 year horizon, which could lead to ingredients and foods that could significantly support, or hinder the Agency objectives.

• Examine the reasons for these and identify actions that should be taken by the Agency, the SACs, or other funders, to facilitate or otherwise to respond to the potential developments.

A wide range of more fundamental underpinning issues were also identified that participants considered of importance to the overall aims.

The principal views from the workshop were that:

• There is a need to develop a better understanding of consumers’ behaviours: what they want from their food and what they will find acceptable. In particular, there is a need to have a better understanding of consumers’ perception of technological innovation, especially if this would result in healthier foods.

• There is a need for better coordinated delivery of public nutrition advice and one coherent set of evidence-based guidance on diet and health: a range of different messaging options, including the latest technology, should be used to inform the public and help them make the right choices.

• There is scope for consumers, either through their own self-interest or through policy/economic intervention, to improve their dietary balance within the range of foodstuffs that is available now and likely to continue to be available in the future.

• Where technological innovation is anticipated, such changes need not necessarily involve high-technology solutions.
• Suggested ways for future modification of the food supply include improving the nutritional quality of food through the growing medium, using feed modification in primary production, improved breeding strategies and the direct manipulation of foodstuffs to either introduce, increase or decrease particular individual components. These innovations could also be supported through policy/economic interventions.

• To address future managed changes in the food supply, it will be necessary to maintain or increase investment in research in this area, while engaging with research internationally and making full use of existing data.

The Agency uses horizon scanning to identify new issues, threats and opportunities through the SACs, projects and other activities, joining up across the Agency and across Government. ACAF and SACN have considered the outcomes of this event and will be picking up a number of the ideas generated for further consideration.

**The UK Cross-Government Strategy for Food Research and Innovation**

The previous Government published a UK Cross-Government Strategy for Food Research and Innovation\(^\text{133}\) in January 2010, which set out plans to maximise the contribution of research and innovation to meet its goals on food, providing stronger links between research activities across the public sector. It provides a framework to facilitate a more coordinated and collaborative approach between those public sector bodies involved in funding, commissioning and delivering research in the UK, linking with the private sector, consumer and other organisations wherever relevant.

This strategy links closely to the shared vision set out in Food 2030\(^\text{132}\) of a sustainable and secure food system. It addresses the many challenges faced in food production that are often complex, inter-connected and multi-faceted. It does not replace or replicate the Agency’s research strategy, but aims to draw more strongly on the links between different research funders and provide a framework for focusing on cross-cutting issues where collaboration is beneficial.

The strategy includes a multi-partner food security research programme, co-ordinated by the BBSRC (see the box). For more on partnerships, see Chapter 3.
Global food security

The Global food security programme\textsuperscript{146} was launched in March 2010. Its sponsors and partners include five UK research councils, the Department for Business, Innovation and Skills, the Department for Environment, Food and Rural Affairs, the Department for International Development, the Government Office for Science, the Scottish Government, the Technology Strategy Board and the Food Standards Agency.

The partners will work together to develop, co-design and implement a research programme, which is intended to help meet the challenge of providing the world’s growing population with a sustainable supply of safe, nutritious food, from less land and with lower inputs. Key to this will be the coordination of multidisciplinary research, from food production and processing to distribution, consumption, diet and health, and its effective translation into policy and practice.

There will be four themes:

- economic resilience (including trade and competitiveness)
- resource efficiency (including reducing inputs and improving efficiency)
- sustainable production (including crops, livestock and farm systems)
- sustainable, healthy, safe diets (including food safety and accessibility)

The Agency, together with the Medical Research Council, is leading on developing the sustainable, healthy, safe diets theme.

Foresight study

Foresight is a group within the Government Office for Science that examines scientific and other evidence to help the Government plan systematically and make policy decisions for the future. We will be considering the recommendations from the Foresight project on global food and farming futures in relation to our future work.\textsuperscript{147}

The project, which is due to launch its findings in October 2010, is developing case studies from around the world and will involve local experts to ensure that the work draws upon local understanding and perspectives. The case studies could provide a valuable resource for the Agency in the planning its future work.

Climate change

The Agency has funded a systematic review of the effect of climate change on food (see the box), which aims to identify the evidence we will need to continue to deliver strategic objectives to:

- continue to reduce foodborne disease
- reduce further the risks to consumers from chemical contamination of food
Climate change review*

The aims were to:

• identify the gaps in the Agency’s science and evidence base
• identify the key areas of work to be engaged with
• highlight relevant on-going work to ensure that we have an appropriate input and collaboration with other programmes of work and organisations
• identify the gaps in our science to aid the Agency in making best use of its resources and to best contribute to the growing body of evidence in the most constructive way

The report will be completed later in 2010 and will focus on three key areas of the Agency’s remit and policy:

• changes in microbiological, chemical and pesticide hazards at various stages of the food chain
• changes in the types of food that people choose to consume
• shifts in geographical areas from which food is sourced

Although not within the Agency’s remit, it will also consider mitigation of climate change through food choice and food waste.

The next stage will be to develop and implement a plan of work to address the findings.

Nanotechnology

Nanotechnology is essentially the creation or manipulation of materials at a sub-microscopic scale, often defined as in the range of 1 to 100 nanometres and it covers a very wide range of activities. It may offer a range of potential benefits to consumers and industry in the area of food and food contact materials, from improving the solubility and bioavailability of ingredients to extending the shelf-life of food. However, nanotechnology also raises a number of safety, environmental, ethical, policy and regulatory issues. Very few products have appeared on the UK market to date that have used nanotechnology.

In March 2009, the European Food Safety Authority (EFSA) published its opinion on the potential risks arising from nanoscience and nanotechnologies in food and feed.148 The EFSA Scientific Committee concluded that a case-by-case approach would be necessary and that current data limitations and a lack of validated test methodologies could make risk assessment of specific nano-products difficult and subject to a high degree of uncertainty.

In January 2010, the House of Lords Select Committee on Science and Technology published a report on the inquiry into nanotechnologies and food, which set out a total

*The report will be published on our open access repository foodbase at www.foodbase.org.uk following peer review
of 32 recommendations and conclusions. The Agency and other relevant bodies were called to give evidence. The Government’s response to the Committee’s report, which was coordinated by the Agency in collaboration with the Department for Business, Innovation and Skills (BIS) and Defra, was published in March 2010. The response highlights the key areas of work to be undertaken or that are already underway. The Agency has committed to taking forward relevant recommendations which include: setting up a special forum for those with an interest in nanotechnologies and food; setting up of a register of nano-foods on the UK market; and collecting information on food-related nanomaterials/products that are being researched by industry.

The UK Government strategy for nanotechnologies, published by BIS in March 2010, set out ways to promote the responsible development of nanotechnologies across all sectors, including food. The Government response to the Select Committee report is consistent with the UK strategy and it includes cross-references to actions set out in the strategy where these are relevant to the Committee’s recommendations.

One of our primary concerns is to understand and evaluate any possible risks arising from nano-foods. Experts at national and international level have identified gaps in our knowledge on the safety of nano-foods. To help to fill these gaps, the Agency has commissioned two research projects to look at the ways in which nanomaterials enter the human body and what happens to them once they are there. In addition, we are jointly funding a project being undertaken by an international consortium under the EU Framework 7 Programme with the European Commission, on the characterisation, detection and measurement of nanoparticles in food.

The Agency will be engaging with industry and others to inform the development of risk assessment and regulation of nano-foods. Nanotechnologies will also be part of the Agency’s programme of citizens forums for 2010.

If nanotechnology is used to develop novel foods and processes, approval would be required under the Novel Foods Regulation, EC No 258/97, to ensure products are safe. The Regulation is currently being amended to clarify that nanomaterials fall within its scope and to provide a definition of engineered nanomaterials. The Agency has been involved in negotiations with the Commission and member states on all aspects relating to the amended proposal.

**Reviewing our priorities**

Following the recent changes to the Agency’s responsibilities announced by the Government, we will be focusing on our core remit of food safety policy and enforcement.

Over the coming year we will also monitor developments in the areas discussed in this chapter to inform the review and revision of our strategic priorities as necessary.
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<td>BMI</td>
<td>Body mass index</td>
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<td>British Poultry Council</td>
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<td>CAMERAS</td>
<td>A Coordinated Agenda for Marine, Environment and Rural Affairs Science Boards</td>
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<td>Coronary heart disease</td>
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<td>Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment</td>
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<td>COI</td>
<td>Central Office of Information</td>
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<td>Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment</td>
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<td>CONTAM</td>
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<td>Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment</td>
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<td>CPD</td>
<td>Continuing professional development</td>
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<td>CVD</td>
<td>Cardiovascular disease</td>
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<td>Department of Agriculture and Rural Development in Northern Ireland</td>
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<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
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<td>DRV</td>
<td>Dietary reference value</td>
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<tr>
<td>EAR</td>
<td>Estimated average requirement for energy</td>
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<td>EAT study</td>
<td>Enquiring About Tolerance study</td>
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<td>European Free Trade Association</td>
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<td>European Prospective Investigation of Cancer</td>
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<td>European Union</td>
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<td>European Union Reference Laboratories</td>
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<td>Additives and Products or Substances in Animal Feed Panel (EFSA)</td>
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<td>Front-of-pack labelling</td>
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<td>General Advisory Committee on Science</td>
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<td>GDA</td>
<td>Guideline daily amount</td>
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<td>GPAs</td>
<td>Government Partnership Awards</td>
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<td>Acronym</td>
<td>Full Form</td>
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<td>Government Social Research Service</td>
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<td>High density lipoprotein</td>
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<td>Health Protection Scotland</td>
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<td>HPUs</td>
<td>Health Protection Units</td>
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<td>HVP</td>
<td>Hydrolysed vegetable protein</td>
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<td>IARC</td>
<td>International Association for Research on Cancer</td>
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<td>IFST</td>
<td>Institute of Food Science and Technology</td>
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<td>IID</td>
<td>Infectious Intestinal Disease</td>
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<tr>
<td>LC/MS/MS</td>
<td>Liquid chromatography tandem mass spectrometry</td>
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<td>LDL</td>
<td>Low density lipoprotein</td>
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<td>Learning Early about Peanut Allergy study</td>
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<td>LOC</td>
<td>Lab-on-a-chip system</td>
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<tr>
<td>3-MCPD</td>
<td>3-Monochloropropane-1,2-diol, or 3-Chloro-1,2-propanediol</td>
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<td>MLST</td>
<td>Multilocus sequence typing</td>
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<td>Medical Research Council</td>
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<td>NCP</td>
<td>National Control Plan</td>
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<td>NDNS</td>
<td>National Diet and Nutrition Survey</td>
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<td>NDNS RP</td>
<td>National Diet and Nutrition Survey Rolling Programme</td>
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<td>National Heart Forum</td>
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<td>Non-milk extrinsic sugar</td>
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<td>NRLs</td>
<td>National Reference Laboratories</td>
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<td>Polymerase chain reaction</td>
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<td>Perfluorooctanoic acid</td>
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<td>Perfluorooctane sulphonate</td>
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<td>Polytetrafluoroethylene</td>
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<td>Restriction fragment length polymorphism</td>
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<td>Transmissible Spongiform Encephalopathies</td>
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<td>UK Food Surveillance System</td>
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<td>World Health Organization</td>
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References

1. Food Standards Agency: Consumer attitudes survey
   food.gov.uk/science/socsci/surveys/foodsafety-nutrition-diet/
2. Food Standards Agency (March 2010): Quarterly public attitudes tracker
   food.gov.uk/science/socsci/surveys/publictrackingsurvey
   food.gov.uk/safereating/safcom/fdscg/
   food.gov.uk/science/researchpolicy/chiefsci/csreps/
5. The second infectious intestinal disease study
   www.gutfeelings.org.uk/
6. Advisory Committee on the Microbiological Safety of Food (March 2009): Minutes
   acmsf.food.gov.uk/acmsfmeets/acmsf2009/acmsf260309/acmsfmin260309
7. Advisory Committee on the Microbiological Safety of Food (September 2009): Minutes
   acmsf.food.gov.uk/acmsfmeets/acmsf2009/acmsf240909/acmsfmin240909
8. Food Standards Agency (2009): Dissemination of Food Standards Agency Scotland funded research on Campylobacter
   food.gov.uk/news/newarchive/2009/dec/campylobacter
   food.gov.uk/science/surveillance/fsisbranch2009/fsis0409
11. Advisory Committee on the Microbiological Safety of Food (March 2010): Paper ACM 977 Campylobacter workshop
    acmsf.food.gov.uk/acmsfmeets/acmsf2010/acmsf250310/acmsfagenda250310
12. UK research and innovation strategy for Campylobacter in the foodchain (2010)
    food.gov.uk/news/newarchive/2010/jul/campyresearch
13. Food Standards Agency: The Campylobacter risk management programme
    This will be published later in 2010 on food.gov.uk
14. Food Standards Agency (January 2010): Board paper FSA 10/01/03
    food.gov.uk/aboutus/ourboard/boardmeetings/boardmeetings2010/100126/agenda100126
Food Standards Agency: *International meeting on Campylobacter in chicken.*

Food Standards Agency: *Food safety week 2010*
food.gov.uk/safereating/hyg/germwatch/2010/

Food Standards Agency: *Annual Report of the Chief Scientist 2008/09*
food.gov.uk/science/researchpolicy/chiefsci/csreps/

Food Standards Agency: *Food safety week 2009*
food.gov.uk/safereating/hyg/germwatch/fsw09/

Advisory Committee on the Microbiological Safety of Food (September 2009): *Report on the increased incidence of Listeria in the UK*
food.gov.uk/news/newsarchive/2009/sep/acmsflisteria

Advisory Committee on the Microbiological Safety of Food (September 2009): *Paper ACM 954: Report of the Social Science Research Committee Working Group*
acmsf.food.gov.uk/acmsfmeets/acmsf2009/acmsf240909/acmsfagenda240909

Food Standards Agency: *UK-wide ‘scores on the doors’ steering group*
food.gov.uk/enforcement/enfcomm/scoresdoorssteeringgroup/

Food Standards Agency (2010): *Navigator report: Communications development research for a national food hygiene rating – scores on the doors – scheme*
food.gov.uk/enforcement/enfcomm/scoresdoorssteeringgroup/scoresdoorssteeringgroupmeetings/2010/sotdsg100617/sotdsg100617agenda

Food Standards Agency (2009): *Define Research and Insight: Scores on the doors national website – development research, final report*
food.gov.uk/multimedia/pdfs/sotdconsumerresearch09.pdf

Food Standards Agency (2010): *Food hygiene business campaign*
food.gov.uk/news/newsarchive/2010/jan/goodbusiness

Food Standards Agency (2009): *Survey of fluorinated chemicals in food*
food.gov.uk/science/surveillance/fsisbranch2009/fsis0509

Food Standards Agency (2009): *Survey of total and inorganic arsenic in rice drinks*
food.gov.uk/science/surveillance/fsisbranch2009/survey0209

Defra: Family Food (2008): *Datasets, UK purchases*

Food Standards Agency (2008): *Survey of process contaminants in retail food*
food.gov.uk/multimedia/pdfs/fsis0309acrylamide.pdf
29 European Commission Scientific Committee on Food (2001): *Opinion on 3-Monochloropropane-1,2-diol (3-MCPD)*
www.ec.europa.eu/food/fs/sc/scf/out91_en.pdf

30 Food Standards Agency (2010): *Annual report of incidents 2009*
food.gov.uk/news/newsarchive/2010/may/incidents

31 Food Standards Agency (2009): *Increase in Salmonella in eggs*
food.gov.uk/news/newsarchive/2009/nov/salminc

32 Food Standards Agency (2008): *Food incident involving the presence of dioxin in pork meat*
food.gov.uk/enforcement/alerts/2008/dec/irishporkupdate2

33 Food Standards Agency: *Incident response protocol*
food.gov.uk/foodindustry/incidents/respond/

34 Food Standards Agency: *National Diet and Nutrition Survey*
food.gov.uk/science/dietarysurveys/ndnsdocuments/

35 Food Standards Agency (2009): *Scientific consultation on energy requirements*
food.gov.uk/news/newsarchive/2009/nov/energy

36 Food Standards Agency: *National Diet and Nutrition Survey: headline results from year 1 (2008/09)*
food.gov.uk/science/dietarysurveys/ndnsdocuments/ndns0809year1


38 NHS Choices: *Atlas of risk*
www.nhs.uk/Tools/Pages/NHSAtlasofrisk.aspx

39 Food Standards Agency: *Annual Report of the Chief Scientist 2007/08, section on obesity p.38*
food.gov.uk/science/researchpolicy/chiefsct/csreps/


www.ic.nhs.uk/pubs/hse08trends

www.scotland.gov.uk/Publications/2009/09/28102003/10

43 *The Northern Ireland Health and Social Wellbeing Survey 2005/06*
www.dhsspsni.gov.uk/hwb_topline_bulletin.pdf

  www.foresight.gov.uk/OurWork/ActiveProjects/Obesity/Obesity.asp

  www.heartforum.org.uk/resources/nhf-publications/


  www.scotland.gov.uk/publications/2008/06/20155902/0

49 The Scottish Government (2010): *Preventing Overweight and Obesity in Scotland – A Route Map Towards Healthy Weight*
  www.scotland.gov.uk/Publications/2010/02/17140721/0

50 Food Standards Agency (2010): *Northern Ireland: Conference on obesity*
  food.gov.uk/news/newarchive/2010/jan/obesityconference

51 Welsh Assembly Government: *Draft all Wales obesity pathway*
  www.wales.gov.uk/consultations/healthsocialcare/obesitypathway/?lang=en

  www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/food/food_matters1.pdf

53 Food Standards Agency: *NDNS (Adults) (2002) vol 1*
  food.gov.uk/science/dietarysurveys/ndnsdocuments/ndnsprevioussurveyreports/

54 British Hospitality Association (2009): *Trends and development report*
  www.bha.org.uk/details1.cfm?page=policy&section=blog&codeid=3873&CFID=15792314&CFTOKEN=59337433

55 Food Standards Agency (2010): *Catering commitments from catering businesses and food service providers*
  food.gov.uk/healthiereating/healthycatering/cateringbusiness/commitments

56 Food Standards Agency: *Small business strategy*
  food.gov.uk/multimedia/pdfs/enforcement/enfe09048a.pdf
57. Food Standards Agency (2009): *Consumer response to nutrition information available in catering outlets report*
food.gov.uk/multimedia/pdfs/cateringoutletreport.pdf

58. Food Standards Agency (2009): *Evaluation of provision of calorie information by catering outlets*
food.gov.uk/science/socsci/ssres/nutritionss/evalcalinfocateringoutlets

59. Food Standards Agency (2009): *Calorie labelling and nutrition information in catering*
food.gov.uk/healthiereating/healthycatering/cateringbusiness/calorie

60. Food Standards Agency (2009): *Consultation on provision of calorie labelling and nutrition information in catering*
food.gov.uk/healthiereating/healthycatering/cateringbusiness/calorie

food.gov.uk/healthiereating/healthycatering/pubinstguide

food.gov.uk/healthiereating/satfatenergy/satfatprog/

63. Health Promotion Agency (now Public Health Agency) for Northern Ireland: *Childhood obesity – a weighty issue for Northern Ireland*
www.hpani.org/work/publicrelations/PressReleases/childobesity.htm

64. Food Standards Agency (2009): *Recommendations to industry on saturated fat and added sugar reductions*
food.gov.uk/news/newsarchive/2010/mar/reducesat

65. Food Standards Agency: *Saturated fat awareness campaign*
food.gov.uk/healthiereating/satfatenergy/satfatcons/

food.gov.uk/science/researchpolicy/chiefscl/csreps/

doi:10.1016/S0140-6736(02)11911-8

68. British Heart Foundation statistics website
www.heartstats.org/homepage.asp

69. Blood Pressure Association: *Salt and blood pressure*
www.bpassoc.org.uk
70 Consensus Action on Salt and Health: Salt and health
www.actiononsalt.org.uk/health/salt_and_health.htm

71 Scientific Advisory Committee on Nutrition (2003): Salt and health
www.sacn.gov.uk/search/index.html?search=salt+and+blood+pressure

72 Food Standards Agency (September 2009): Board Paper FSA 09/09/08
food.gov.uk/aboutus/ourboard/boardmeetings/boardmeetings2009/090916/
boardagenda090916

73 Food Standards Agency: Salt campaign
food.gov.uk/healthiereating/salt/

74 Food Standards Agency (2009): Salt phone app
food.gov.uk/news/newsarchive/2009/oct/phoneapp

75 Food Standards Agency (2009): Salt targets
food.gov.uk/healthiereating/salt/saltreduction

76 Food Standards Agency (2009): Salt reduction targets for 2010 and 2012
food.gov.uk/healthiereating/salt/saltreduction

77 Food Standards Agency (2010): Exploring public understanding of salt and sodium labelling
food.gov.uk/science/socsci/ssres/labelss/saltsodium

78 Food Standards Agency (2010): US sets salt targets
food.gov.uk/news/newsarchive/2010/jan/ussalttargets

www.bis.gov.uk/go-science/publications

80 European Commission: Seventh Framework Research Programme (FP7)
www.ec.europa.eu/research/fp7/index_en.cfm

81 Food Standards Agency (September 2009): Board Paper FSA 09/09/06
food.gov.uk/aboutus/ourboard/boardmeetings/boardmeetings2009/090916/
boardagenda090916

82 Food Standards Agency (2009): The Public inquiry into the September 2005 outbreak of E. coli in South Wales
food.gov.uk/news/newsarchive/2009/mar/ecoliwales

83 Food Standards Agency (2010): The single integrated national control plan for the UK, Rev. 4
food.gov.uk/foodindustry/regulation/europeleg/feedandfood/ncpuk
84 Social Science Research Committee (October 2009): *Paper SSRC/09/2/3 Evidence review of regulation cultures and behaviours*, ssrc.food.gov.uk/meetings/2009/091002/ssrc091020


86 Food Standards Agency: *Scottish research project S14006* food.gov.uk/science/research/devolvedadmins/scotlandresearch/scotlandprojectlist/s14006/

87 Food Standards Agency: *Phytoestrogen research project T05028* food.gov.uk/science/research/foodcomponentsresearch/phytoestrogensresearch/t05-t06programme/t05t06projectlist/t05028/

88 The European Prospective Investigation into Cancer and Nutrition (EPIC) http://epic.iarc.fr/

89 Food Standards Agency: *Food authenticity research and survey work* food.gov.uk/science/research/choiceandstandardsresearch/authenticityresearch/

90 Food Standards Agency: *Food authenticity research project Q01114* food.gov.uk/science/research/choiceandstandardsresearch/authenticityresearch/q01list_fruitjuice/q01114/


93 Food Standards Agency: *Diet and cardiovascular health research programme* food.gov.uk/science/research/nutritionresearch/dietandcardiovasc/n02programme/


www.aaccnet.org/cerealfoodsworld/pdfs/CFW-54-2-suppl.pdf

www.aaccnet.org/cerealfoodsworld/pdfs/CFW-54-2-suppl.pdf

The Learning Early About Peanut Allergy (LEAP) study 
www.leapstudy.co.uk/

Food Standards Agency: Peanut allergy research 
food.gov.uk/science/research/foodcomponentsresearch/allergyresearch/t07programme/

www3.interscience.wiley.com/journal/122208002/abstract?CRETRY=1&SRETRY=0

Soil Association: Organic market report 2010 

www.cochrane.org/training/cochrane-handbook

Food Standards Agency (2009): Organic nutrient content review 

doi:10.3945/ajcn.2009.28041

Food Standards Agency (2009): Organic health effects review 


108  Food Standards Review: Independent signpost evaluation study food.gov.uk/foodlabelling/signposting/signpostevaluation/


112  Food Standards Agency (2010): Citizens’ forums on food: Front-of-pack nutrition labelling food.gov.uk/foodlabelling/researchandreports/citforumfop

113  Food Standards Agency (March 2010): Board Minutes food.gov.uk/aboutus/ourboard/boardmeetings/#anchor_532041

114  Food Standards Agency: Guide to using the nutrient profiling model food.gov.uk/healthiereating/advertisingtochildren/nutlab/nutprofmod

115  Food Standards Agency Board (March 2009): Board Paper FSA 09/03/06 food.gov.uk/aboutus/ourboard/boardmeetings/boardmeetings2009/090325/boardagenda090325


119  Food Standards Agency: Quality assurance in research – Joint Code of Practice (CoP) food.gov.uk/science/researchpolicy/qacopres/

121 Food Standards Agency (2009): Social science tender opportunity
food.gov.uk/news/newsarchive/2009/mar/socalsciencetenderopp

122 General Advisory Committee on Science (February 2009): Paper GACS 3 – 2
Performance indicators for the Agency’s science
gacs.food.gov.uk/gacsmeets/gacs2009/25feb09/gacsagenda090225

123 General Advisory Committee on Science (March 2010): Paper GACS 5 – 4
Review of ACAF and Agency response
gacs.food.gov.uk/gacsmeets/gacs2010/4march10/gacsagenda100304

124 General Advisory Committee on Science
gacs.food.gov.uk/

125 Social Science Research Committee
ssrc.food.gov.uk/meetings/

126 Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment
cot.food.gov.uk/

127 Committee on Toxicity (May 2010): Paper TOX/2010/10 COT workshop on
the evaluation and expression of uncertainties in risk assessment
cot.food.gov.uk/cotmtgs/cotmeets/cotmeet2010/cotmeet4may2010/
cotagendapapers4may10

128 General Advisory Committee on Science (March 2010): Minutes
gacs.food.gov.uk/gacsmeets/gacs2010/4march10/gacsmins100304

129 Sense about science (2010): Principles for the treatment of independent
scientific advice
www.senseaboutscience.org.uk/index.php/site/project/421

130 Department for Business Innovation & Skills (2009): Guidelines on Scientific
Analysis in Policy Making – A consultation
www.bis.gov.uk/Consultations/guidelines-on-scientific-analysis

131 The Government Chief Scientific Adviser: Guidelines on the use of scientific and
engineering advice in policy making and The responses to the consultation
bis.ecgroup.net/Publications/Science/ChiefScientificAdviser.aspx

132 Defra (2010): Food 2030 strategy
www.defra.gov.uk/foodfarm/food/strategy/index.htm

Research and Innovation
www.bis.gov.uk/assets/bispartners/goscience/docs/c/cross-government-food-
research-strategy.pdf
134 European Commission: *Regulation (CE) No. 882/2004 on official feed, food, animal health and animal welfare controls*
www.ec.europa.eu/food/food/controls/foodfeed/index_en.htm

135 Food Standards Agency (2008): *National control plan for the UK*
food.gov.uk/foodindustry/regulation/europeleg/feedandfood/ncpuk

136 Food Standards Agency (2009): *Fera: First annual report in operations of national reference laboratory in chemicals in food and feed*
food.gov.uk/news/newsarchive/2009/jul/nrifirstannualreport

137 Food Standards Agency (2009): *National reference laboratory for GM food and feed*
food.gov.uk/news/newsarchive/2009/may/appointmentoflgc

138 Food Standards Agency: *Postgraduate scholarship scheme*
food.gov.uk/science/researchpolicy/scholarshipscheme/

139 European Food Safety Authority: *Focal Points*

140 Food Standards Agency: *The Agency in Europe*
food.gov.uk/aboutus/agencyandeurope/

www.civilservice.gov.uk/my-civil-service/networks/professional/gsr/index.aspx

142 Food Standards Agency (2008): *Northern Ireland Strategic Committee on Food Surveillance Sampling Report*
food.gov.uk/news/newsarchive/2008/dec/niscfsfs

143 Food Standards Agency (2010): *Scottish Food Sampling Report*

144 Food Standards Agency (March 2010): *Board Paper FSA 10/03/10*
food.gov.uk/aboutus/ourboard/boardmeetings/boardmeetings2010/100310/agenda100310

145 General Advisory Committee on Science (September 2009): *Paper GACS 4 – 3*
gacs.food.gov.uk/gacsmeets/gacs2009/8sept09/gacsagenda090908

146 Global food security (2010): *Global food security research programme*
www.foodsecurity.ac.uk/programme/about-the-programme.html

147 Foresight: *Global food and farming futures*
www.foresight.gov.uk/OurWork/ActiveProjects/FoodandFarmingFutures/ FoodandfarmingProjectHome.asp

149 House of Lords Science and Technology Committee (January 2010): *Nanotechnologies and food*
www.publications.parliament.uk/pa/ld/ldsstech.htm

150 Food Standards Agency (2010): *Government response to the House of Lords Science and Technology Committee Report on nanotechnologies and food*
food.gov.uk/gmfoods/novel/nano

151 Food Standards Agency (2010): *UK Nanotechnologies strategy*
food.gov.uk/gmfoods/novel/nano

152 Food Standards Agency: *Nanotechnology projects T01061 and T01062*
food.gov.uk/science/research/foodcomponentsresearch/riskassessment/t01programme/t01projlist/

153 Food Standards Agency: *Nanoparticles in food project G03033*
food.gov.uk/science/research/foodcomponentsresearch/novelfoodsresearch/g03researchprog/g03projlist/g03033/

154 Food Standards Agency (2010): *Changes to the Food Standards Agency*
food.gov.uk/news/newsarchive/2010/jul/fsachanges

Note: Whilst care has been taken to ensure that the web links contained within the Chief Scientist Annual Report 2009/10 are correct at the time of publication, changes may occur.
The following tables list the details of the science and evidence expenditure during the financial year 2009/10

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<td>C03</td>
<td>Mycotoxins and process contaminants (including nitrate) (research)</td>
<td>125</td>
</tr>
<tr>
<td>C04</td>
<td>Mycotoxins and process contaminants (including nitrate) (surveys)</td>
<td>126</td>
</tr>
<tr>
<td>E01</td>
<td>Data quality and improved methods of analysis</td>
<td>127</td>
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<tr>
<td>E03</td>
<td>Food law enforcement</td>
<td>127</td>
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<tr>
<td>G03</td>
<td>Safety assessment of novel and GM foods</td>
<td>128</td>
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<tr>
<td>L01</td>
<td>Consumer choice and standards</td>
<td>128</td>
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<tr>
<td>M01</td>
<td>Meat hygiene – microbiological safety (non-TSEs)</td>
<td>129</td>
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<td>M03</td>
<td>Transmissible Spongeform Encephalopathies (TSEs)</td>
<td>129</td>
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<tr>
<td>MC1</td>
<td>Future meat controls (research)</td>
<td>130</td>
</tr>
<tr>
<td>N02</td>
<td>Diet and cardiovascular health</td>
<td>131</td>
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<tr>
<td>N05</td>
<td>Nutritional status and function research</td>
<td>132</td>
</tr>
<tr>
<td>N08</td>
<td>Dietary Surveys and food composition (research)</td>
<td>134</td>
</tr>
<tr>
<td>N09</td>
<td>Food acceptability and choice</td>
<td>134</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Page</td>
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<td>------</td>
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</tr>
<tr>
<td>N10</td>
<td>Dietary surveys and nutrients in food (surveillance)</td>
<td>135</td>
</tr>
<tr>
<td>N12</td>
<td>Diet and colonic health</td>
<td>135</td>
</tr>
<tr>
<td>N14</td>
<td>Food choice inequalities</td>
<td>136</td>
</tr>
<tr>
<td>P01</td>
<td>Marine microbiology and biotoxins</td>
<td>136</td>
</tr>
<tr>
<td>Q01</td>
<td>Food authenticity (research)</td>
<td>137</td>
</tr>
<tr>
<td>R04</td>
<td>Radioactivity in food</td>
<td>138</td>
</tr>
<tr>
<td>S14</td>
<td>FSA Scotland (research and surveillance)</td>
<td>138</td>
</tr>
<tr>
<td>T01</td>
<td>Risk assessment</td>
<td>139</td>
</tr>
<tr>
<td>T05</td>
<td>Phytoestrogens in the diet</td>
<td>140</td>
</tr>
<tr>
<td>T07</td>
<td>Food intolerance</td>
<td>141</td>
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<tr>
<td>T10</td>
<td>Risk assessment of mixtures of pesticides and similar substances</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>Social science</td>
<td>143</td>
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<tr>
<td></td>
<td>Other science and evidence spend</td>
<td>145</td>
</tr>
</tbody>
</table>
(Expenditure includes contributions from FSA Scotland where applicable)

### A01 – Food additives (research)

Programme contact – Dr Stephen Johnson, Tel: 020 7276 8508
Email: stephen.johnson@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01073</td>
<td>Survey on the consumption of cinnamon-containing foods and drinks by the UK population</td>
<td>University of Leeds</td>
<td>16/02/2009</td>
<td>30/06/2010</td>
<td>67,250.00</td>
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<tr>
<td>A01074</td>
<td>Review and evaluate the available methods of extraction for approved natural colours in food and drink</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/10/2009</td>
<td>31/03/2010</td>
<td>43,251.00</td>
</tr>
<tr>
<td>A01075</td>
<td>Study on the potential use of unapproved substances as food additives in foods on the UK market</td>
<td>Laboratory of the Government Chemist (LGC)</td>
<td>11/01/2010</td>
<td>24/09/2010</td>
<td>15,000.00</td>
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<td><strong>Total:</strong></td>
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<td><strong>125,501.00</strong></td>
</tr>
</tbody>
</table>

### A03 – Chemical contaminants from food contact materials & articles (research)

Programme contact – Dr Karen Barnes, Tel: 020 7276 8541
Email: karen.barnes@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A03066</td>
<td>Investigation into the effect of additives on migration of substances originating from colourants used in food contact plastics</td>
<td>PIRA International</td>
<td>01/10/2007</td>
<td>30/10/2009</td>
<td>22,478.00</td>
</tr>
<tr>
<td>A03067</td>
<td>Measurement of packaged food intake of selected groups of adults by kilogram body weight to include type of packaging and foodstuff</td>
<td>University of Newcastle</td>
<td>01/11/2007</td>
<td>30/11/2009</td>
<td>111,185.00</td>
</tr>
<tr>
<td>A03068</td>
<td>Literature review, analytical screening and chemical migration studies on irradiated food packaging</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>17/09/2007</td>
<td>17/07/2009</td>
<td>32,144.00</td>
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<tr>
<td>A03069</td>
<td>Screening tests for visible and non-visible set-off</td>
<td>PIRA International</td>
<td>01/11/2008</td>
<td>30/04/2011</td>
<td>25,568.00</td>
</tr>
</tbody>
</table>
### A04 – Chemical contaminants from food contact materials & articles (surveys)
Programme contact – Dr Karen Barnes, Tel: 020 7276 8541
Email: karen.barnes@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A04016</td>
<td>A 4 year rolling programme of surveys on migrants from food contact materials and articles</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>16/01/2008</td>
<td>31/12/2010</td>
<td>96,690.00</td>
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<tr>
<td>B11013</td>
<td>Development and validation of methods for the detection and identification of sorbitol-fermenting Verocytotoxin-producing <em>Escherichia coli</em> O157:H-</td>
<td>SAC Commercial Ltd</td>
<td>01/10/2007</td>
<td>31/03/2010</td>
<td>48,682.00</td>
</tr>
</tbody>
</table>

**Total:** 257,527.00

### B11 – Verocytotoxin-producing *E.coli* O157 (VTEC)
Programme contact – Mr David Alexander, Tel: 020 7276 8949
Email: david.alexander@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>B11013</td>
<td>Development and validation of methods for the detection and identification of sorbitol-fermenting Verocytotoxin-producing <em>Escherichia coli</em> O157:H-</td>
<td>SAC Commercial Ltd</td>
<td>01/10/2007</td>
<td>31/03/2010</td>
<td>48,682.00</td>
</tr>
</tbody>
</table>

**Total:** 48,682.00

### B12 – Microbiological risk assessment
Programme contact – Dr Joanne Aish, Tel: 020 7276 8965
Email: joanne.aish@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B12008</td>
<td>The survival of <em>M. bovis</em> and <em>E. coli</em> O157 in UK-produced cheeses made from raw, cows’ milk</td>
<td>CCFRA</td>
<td>01/09/2007</td>
<td>01/09/2010</td>
<td>120,012.00</td>
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**Total:** 120,012.00
### B13 – Microbiological risk management

Programme contact – Dr Joanne Aish, Tel: 020 7276 8965
Email: joanne.aish@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
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<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B13008</td>
<td>An investigation into the attitudes and behaviours of consumers and caregivers in the preparation, handling, storage and feeding of powdered infant formula inside and outside the home</td>
<td>University of Wales Institute, Cardiff</td>
<td>01/05/2007</td>
<td>31/12/2009</td>
<td>21,085.20</td>
</tr>
<tr>
<td>B13011</td>
<td>Validation of the new CEN/ISO standard to detect Enterobacter sakazakii</td>
<td>Health Protection Agency (HPA)</td>
<td>19/02/2007</td>
<td>26/02/2010</td>
<td>2,700.00</td>
</tr>
<tr>
<td>B13015</td>
<td>Literature review on microbiological hazards associated with biltong and similar dried meat products</td>
<td>Campden BRI</td>
<td>18/01/2010</td>
<td>31/03/2010</td>
<td>16,126.00</td>
</tr>
</tbody>
</table>

Total: 39,911.20

### B14 – Foodborne disease

Programme contact – Miss Louise Knowles, Tel: 020 7276 8966
Email: louise.knowles@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B14004</td>
<td>Generate an archive of extracted nucleic acid for IID archived faecal specimens</td>
<td>Health Protection Agency (HPA)</td>
<td>01/01/2003</td>
<td>31/03/2010</td>
<td>7,578.00</td>
</tr>
<tr>
<td>B14016</td>
<td>The role of commensal microflora of animals in the transmission of extended spectrum β-lactamases (ESBLs)</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/04/2009</td>
<td>31/03/2011</td>
<td>60,000.00</td>
</tr>
<tr>
<td>B14017</td>
<td>The role of commensal microflora of animals in the transmission of extended spectrum β-lactamases (ESBLs)</td>
<td>Health Protection Agency (HPA)</td>
<td>01/10/2009</td>
<td>31/03/2011</td>
<td>20,000.00</td>
</tr>
<tr>
<td>B18021</td>
<td>The second study of infectious intestinal disease in the community – determining disease burden and calibrating national surveillance data in the United Kingdom</td>
<td>University of Manchester</td>
<td>01/04/2006</td>
<td>31/12/2010</td>
<td>1,182,277.28</td>
</tr>
</tbody>
</table>

Total: 1,269,855.28

* Where there is more than one project with the same title, each code represents a different work stream.
## B15 – Eggs and poultry

Programme contact – Mrs Mary Howell, Tel: 020 7276 8373  
Email: mary.howell@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title*</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B15015</td>
<td>Host acute stress responses and the regulation of <em>Campylobacter jejuni</em> virulence in the avian gut</td>
<td>BBSRC</td>
<td>01/11/2006</td>
<td>31/10/2009</td>
<td>9,807.50</td>
</tr>
<tr>
<td>B15016</td>
<td>Host acute stress responses and the regulation of <em>Campylobacter jejuni</em> virulence in the avian gut</td>
<td>BBSRC</td>
<td>08/01/2007</td>
<td>31/01/2010</td>
<td>7,104.74</td>
</tr>
<tr>
<td>B15018</td>
<td>National flock prevalence survey of <em>Campylobacter</em></td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/10/2006</td>
<td>31/05/2010</td>
<td>52,710.96</td>
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<tr>
<td>B15021</td>
<td>A nitric oxide responsive network in <em>Campylobacter jejuni</em>, its role in intracellular survival and resistance to nitrosative stresses</td>
<td>BBSRC</td>
<td>01/06/2007</td>
<td>31/05/2010</td>
<td>21,512.00</td>
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<tr>
<td>B15022</td>
<td>A nitric oxide responsive network in <em>Campylobacter jejuni</em>, its role in intracellular survival and resistance to nitrosative stresses</td>
<td>BBSRC</td>
<td>01/03/2007</td>
<td>28/02/2010</td>
<td>15,830.87</td>
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<tr>
<td>B15024</td>
<td>An Investigation of water treatment as an intervention to reduce <em>Campylobacter</em> on the poultry farm</td>
<td>SAC Commercial Ltd</td>
<td>01/03/2008</td>
<td>28/02/2009</td>
<td>12,556.72</td>
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<tr>
<td>B15027</td>
<td>Molecular mechanisms underlying the interaction of <em>Salmonella</em> Enteritidis with the hen oviduct and survival in eggs</td>
<td>BBSRC</td>
<td>01/09/2008</td>
<td>31/08/2011</td>
<td>26,009.94</td>
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<tr>
<td>B15028</td>
<td>Molecular mechanisms underlying the interaction of <em>Salmonella</em> Enteritidis with the hen oviduct and survival in eggs</td>
<td>BBSRC</td>
<td>01/03/2008</td>
<td>28/02/2011</td>
<td>33,401.00</td>
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</table>

*Where there is more than one project with the same title, each code represents a different work stream.*

Total: **178,933.73**
### B18 – Microbiological surveillance

Programme contact – Mr Adam Hardgrave, Tel: 020 7276 8957
Email: adam.hardgrave@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
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<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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</thead>
<tbody>
<tr>
<td>B18027</td>
<td>Integrated monitoring and control of foodborne viruses in European food supply chains (VITAL)</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/04/2008</td>
<td>31/03/2011</td>
<td>8,500.00</td>
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</table>

**Total:** 8,500.00

### C01 – Chemical contaminants from food production (research)

Programme contact – Dr Kevin Hargin, Tel: 020 7276 8953
Email: kevin.hargin@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
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<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C01041</td>
<td>Environmental contaminants in fish and shellfish from unmanaged inland UK waterways</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/01/2006</td>
<td>31/03/2010</td>
<td>42,223.00</td>
</tr>
<tr>
<td>C01044</td>
<td>Investigation of the long-term effects of river flooding on levels of organic environmental contaminants in food from livestock reared on flood-prone pastures</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/05/2007</td>
<td>31/03/2011</td>
<td>199,740.54</td>
</tr>
<tr>
<td>C01047</td>
<td>Development of a national retail sampling plan and carry out the purchase of about 300 processed/unprocessed and packaged/unpackaged samples of fish, meat and poultry, dairy products, fats, oils and fatty and oily foodstuffs for the analysis of phthalate</td>
<td>Ventress Technical Limited</td>
<td>21/09/2000</td>
<td>31/03/2010</td>
<td>21,200.00</td>
</tr>
<tr>
<td>C01048</td>
<td>Determination of phthalates in foods and establishing methodology to distinguish their source</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/02/2008</td>
<td>31/03/2010</td>
<td>94,730.00</td>
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**Total:** 357,893.54
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<th>Project</th>
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<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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</thead>
<tbody>
<tr>
<td>C03059</td>
<td>Investigate the impact of agronomic practices on mycotoxin levels in oats and analysis of the implications of modifying agronomic practices</td>
<td>Harper Adams University College</td>
<td>01/09/2008</td>
<td>31/05/2012</td>
<td>25,801.00</td>
</tr>
<tr>
<td>C03060</td>
<td>Determination of masked Fusarium mycotoxins in cereals and cereal-based food</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/07/2008</td>
<td>30/09/2009</td>
<td>34,678.40</td>
</tr>
<tr>
<td>C03061</td>
<td>Investigation of the loss of parent Fumonisin mycotoxins during food processing</td>
<td>RHM Technology</td>
<td>01/10/2008</td>
<td>03/04/2010</td>
<td>18,720.00</td>
</tr>
<tr>
<td>C03066</td>
<td>Collection of food samples for a four-year mycotoxin surveillance programme</td>
<td>Ventress Technical Limited</td>
<td>01/01/2009</td>
<td>31/01/2013</td>
<td>12,810.00</td>
</tr>
<tr>
<td>C03067</td>
<td>Analysis of mycotoxins in foods: A four year surveillance programme</td>
<td>Premier Analytical Services</td>
<td>01/01/2009</td>
<td>31/01/2013</td>
<td>67,121.00</td>
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<td><strong>Total:</strong></td>
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<td><strong>159,130.40</strong></td>
</tr>
</tbody>
</table>
### C04 – Mycotoxins and process contaminants (including nitrate) (surveys)

Programme contact – Mr Andrew Spencer, Tel: 020 7276 8507
Email: andrew.spencer@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title*</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C04059</td>
<td>Survey of acrylamide, 3-monochloropropane-1,2-diol (3-MCPD), ethyl carbamate and furan in UK retail samples</td>
<td>RHM Technology</td>
<td>01/02/2007</td>
<td>31/01/2010</td>
<td>63,425.00</td>
</tr>
<tr>
<td>C04060</td>
<td>Development of a sampling plan and collection of samples for the survey of acrylamide, 3-monochloropropane-1,2-diol (3-MCPD), ethyl carbamate and furan in UK retail samples</td>
<td>Ventress Technical Limited</td>
<td>01/02/2007</td>
<td>01/02/2010</td>
<td>20,722.00</td>
</tr>
<tr>
<td>C04071</td>
<td>The chemical analysis for nitrate concentrations in 250 samples/annum of domestic and imported lettuce and spinach (including canned and frozen) with associated reporting of results on a routine and annual basis</td>
<td>ADAS UK Ltd</td>
<td>01/01/2009</td>
<td>31/01/2014</td>
<td>35,186.10</td>
</tr>
<tr>
<td>C04074</td>
<td>Investigation of the formation of 3-MCPD (3-monochloropropane-1,2-diol) from mono- and di-esters of its fatty acids in foods</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/01/2010</td>
<td>31/03/2013</td>
<td>2,617.00</td>
</tr>
<tr>
<td>C04075</td>
<td>Investigation of the formation of 3-MCPD (3-monochloropropane-1,2-diol) from mono- and di-esters of its fatty acids in foods</td>
<td>Institute of Chemical Technology, Prague</td>
<td>01/01/2010</td>
<td>31/12/2013</td>
<td>7,050.00</td>
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</tbody>
</table>

Total: 129,000.10

*Where there is more than one project with the same title, each code represents a different work stream*
### E01 – Data quality and improved method of analysis

Programme contact – Dr Andrew Damant, Tel: 020 7276 8757
Email: andrew.damant@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E01085</td>
<td>The uncertainty of microbiological counts on foods due to sample heterogeneity</td>
<td>University of Bristol</td>
<td>01/10/2007</td>
<td>31/12/2009</td>
<td>9,358.20</td>
</tr>
<tr>
<td>E01086</td>
<td>Development and single-laboratory validation of a method for glucosinolate analysis in food</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/10/2007</td>
<td>31/03/2009</td>
<td>36,233.00</td>
</tr>
<tr>
<td>E01088</td>
<td>Assessment of the contribution of sampling to total measurement uncertainty estimations</td>
<td>Laboratory of the Government Chemist (LGC)</td>
<td>01/01/2009</td>
<td>31/12/2010</td>
<td>57,248.00</td>
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<tr>
<td>E01089</td>
<td>An evaluation of the methodological approaches for the determination of different carbohydrate fractions in foods</td>
<td>Laboratory of the Government Chemist (LGC)</td>
<td>02/01/2009</td>
<td>31/12/2010</td>
<td>50,792.00</td>
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Total: 153,631.20

### E03 – Food law enforcement

Programme contact – Dr Alan Curran, Tel: 020 7276 8361
Email: alan.curran@foodstandards.gsi.gov.uk

<table>
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<tr>
<th>Project</th>
<th>Project Title</th>
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<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>E03010</td>
<td>Evaluation of effectiveness and cost benefit of two different enforcement regimes in meat plants</td>
<td>ADAS Consulting</td>
<td>01/08/2006</td>
<td>31/10/2009</td>
<td>34,480.00</td>
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Total: 34,480.00
### G03 – Safety assessment of novel and GM foods

Programme contact – Dr David Jefferies, Tel: 020 7276 8573  
Email: david.jefferies@foodstandards.gsi.gov.uk

<table>
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<th>Project</th>
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<tr>
<td>G03019</td>
<td>An investigation of the use of MudPIT as a tool for the separation and quantification of proteins for GM crop safety assessments</td>
<td>Royal Holloway, University of London</td>
<td>01/01/2006</td>
<td>30/09/2010</td>
<td>60,000.44</td>
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<td>G03029</td>
<td>Determination of inauthentic protein glycosylation in transgenic plants</td>
<td>BBSRC Rothamsted Research</td>
<td>01/03/2007</td>
<td>27/12/2009</td>
<td>135,470.70</td>
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<tr>
<td>G03031</td>
<td>Factors influencing transgene survival and transfer in the rumen</td>
<td>Rowett Institute of Nutrition and Health</td>
<td>01/03/2008</td>
<td>30/06/2011</td>
<td>56,626.72</td>
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<tr>
<td>G03032</td>
<td>GMOseek: The development of screening methods for GMOs</td>
<td>National Institute of Biology (Slovenia)</td>
<td>01/06/2009</td>
<td>31/05/2011</td>
<td>49,814.61</td>
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<tr>
<td>G03033</td>
<td>Nanoparticles in food: analytical methods for detection and characterisation</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>10/01/2010</td>
<td>31/12/2012</td>
<td>8,101</td>
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Total: 310,013.47

### L01 – Consumer choice and standards†

Programme contact – Dr Nigel Harrison  
Email: cst@foodstandards.gsi.gov.uk

<table>
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<th>Project</th>
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<th>Start Date</th>
<th>End Date</th>
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<tbody>
<tr>
<td>L01004</td>
<td>Survey of the uptake of Food Standards Agency guidance on country of origin labelling</td>
<td>Campden Technology Ltd</td>
<td>27/04/2009</td>
<td>30/09/2009</td>
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<td>L01006</td>
<td>Label area taken up by mandatory and nutrition labelling information on small packs</td>
<td>Campden Technology Ltd</td>
<td>01/08/2009</td>
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Total: 123,378.00

† This area of work transferred to Defra on 20 July 2010
### M01 – Meat hygiene – microbiological safety (non-TSE research)

Programme contact – Mrs Mary Howell, Tel: 020 7276 8373  
Email: mary.howell@foodstandards.gsi.gov.uk

<table>
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<tr>
<th>Project</th>
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<tbody>
<tr>
<td>M01048</td>
<td>A detailed study of the prevalence of veterinary medicine residues (e.g. parasiticides) in ‘skin-on’ sheep feet</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/02/2008</td>
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<td>51,168.40</td>
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<tr>
<td>M01049</td>
<td>The microbiological status of wild and farmed venison</td>
<td>University of Nottingham</td>
<td>01/02/2008</td>
<td>31/07/2010</td>
<td>116,899.56</td>
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<td>M01052</td>
<td><em>Trichinella</em> in UK wildlife</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/04/2009</td>
<td>31/03/2012</td>
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### M03 – Transmissible Spongiform Encephalopathies (TSEs)

Programme contact – Dr Irene Hill, Tel: 020 7276 8324  
Email: irene.hill@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
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<tr>
<td>M03024</td>
<td>Susceptibility of UK red deer (<em>Cervus elaphus elaphus</em>) to oral BSE transmission</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/09/2003</td>
<td>31/03/2009</td>
<td>126,375.00</td>
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<td>M03039</td>
<td>Toward an ante-mortem test for bovine spongiform encephalopathy: an ion mobility/mass spectrometry approach</td>
<td>University of Warwick</td>
<td>01/02/2007</td>
<td>30/09/2009</td>
<td>28,892.56</td>
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<tr>
<td>M03040</td>
<td>Development of <em>ex vivo</em> model systems to measure BSE titre</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/04/2007</td>
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<td>28,362.44</td>
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<tr>
<td>M03043</td>
<td>Exploring permeability of human species barrier to circulating TSE agent</td>
<td>École Nationale Vétérinaire de Toulouse (ENVT)</td>
<td>01/03/2007</td>
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<td>108,140.00</td>
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<tr>
<td>M03054</td>
<td>Risk of transmission of atypical forms of animal TSE in humans</td>
<td>University of Edinburgh</td>
<td>01/04/2007</td>
<td>31/08/2011</td>
<td>123,241.13</td>
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<td>M03056</td>
<td>The tissue distribution of disease-related PrP and infectivity for atypical scrapie in sheep following experimental oral challenge</td>
<td>University of Edinburgh</td>
<td>01/05/2007</td>
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<tr>
<td>M03057</td>
<td>Investigation of infectivity of ARR/ARR atypical scrapie in slaughter age sheep by oral dosing of young lambs of the homologous genotype</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>15/01/2007</td>
<td>31/03/2012</td>
<td>58,221.20</td>
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<tr>
<td>M03058</td>
<td>Infectivity and abnormal PrP in tissues from sheep exposed to atypical scrapie</td>
<td>École Nationale Vétérinaire de Toulouse (ENVT)</td>
<td>01/07/2007</td>
<td>30/06/2013</td>
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<td>M03059</td>
<td>Distribution of infectivity and PrPSc in edible tissues of scrapie-infected sheep</td>
<td>Moredun Research Institute</td>
<td>01/04/2007</td>
<td>31/03/2010</td>
<td>103,127.75</td>
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<td>M03060</td>
<td>Quantification of PrPd and correlation with infectivity in scrapie infected sheep tissues destined for human consumption</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/04/2007</td>
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<td>50,261.76</td>
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<td>M03062</td>
<td>Development of a multi-marker live animal diagnostic specific to TSE disease in blood plasma which is not reliant on the presence of PrPSc</td>
<td>University of Edinburgh</td>
<td>01/08/2007</td>
<td>31/07/2010</td>
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<td>M03063</td>
<td>Use of fluorescence correlation spectroscopy to detect single prion particles (surface-FIDA)</td>
<td>Heinrich-Heine-University of Düsseldorf (Germany)</td>
<td>01/11/2007</td>
<td>31/10/2010</td>
<td>72,551.22</td>
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<td>M03066</td>
<td>To determine the occurrence and to quantify the level of CNS contamination on bovine head meat after slaughter</td>
<td>University of Bristol</td>
<td>10/11/2008</td>
<td>30/06/2010</td>
<td>115,887.60</td>
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<tr>
<td>M03067</td>
<td>Cost benefit analysis of the development and use of ante-mortem tests for Transmissible Spongiform Encephalopathies</td>
<td>DNV UK (Det Norske Veritas)</td>
<td>15/06/2009</td>
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**Total:** 1,208,285.31
### MC1 – Future meat controls (research)
Programme contact – Mr Carles Orri, Tel: 020 7276 8406
Email: carles.orri@foodstandards.gsi.gov.uk

<table>
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<tbody>
<tr>
<td>MC1001</td>
<td>Review of historic ante-mortem and post-mortem inspection data</td>
<td>Veterinary Laboratories Agency (VLA)</td>
<td>01/03/2010</td>
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**Total:** 29,806.65

### N02 – Diet and cardiovascular health†
Programme contact – Miss Emma Peacock
Email: cst@foodstandards.gsi.gov.uk

<table>
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<th>Project</th>
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<tbody>
<tr>
<td>N02035</td>
<td>Comparison of effects of increased whole grain foods on markers of cardiovascular risk</td>
<td>University of Aberdeen</td>
<td>01/01/2005</td>
<td>30/06/2009</td>
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<tr>
<td>N02038</td>
<td>Effect of tomato-rich diet on markers of cardiovascular risk</td>
<td>University of Aberdeen</td>
<td>01/02/2007</td>
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<tr>
<td>N02039</td>
<td>Impact of increasing doses of flavonoid-rich and flavonoid-poor fruit and vegetables on cardiovascular risk factors in an ‘at risk’ group (URFAVS)</td>
<td>University of Reading</td>
<td>01/03/2007</td>
<td>30/06/2010</td>
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<tr>
<td>N02041</td>
<td>Influence of increasing intakes of EPA and DHA on vascular function and risk factors for cardiovascular disease</td>
<td>King’s College London</td>
<td>14/01/2008</td>
<td>14/01/2011</td>
<td>274,185.00</td>
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<tr>
<td>N02042</td>
<td>The dose response effect of fruit and vegetables on insulin resistance in healthy participants who are overweight and at high-risk of cardiovascular disease (CVD): a randomised controlled trial</td>
<td>Queens University Belfast</td>
<td>01/03/2008</td>
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<tr>
<td>N02044</td>
<td>The effects of the substitution of dietary SFA with n-6 PUFA or MUFA on vascular function</td>
<td>University of Reading</td>
<td>01/04/2009</td>
<td>30/06/2013</td>
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† This area of work will be transferring to the Department of Health later in 2010
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<tr>
<td>N02045</td>
<td>The impact of common gene variants on the response of cardiovascular risk factors to fish oil fatty acids (FINGEN2)</td>
<td>University of Reading</td>
<td>01/10/2009</td>
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<tr>
<td>N02046</td>
<td>Effects of nitrate rich vegetables on cardiovascular function</td>
<td>University of Newcastle</td>
<td>01/10/2009</td>
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<td>N02047</td>
<td>Integrated dietary intervention to reduce risk of cardiovascular disease</td>
<td>King’s College London</td>
<td>12/01/2010</td>
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**N05 – Nutritional status and function research†**

Programme contact – Miss Rachel Elsom  
Email: cst@foodstandards.gsi.gov.uk

<table>
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<tr>
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<tbody>
<tr>
<td>N05065</td>
<td>Assessing the impact of escalating fish oil consumption in different cell types: Implications for UK fatty acid status and dietary recommendations</td>
<td>Medical Research Council – Human Nutrition Research</td>
<td>01/01/2006</td>
<td>15/10/2010</td>
<td>107,747.00</td>
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<tr>
<td>N05066</td>
<td>Dose response relationship between n-3 PUFA supply and n-3 PUFA content of transport, storage and functional pools in humans</td>
<td>University of Southampton</td>
<td>01/01/2006</td>
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<td>N05068</td>
<td>Effect of a dietary intervention on functional immune status in the elderly</td>
<td>University of Sheffield</td>
<td>31/07/2009</td>
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<td>N05071</td>
<td>Maternal, infant and childhood diet: influence on respiratory health and asthma in childhood</td>
<td>University of Southampton</td>
<td>01/01/2007</td>
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<td>N05072</td>
<td>Vitamin B12, cognitive health and neurological function in older people</td>
<td>London School of Hygiene &amp; Tropical Medicine (LSHTM)</td>
<td>01/03/2007</td>
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† This area of work will be transferring to the Department of Health later in 2010
<table>
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<tbody>
<tr>
<td>N05073</td>
<td>Development of metabolomics as novel approach to biological indicators which characterise and quantify dietary exposure</td>
<td>University of Wales Aberystwyth</td>
<td>01/01/2007</td>
<td>31/12/2009</td>
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<tr>
<td>N05074</td>
<td>Validating in vivo biomarkers of colonic carbohydrate and protein fermentation</td>
<td>University of Glasgow</td>
<td>01/04/2007</td>
<td>31/12/2009</td>
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<td>N05075</td>
<td>Biomarkers of whole-grain intake; contribution of alkylresorcinols and mammalian lignans to the metabolome</td>
<td>University of Newcastle</td>
<td>01/01/2007</td>
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<td>N05077</td>
<td>Urinary MMA revisited: a biomarker of B12 status applicable to large surveys?</td>
<td>University of Sheffield</td>
<td>01/01/2008</td>
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<td>N05079</td>
<td>Effect of 1 year vitamin D intervention on risk of cardiovascular disease: a randomized controlled trial at 57ºN</td>
<td>University of Aberdeen</td>
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<td>N05081</td>
<td>Vitamin D sufficiency and health</td>
<td>University College Cork</td>
<td>01/03/2008</td>
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<td>N05083</td>
<td>Biomarker discovery for the assessment of zinc status</td>
<td>Rowett Institute of Nutrition and Health, University of Aberdeen</td>
<td>01/06/2009</td>
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<tr>
<td>N05084</td>
<td>Development of a dose-responsive biological marker for sucrose intake based on metabolomics and machine learning</td>
<td>Cranfield University</td>
<td>01/06/2009</td>
<td>01/07/2011</td>
<td>213,248.33</td>
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<tr>
<td>N05086</td>
<td>A comprehensive longitudinal study of diet and chronic low-grade systemic inflammation in a well-characterized population of postmenopausal women</td>
<td>University of Aberdeen</td>
<td>01/09/2009</td>
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<td>N05087</td>
<td>Is serum amyloid-A a sensitive measure of decreased inflammation following increased fruit and vegetable intake?</td>
<td>Queens University, Belfast</td>
<td>01/03/2010</td>
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Total: 1,789,856.33
### N08 – Dietary surveys and food composition (research)

**Programme contact** – Mrs Gillian Swan  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
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<td>N08027</td>
<td>Portion size assessment tools for use with children – further development and validation</td>
<td>University of Newcastle</td>
<td>01/07/2007</td>
<td>31/03/2010</td>
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<td>N08029</td>
<td>How can we standardise the measurement of plasma 25 (OH)D in national surveys? A strategy to produce a consensus position paper for NDNS and SACN</td>
<td>Ashwell Associates</td>
<td>01/04/2009</td>
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</table>

**Total:** 101,653.00

† This area of work will be transferring to the Department of Health later in 2010

### N09 – Food acceptability and choice

**Programme contact** – Mr Jamie Blackshaw  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
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<th>End Date</th>
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<tbody>
<tr>
<td>N09025</td>
<td>Food choice and changes in body weight and shape after smoking cessation</td>
<td>University of Glasgow</td>
<td>01/09/2007</td>
<td>28/02/2010</td>
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<td>N09028</td>
<td>Review of reviews – Understanding the effectiveness of dietary and food choice interventions</td>
<td>Oxford Evidentia</td>
<td>01/02/2010</td>
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</table>

**Total:** 297,120.00
## N10 – Dietary surveys and nutrients in food – surveillance†

Programme contact – Mrs Gillian Swan  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
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<th>Project</th>
<th>Project Title</th>
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<tr>
<td>N10036</td>
<td>National Diet and Nutrition Survey Rolling Programme</td>
<td>National Centre for Social Research (NCSR)</td>
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<td>31/03/2013</td>
<td>2,728,887.00</td>
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<td>N10039</td>
<td>Nutrient analysis survey of biscuits, buns, cakes and pastries</td>
<td>BBSRC – Institute of Food Research</td>
<td>01/06/2008</td>
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<td>N10041</td>
<td>The Diet and Nutrition Survey of Infants and Young Children (DNSIYC)</td>
<td>Medical Research Council – Human Nutrition Research</td>
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**Total:** 3,175,531.00

† This area of work will be transferring to the Department of Health later in 2010

## N12 – Diet and colonic health†

Programme contact – Ms Rachel Elsom  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N12013</td>
<td>Further development of a non-invasive biomarker to monitor gastro-intestinal health with special emphasis on reduction of risk of colon cancer (BIOMICS)</td>
<td>University of Friedrich-Schiller</td>
<td>01/09/2004</td>
<td>31/12/2009</td>
<td>40,520.33</td>
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<tr>
<td>N12017</td>
<td>Protein acetylation as a diet-modifiable biomarker of colorectal cancer risk</td>
<td>University of Sheffield</td>
<td>01/07/2006</td>
<td>04/12/2009</td>
<td>95,880.00</td>
</tr>
</tbody>
</table>

**Total:** 136,400.33

† This area of work will be transferring to the Department of Health later in 2010
### N14 – Food choice inequalities†

Programme contact – Mr Jamie Blackshaw  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N14008</td>
<td>Middlesbrough on the move: The effectiveness of a community challenge to promote healthy diets and levels of physical activity</td>
<td>University of Durham</td>
<td>08/12/2006</td>
<td>30/09/2009</td>
<td>127,069.39</td>
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<tr>
<td>N14010</td>
<td>Implementing healthier menus in residential care homes for older people: evaluation of barriers, facilitators and the impact on dietary intake</td>
<td>University of Newcastle</td>
<td>07/01/2008</td>
<td>06/01/2011</td>
<td>251,664.00</td>
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**Total:** 378,733.39

† This area of work will be transferring to the Department of Health later in 2010

### P01 – Marine microbiology and biotoxins

Programme contact – Mr David Alexander, Tel: 020 7276 8949  
Email: david.alexander@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>P01005</td>
<td>Validation of a LC-MS method for the determination of lipophilic toxins in UK commercial shellfish</td>
<td>CEFAS – Weymouth</td>
<td>21/01/2008</td>
<td>31/12/2010</td>
<td>51,382.00</td>
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<tr>
<td>P01008</td>
<td>Development and certification of tissue and calibration solution, certified reference materials (CRMs) for paralytic shellfish poisoning (PSP) toxins</td>
<td>National Research Council, Canada</td>
<td>20/02/2008</td>
<td>25/03/2010</td>
<td>8,000.00</td>
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<tr>
<td>P01009</td>
<td>Investigation into the prevalence, distribution and levels of norovirus titre in oyster harvesting areas in the UK</td>
<td>CEFAS – Weymouth</td>
<td>15/09/2008</td>
<td>28/02/2011</td>
<td>263,821.00</td>
</tr>
</tbody>
</table>

**Total:** 323,203.00
**Q01 – Food authenticity (research)**

Programme contact – Dr Nigel Harrison  
Email: cst@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title*</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>Q01105</td>
<td>Proteomic detection and quantification of offal</td>
<td>University of Nottingham Trent</td>
<td>01/09/2006</td>
<td>31/08/2010</td>
<td>45,744.00</td>
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<tr>
<td>Q01121</td>
<td>TRACE – Tracing Food Commodities in Europe</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/04/2007</td>
<td>31/03/2010</td>
<td>78,974.20</td>
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<tr>
<td>Q01122</td>
<td>Measurement of theobromine content in cocoa to determine cocoa solids in chocolate</td>
<td>Durham County Council Scientific Services</td>
<td>01/04/2008</td>
<td>30/04/2010</td>
<td>55,682.00</td>
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<tr>
<td>Q01123</td>
<td>Confirming the origin of British beef using multi-isotope and multi-element analysis</td>
<td>BBSRC – Institute of Food Research</td>
<td>03/12/2007</td>
<td>31/03/2010</td>
<td>107,506.79</td>
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<tr>
<td>Q01124</td>
<td>Assessing the origin of wine using existing compositional information</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/12/2007</td>
<td>31/05/2009</td>
<td>30,198.00</td>
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<tr>
<td>Q01126</td>
<td>TRACE – Tracing Food Commodities in Europe</td>
<td>BBSRC – Institute of Food Research</td>
<td>01/04/2007</td>
<td>02/02/2010</td>
<td>24,929.65</td>
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<tr>
<td>Q01128</td>
<td>Development of markers for potato genotyping for use in the agilent bioanalyser</td>
<td>National Institute of Agricultural Botany (NIAB)</td>
<td>01/01/2009</td>
<td>31/10/2009</td>
<td>12,438.00</td>
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<tr>
<td>Q01129</td>
<td>The development and validation of DNA marker methods for the verification of meat from wild boar</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/01/2009</td>
<td>30/09/2009</td>
<td>20,396.00</td>
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<tr>
<td>Q01130</td>
<td>Verification of meat from traditional cattle and pig breeds using SNP DNA markers</td>
<td>Gen-Probe Life Sciences Limited</td>
<td>01/10/2008</td>
<td>30/11/2010</td>
<td>71,000.00</td>
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<tr>
<td>Q01131</td>
<td>Extend an existing method using light microscopy to determine whether material recovered off beef and lamb bones meets the definition of MSM</td>
<td>Leatherhead Food International</td>
<td>01/04/2009</td>
<td>30/04/2010</td>
<td>36,296.00</td>
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* Where there is more than one project with the same title, each code represents a different work stream

† This area of work transferred to Defra on 20 July 2010

Total: **483,164.64**
## R04 – Radioactivity in food ‡
Programme contact – Mr Paul Tossell, Tel: 020 7276 8750
Email: paul.tossell@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
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<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>N08021</td>
<td>Total diet study</td>
<td>BMRB</td>
<td>01/01/2008</td>
<td>31/12/2009</td>
<td>23,160.00</td>
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<tr>
<td>N08022</td>
<td>Total diet study</td>
<td>BBSRC – Institute of Food Research</td>
<td>01/01/2008</td>
<td>31/12/2009</td>
<td>68,484.26</td>
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<td><strong>Total: 91,644.26</strong></td>
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## S14 – FSA Scotland – research and surveillance
Programme contact – Dr Anna Whyte, Tel: 01224 285 119
Email: anna.whyte@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
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<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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</thead>
<tbody>
<tr>
<td>S14004</td>
<td>Factors associated with geographic and temporal variation in campylobacteriosis infections in humans in Scotland</td>
<td>University of Glasgow</td>
<td>01/08/2006</td>
<td>30/06/2009</td>
<td>66,139.00</td>
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<tr>
<td>S14006</td>
<td>The molecular epidemiology of Scottish <em>Campylobacter</em> isolates from human cases of infection using Multilocus Sequence Typing (MLST)</td>
<td>University of Aberdeen</td>
<td>01/06/2005</td>
<td>30/06/2009</td>
<td>14,642.00</td>
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<tr>
<td>S14008</td>
<td>Presence of Anisakine worms in Scottish fisheries (wild salmon extension)</td>
<td>University of Stirling</td>
<td>01/07/2005</td>
<td>28/10/2009</td>
<td>9,652.50</td>
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<tr>
<td>S14035</td>
<td>Secondary analysis of the expenditure and food survey – comparison of household food and eating out data with the Scottish dietary targets and by area of residence</td>
<td>University of Dundee – Ninewells</td>
<td>01/03/2007</td>
<td>30/10/2011</td>
<td>74,242.00</td>
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<tr>
<td>S14044</td>
<td>Identification of <em>Alexandrium</em> sp using FISH analysis</td>
<td>Scottish Association for Marine Science</td>
<td>01/08/2008</td>
<td>01/09/2009</td>
<td>16,606.00</td>
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<tr>
<td>S14047</td>
<td>Scottish urinary sodium survey 2009</td>
<td>Scottish Centre for Social Research</td>
<td>01/12/2008</td>
<td>31/03/2010</td>
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‡ The projects listed here provide information on contaminants in the diet
<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S14048</td>
<td>The eatwell week sample menu: the application of eatwell plate advice to weekly food intake</td>
<td>University of Glasgow</td>
<td>01/11/2009</td>
<td>30/04/2011</td>
<td>41,160.62</td>
</tr>
<tr>
<td>S14049</td>
<td>Effect of feed on <em>E. coli</em> O157 shedding in ruminants and source attribution of human infection using MLVA typing</td>
<td>University of Aberdeen</td>
<td>01/10/2009</td>
<td>30/09/2012</td>
<td>2,500.00</td>
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<tr>
<td>S14050</td>
<td>Survey of diet, influences on food choices and eating practices among children in Scotland in 2010</td>
<td>University of Aberdeen</td>
<td>05/01/2010</td>
<td>31/12/2011</td>
<td>72,865.63</td>
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<tr>
<td>S14051</td>
<td>Evaluation of progress made by Scottish SME’s with the voluntary withdrawal of the ‘Southampton six’ colours from food products</td>
<td>IPSOS MORI</td>
<td>05/01/2010</td>
<td>31/03/2010</td>
<td>24,902.45</td>
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<td></td>
<td><strong>Total:</strong> 482,710.20</td>
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</table>

**T01 – Risk assessment**

Programme contact – Dr David Gott, Tel: 020 7276 8535
Email: david.gott@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>T01034</td>
<td>Risk assessment of dietary dioxins</td>
<td>University of Nottingham</td>
<td>01/09/2003</td>
<td>31/03/2012</td>
<td>9,704.00</td>
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<tr>
<td>T01042</td>
<td>Quality of life – integrated benefit and risk analysis: Web-based tool for assessing food safety and health benefits</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/08/2006</td>
<td>30/06/2010</td>
<td>60,491.00</td>
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<tr>
<td>T01045</td>
<td>The assessment of joint endocrine effects of multi-component mixtures of food contaminants and additives</td>
<td>University of London, School of Pharmacy</td>
<td>01/03/2007</td>
<td>31/08/2010</td>
<td>121,774.00</td>
</tr>
<tr>
<td>T01051</td>
<td>Interpretation of margins of exposure for genotoxic carcinogens</td>
<td>Imperial College, London</td>
<td>01/01/2010</td>
<td>30/04/2012</td>
<td>31,604.00</td>
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<tr>
<td>T01052</td>
<td>Genotoxic consequences of exposure to mixtures of food-derived chemical carcinogens</td>
<td>Imperial College, London</td>
<td>01/10/2009</td>
<td>30/10/2010</td>
<td>66,405.00</td>
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<tr>
<td>Project</td>
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<td>Start Date</td>
<td>End Date</td>
<td>Expenditure in FY 2009/10 (£)</td>
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<tr>
<td>T01054</td>
<td>Development of a food product with and without Aspartame suitable for a double blind placebo controlled clinical trial</td>
<td>Hull York Medical School</td>
<td>01/05/2009</td>
<td>28/02/2011</td>
<td>253,427.00</td>
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<tr>
<td>T01055</td>
<td>Caffeine matching genotype and caffeine metabolism phenotype from a cohort of pregnant women</td>
<td>University of Leeds</td>
<td>01/04/2009</td>
<td>30/03/2010</td>
<td>80,000.00</td>
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<tr>
<td>T01056</td>
<td>Development of a framework for evaluation and expression of uncertainties in hazard and risk assessment</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/08/2009</td>
<td>30/06/2010</td>
<td>33,700.00</td>
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<tr>
<td>T01057</td>
<td>A double-blind placebo controlled parallel trial of soy phytoestrogens in patients with compensated hypogonadism</td>
<td>Hull and East Yorkshire Hospitals Trust</td>
<td>01/10/2009</td>
<td>31/05/2012</td>
<td>233,940.00</td>
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<tr>
<td>T01061</td>
<td>Human in vivo and in vitro studies on gastrointestinal absorption of nanoparticles: the effect of size and surface properties</td>
<td>Health and Safety Laboratory – Sheffield</td>
<td>01/02/2010</td>
<td>14/05/2012</td>
<td>45,548.00</td>
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<tr>
<td>T01062</td>
<td>A study of the toxicokinetics of selected nanomaterials following oral intake</td>
<td>Food and Environment Research Agency (FERA)</td>
<td>01/09/2009</td>
<td>16/03/2012</td>
<td>24,246.00</td>
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<tr>
<td>T01063</td>
<td>Toxicodynamics of dioxins in an obese population</td>
<td>University of Hull</td>
<td>01/02/2010</td>
<td>31/08/2011</td>
<td>251,682.00</td>
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<td><strong>Total</strong>: 1,212,521.00</td>
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</tbody>
</table>

**T05 – Phytoestrogens in the diet**
Programme contact – Dr David Gott, Tel: 020 7276 8535
Email: david.gott@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
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<tbody>
<tr>
<td>T05029</td>
<td>A double blind placebo controlled crossover trial of soy phytoestrogens in patients with compensated hypothyroidism</td>
<td>University of Hull</td>
<td>03/01/2005</td>
<td>31/07/2011</td>
<td>42,000.00</td>
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<tr>
<td>T07042</td>
<td>Longitudinal study of T cell responses in development and resolution of food allergy</td>
<td>University of Cambridge</td>
<td>01/07/2004</td>
<td>31/05/2010</td>
<td>22,030.00</td>
</tr>
<tr>
<td>T07046</td>
<td>The prevalence of food allergy and weaning practices in a birth cohort of UK infants</td>
<td>University of Southampton</td>
<td>01/08/2005</td>
<td>30/09/2010</td>
<td>122,226.01</td>
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<tr>
<td>T07049</td>
<td>Characterisation of the immune mechanisms involved in the induction of oral tolerance to peanuts in children</td>
<td>King’s College London</td>
<td>01/07/2007</td>
<td>01/12/2012</td>
<td>168,598.75</td>
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<tr>
<td>T07051</td>
<td>Randomized controlled trial of early introduction of allergenic foods to induce tolerance in infants – the EAT study</td>
<td>King’s College London</td>
<td>15/01/2008</td>
<td>31/01/2015</td>
<td>93,505.63</td>
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<tr>
<td>T07058</td>
<td>Understanding the dietary patterns and food choice reasoning of nut allergic consumers</td>
<td>University of Surrey</td>
<td>01/01/2009</td>
<td>31/03/2010</td>
<td>188,683.00</td>
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<tr>
<td>T07059</td>
<td>Consumer understanding of new labelling terms for foods marketed for people with gluten intolerance</td>
<td>COI</td>
<td>18/02/2009</td>
<td>30/04/2009</td>
<td>8,645.00</td>
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<tr>
<td>T07060</td>
<td>Investigation of the association of skin barrier structure and function and the development of sensitisation to food allergens. A prospective birth cohort study</td>
<td>University College Cork</td>
<td>15/07/2009</td>
<td>01/09/2013</td>
<td>130,808.51</td>
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<tr>
<td>T07061</td>
<td>Trialling of revised peanut advice with consumers and health professionals</td>
<td>The People Partnership</td>
<td>21/04/2009</td>
<td>30/06/2009</td>
<td>32,200.00</td>
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<tr>
<td>T07062</td>
<td>Management of food allergens: from threshold doses to analysis in foods</td>
<td>Institute of Food Research Enterprises Ltd</td>
<td>23/12/2009</td>
<td>30/09/2011</td>
<td>25,000.00</td>
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</table>
### Project Title: Guidance on the provision of allergen information for non pre-packed foods evaluation

- **Organisation:** COI
- **Start Date:** 12/01/2010
- **End Date:** 30/04/2010
- **Expenditure:** £42,460.00

### Project Title: Understanding of the food labelling terms ‘lactose free’, ‘milk free’ and ‘dairy free’ by consumers, health professionals and food businesses

- **Organisation:** COI
- **Start Date:** 25/01/2010
- **End Date:** 31/03/2010
- **Expenditure:** £47,261.00

**Total: £881,417.90**

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### T10 – Risk assessment of mixtures of pesticides and similar substances

**Programme contact – Mr Barry Maycock, Tel: 020 7276 8523**

**Email: barry.maycock@foodstandards.gsi.gov.uk**

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
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<tbody>
<tr>
<td>T10008</td>
<td>Dose-response and mixture response of pesticides <em>in vitro</em> and <em>in vivo</em></td>
<td>Health and Safety Laboratory – Sheffield</td>
<td>01/01/2005</td>
<td>31/03/2009</td>
<td>£34,304.00</td>
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<tr>
<td>T10014</td>
<td>A study to identify small metabolite biomarkers of effect following exposure to single or mixtures of pesticides</td>
<td>Centre for Ecology and Hydrology (CEH)</td>
<td>01/11/2006</td>
<td>31/10/2009</td>
<td>£168,251.59</td>
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<tr>
<td>T10019</td>
<td>The effects of storage time, preparation and cooking method on residual pesticide levels in apples and potatoes treated with a suite of commonly used permitted pesticides</td>
<td>Queens University, Belfast</td>
<td>01/07/2006</td>
<td>31/12/2009</td>
<td>£87,270.00</td>
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<tr>
<td>T10020</td>
<td>Application of protein profiles to identify common mechanism groups of pyrethrins and pyrethroids</td>
<td>Imperial College, London</td>
<td>14/08/2006</td>
<td>13/08/2009</td>
<td>£93,151.77</td>
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<tr>
<td>T10021</td>
<td>Immunoassay detection of urinary biomarkers of pesticide exposure</td>
<td>ADAS Consulting</td>
<td>01/07/2006</td>
<td>30/06/2009</td>
<td>£76,874.00</td>
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</table>

**Total: £459,851.36**
#### Social science

Programme contact – Dr Siân Thomas, Tel: 020 7276 8761  
Email: sian.thomas@foodstandards.gsi.gov.uk

<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
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<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X03004</td>
<td>Scoping study on attitudes and behaviours towards food</td>
<td>Policy Studies Institute</td>
<td>14/05/2009</td>
<td>27/07/2009</td>
<td>26,895.00</td>
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<tr>
<td>X03005</td>
<td>Quarterly Public Attitudes Tracker</td>
<td>TNS Global</td>
<td>08/06/2009</td>
<td>15/03/2010</td>
<td>50,000.00</td>
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<tr>
<td>X03006</td>
<td>Food Issues Survey</td>
<td>TNS – BMRB</td>
<td>01/08/2009</td>
<td>09/12/2010</td>
<td>251,968.00</td>
</tr>
<tr>
<td>X03008</td>
<td>ESRC collaborative project: Understanding society</td>
<td>Economic and Social Research Council (ESRC)</td>
<td>01/09/2009</td>
<td>31/08/2012</td>
<td>50,000.00</td>
</tr>
<tr>
<td>X03010</td>
<td>ESRC strategic partnership</td>
<td>Institute of Education</td>
<td>01/10/2009</td>
<td>20/09/2011</td>
<td>80,000.00</td>
</tr>
<tr>
<td>X04002</td>
<td>Exploring attitudes to GM foods: BSA follow up interviews and workshops</td>
<td>National Centre for Social Research (NatCen)</td>
<td>01/05/2009</td>
<td>31/10/2009</td>
<td>90,645.50</td>
</tr>
<tr>
<td>X04003</td>
<td>Literature review – organisational behaviour change</td>
<td>King’s College London</td>
<td>01/05/2009</td>
<td>14/06/2010</td>
<td>42,235.00</td>
</tr>
<tr>
<td>X04008</td>
<td>Evidence review on regulation cultures and behaviours</td>
<td>Institute of Employment Studies</td>
<td>09/11/2009</td>
<td>20/08/2010</td>
<td>30,000.00</td>
</tr>
<tr>
<td>X06001</td>
<td>Evidence review of public attitudes towards, and use of, general food labelling</td>
<td>Oxford Evidencia</td>
<td>14/04/2009</td>
<td>21/07/2009</td>
<td>27,958.62</td>
</tr>
<tr>
<td>X06002</td>
<td>Attitudes towards, and understanding of, country of origin labelling using omnibus</td>
<td>National Centre for Social Research (NatCen)</td>
<td>08/06/2009</td>
<td>28/09/2009</td>
<td>31,690.00</td>
</tr>
<tr>
<td>X06003</td>
<td>Research exploring public understanding of sodium and salt labelling</td>
<td>The People Partnership</td>
<td>26/10/2009</td>
<td>08/03/2010</td>
<td>45,789.00</td>
</tr>
<tr>
<td>A01073</td>
<td>Survey on the consumption of cinnamon-containing foods and drinks by the UK population</td>
<td>University of Leeds</td>
<td>16/02/2009</td>
<td>30/06/2010</td>
<td>67,250.00</td>
</tr>
</tbody>
</table>

* Some projects have been listed under other specific programmes but are also listed here because they are social science research
<table>
<thead>
<tr>
<th>Project</th>
<th>Project Title</th>
<th>Organisation</th>
<th>Start Date</th>
<th>End Date</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B13008</td>
<td>An investigation into the attitudes and behaviours of consumers and caregivers in the preparation, handling, storage and feeding of powdered infant formula inside and outside the home</td>
<td>University of Wales Institute, Cardiff</td>
<td>01/05/2007</td>
<td>31/12/2009</td>
<td>21,085.20</td>
</tr>
<tr>
<td>E03010</td>
<td>Evaluation of effectiveness and cost benefit of two different enforcement regimes in meat plants</td>
<td>ADAS Consulting</td>
<td>01/08/2006</td>
<td>31/10/2009</td>
<td>34,480.00</td>
</tr>
<tr>
<td>L01004</td>
<td>Survey of the uptake of Food Standards Agency guidance on country of origin labelling</td>
<td>Campden Technology Ltd.</td>
<td>27/04/2009</td>
<td>30/09/2009</td>
<td>78,378.00</td>
</tr>
<tr>
<td>N08027</td>
<td>Portion size assessment tools for use with children – further development and validation</td>
<td>University of Newcastle</td>
<td>01/07/2007</td>
<td>31/03/2009</td>
<td>99,913.00</td>
</tr>
<tr>
<td>N09025</td>
<td>Food choice and changes in body weight and shape after smoking cessation</td>
<td>University of Glasgow</td>
<td>01/09/2007</td>
<td>28/02/2010</td>
<td>250,120.00</td>
</tr>
<tr>
<td>N09028</td>
<td>Review of reviews – Understanding the effectiveness of dietary and food choice interventions</td>
<td>Oxford Evidentia</td>
<td>01/02/2010</td>
<td>06/09/2010</td>
<td>47,000.00</td>
</tr>
<tr>
<td>N14008</td>
<td>Middlesbrough on the move: The effectiveness of a community challenge to promote healthy diets and levels of physical activity</td>
<td>University of Durham</td>
<td>08/12/2006</td>
<td>30/09/2009</td>
<td>127,069.39</td>
</tr>
<tr>
<td>N14010</td>
<td>Implementing healthier menus in residential care homes for older people: evaluation of barriers, facilitators and the impact on dietary intake</td>
<td>University of Newcastle</td>
<td>07/01/2008</td>
<td>06/01/2011</td>
<td>251,664.00</td>
</tr>
<tr>
<td>S14035</td>
<td>Secondary analysis of the expenditure and food survey – comparison of household food and eating out data with the Scottish dietary targets and by area of residence</td>
<td>University of Dundee – Ninewells</td>
<td>01/03/2007</td>
<td>30/10/2011</td>
<td>74,242.00</td>
</tr>
<tr>
<td>Project</td>
<td>Project Title</td>
<td>Organisation</td>
<td>Start Date</td>
<td>End Date</td>
<td>Expenditure in FY 2009/10 (£)</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------</td>
<td>------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>T07058</td>
<td>Understanding the dietary patterns and food choice reasoning of food allergic consumers</td>
<td>University of Surrey</td>
<td>01/01/2009</td>
<td>31/01/2010</td>
<td>188,683.00</td>
</tr>
<tr>
<td>T07059</td>
<td>Consumer understanding of new labelling terms for foods marketed for people with gluten intolerance</td>
<td>COI</td>
<td>18/02/2009</td>
<td>30/04/2009</td>
<td>8,645.00</td>
</tr>
<tr>
<td>T07061</td>
<td>Trialling of revised peanut advice with consumers and health professionals</td>
<td>The People Partnership</td>
<td>21/04/2009</td>
<td>30/06/2009</td>
<td>32,200.00</td>
</tr>
<tr>
<td>T07063</td>
<td>Guidance on the provision of allergen information for non pre-packed foods evaluation</td>
<td>COI</td>
<td>12/01/2010</td>
<td>30/04/2010</td>
<td>42,460.00</td>
</tr>
<tr>
<td>T07064</td>
<td>Understanding of the food labelling terms ‘lactose free’, ‘milk free’ and ‘dairy free’ by consumers, health professionals and food businesses</td>
<td>COI</td>
<td>25/01/2010</td>
<td>31/03/2010</td>
<td>47,261.00</td>
</tr>
</tbody>
</table>

### Other science and evidence spend

<table>
<thead>
<tr>
<th>Description</th>
<th>Expenditure in FY 2009/10 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiological monitoring</td>
<td>2,486,460.07</td>
</tr>
<tr>
<td>Food incidents</td>
<td>199,194.79</td>
</tr>
<tr>
<td>Radiological emergency response</td>
<td>82,289.00</td>
</tr>
<tr>
<td>Development and support of external knowledge and skills</td>
<td>189,869.95</td>
</tr>
<tr>
<td>Shellfish monitoring</td>
<td>4,192,943.44</td>
</tr>
<tr>
<td>External portfolio support (workshops, appraisals, etc.)</td>
<td>330,022.00</td>
</tr>
<tr>
<td>Analysis commissioned to support Scientific Advisory Committee on Nutrition risk assessments</td>
<td>78,008.00</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>7,558,787.25</strong></td>
</tr>
</tbody>
</table>
### Table 1: Projects co-funded by the Agency under the BBSRC Government Partnerships Award Scheme*

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>B15015</td>
<td>Host acute stress responses and the regulation of <em>Campylobacter jejuni</em> virulence in the avian gut</td>
<td>01/11/06</td>
<td>31/10/09</td>
</tr>
<tr>
<td>B15016</td>
<td></td>
<td>08/01/07</td>
<td>31/01/10</td>
</tr>
<tr>
<td>B15017</td>
<td></td>
<td>01/11/06</td>
<td>31/10/09</td>
</tr>
<tr>
<td>B15021</td>
<td>A nitric oxide responsive network in <em>Campylobacter jejuni</em>, its role in intracellular survival and resistance to nitrosative stresses</td>
<td>01/06/07</td>
<td>31/05/10</td>
</tr>
<tr>
<td>B15022</td>
<td></td>
<td>01/03/07</td>
<td>28/02/10</td>
</tr>
<tr>
<td>B15027</td>
<td>Molecular mechanisms underlying the interaction of <em>Salmonella Enteritidis</em> with the hen oviduct and survival in eggs</td>
<td>01/09/08</td>
<td>31/08/11</td>
</tr>
<tr>
<td>B15028</td>
<td></td>
<td>01/03/08</td>
<td>12/03/11</td>
</tr>
</tbody>
</table>

### Table 2: Co-funded projects in the EU framework programmes 6 and 7*

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Title</th>
<th>Full Title</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>N12013</td>
<td>SEAFOODPLUS</td>
<td>Further development of a non-invasive biomarker to monitor gastro-intestinal health with special emphasis on reduction of risk of colon cancer (BIOMICS)</td>
<td>01/09/04</td>
<td>31/12/09</td>
</tr>
<tr>
<td>Q01121</td>
<td>TRACE</td>
<td>TRACE – Tracing food commodities in Europe</td>
<td>01/04/07</td>
<td>31/03/10</td>
</tr>
<tr>
<td>Q01126</td>
<td></td>
<td></td>
<td>01/04/07</td>
<td>02/02/10</td>
</tr>
<tr>
<td>T01042</td>
<td>QALIBRA</td>
<td>Quality of life – integrated benefit and risk analysis: Web-based tool for assessing food safety and health benefits</td>
<td>01/08/06</td>
<td>30/06/10</td>
</tr>
<tr>
<td>T07046</td>
<td>EUROPREVALL</td>
<td>The prevalence of food allergy and weaning practices in a birth cohort of UK infants</td>
<td>01/08/05</td>
<td>30/09/10</td>
</tr>
<tr>
<td>B18027</td>
<td>VITAL</td>
<td>Integrated monitoring and control of foodborne viruses in European food supply chains</td>
<td>01/04/08</td>
<td>31/03/11</td>
</tr>
<tr>
<td>A03071</td>
<td>FACET</td>
<td>Flavouring, additives and food contact material exposure task</td>
<td>01/09/08</td>
<td>31/08/12</td>
</tr>
</tbody>
</table>

**Key:**

Projects co-funded in EU framework programme 6

Projects co-funded in EU framework programme 7
### Table 3  Other co-funded projects

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Co-funder(s)</th>
<th>Full Title</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>B14016</td>
<td>BfR (Germany), Ministry of Agriculture (NL), Friedrich Loeffler Institute</td>
<td>The role of commensal microflora of animals in the transmission of Extended Spectrum Beta-lactamases (ESBLs)</td>
<td>01/04/09</td>
<td>31/03/11</td>
</tr>
<tr>
<td>B14017</td>
<td></td>
<td></td>
<td>01/10/09</td>
<td>31/03/11</td>
</tr>
<tr>
<td>B15018</td>
<td>Defra</td>
<td>National flock prevalence survey for <em>Campylobacter</em></td>
<td>01/10/06</td>
<td>31/05/10</td>
</tr>
<tr>
<td>B18021</td>
<td>DH, NHS</td>
<td>The second study of infectious intestinal disease in the community (IID2) – determining disease burden and calibrating national surveillance data in the United Kingdom</td>
<td>01/04/06</td>
<td>03/03/10</td>
</tr>
<tr>
<td>ER1006</td>
<td>EA, HSE</td>
<td>Radiological assessments by ‘habits’ survey</td>
<td>01/04/07</td>
<td>31/03/12</td>
</tr>
<tr>
<td>G03032</td>
<td>BVL</td>
<td>GMOseek: The development of screening methods for GMOs</td>
<td>01/06/09</td>
<td>31/05/11</td>
</tr>
<tr>
<td>MS0009</td>
<td>Horticultural Development Company (HDC)</td>
<td>Knowledge transfer from FSA funded research (B17007) and HDC funded research</td>
<td>01/01/10</td>
<td>31/11/10</td>
</tr>
<tr>
<td>N05085</td>
<td>DH</td>
<td>A systematic review of the evidence of the benefits and risks of different dietary carbohydrates on cardio-metabolic health and disease (including cardiovascular disease, diabetes, insulin resistance, glycemic response and obesity)</td>
<td>01/05/09</td>
<td>30/06/11</td>
</tr>
<tr>
<td>N10036</td>
<td>DH, Safefood, DHSSPS</td>
<td>National diet and nutrition survey (NDNS) rolling programme</td>
<td>24/04/06</td>
<td>31/03/13</td>
</tr>
<tr>
<td>N10041</td>
<td>DH</td>
<td>Diet and nutrition survey of infants and young children</td>
<td>29/07/09</td>
<td>31/08/12</td>
</tr>
<tr>
<td>P01008</td>
<td>National Research Council, Canada</td>
<td>Development and certification of tissue and calibration solution, certified reference materials (CRMs) for paralytic shellfish poisoning (PSP) toxins</td>
<td>20/02/08</td>
<td>25/03/10</td>
</tr>
<tr>
<td>Project Code</td>
<td>Co-funder(s)</td>
<td>Full Title</td>
<td>Start Date</td>
<td>End Date</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>S14035 part 1</td>
<td>Scottish Government</td>
<td>Secondary analysis of Scottish dietary data from the Expenditure and Food Survey (EFS)</td>
<td>01/03/07</td>
<td>31/10/09</td>
</tr>
<tr>
<td>S14035 part 2</td>
<td>Scottish Government</td>
<td>Secondary analysis of Scottish dietary data from EFS</td>
<td>01/11/09</td>
<td>31/10/11</td>
</tr>
<tr>
<td>S14047</td>
<td>Scottish Government</td>
<td>Scottish urinary sodium survey 2009</td>
<td>01/12/08</td>
<td>31/03/10</td>
</tr>
<tr>
<td>S14049</td>
<td>University of Aberdeen, QMS and NFUS</td>
<td>Effect of feed on E. coli O157 shedding in ruminants and source attribution of human infection using MLVA typing</td>
<td>01/10/09</td>
<td>01/09/12</td>
</tr>
<tr>
<td>S14050</td>
<td>Scottish Government</td>
<td>Survey of childrens diets in Scotland</td>
<td>21/12/09</td>
<td>23/12/11</td>
</tr>
<tr>
<td>SPIN 153</td>
<td>Scottish Government</td>
<td>Analysis of vitamin D in blood plasma samples from the Scottish Health Survey in 2010 and 2011</td>
<td>01/02/10</td>
<td>01/04/11</td>
</tr>
<tr>
<td>T07051</td>
<td>MRC, KCL</td>
<td>Randomised controlled trial of early introduction of allergenic foods to induce tolerance in infants</td>
<td>15/01/08</td>
<td>31/01/15</td>
</tr>
<tr>
<td>T07061</td>
<td>DH</td>
<td>Trialling of revised peanut advice with consumers and health professionals</td>
<td>21/04/09</td>
<td>30/06/09</td>
</tr>
<tr>
<td>X03008</td>
<td>ESRC, OGD consortium, Large Facilities Capital Fund</td>
<td>Understanding society longitudinal survey</td>
<td>01/11/09</td>
<td>31/03/12</td>
</tr>
<tr>
<td>**</td>
<td>NPRI (round 2)</td>
<td>Smart phone: promoting weight loss and improved health using mobile phone technology</td>
<td>01/01/10</td>
<td>30/06/12</td>
</tr>
<tr>
<td>**</td>
<td>NPRI (round 2)</td>
<td>Randomised controlled trial of habit-based advice for weight control in general practice</td>
<td>22/03/10</td>
<td>21/03/15</td>
</tr>
<tr>
<td>**</td>
<td>DH</td>
<td>Effectiveness of controls on infant formula and follow-on formula</td>
<td>01/10/08</td>
<td>01/07/09</td>
</tr>
</tbody>
</table>

* Where there is more than one project code, each code represents a different workstream
** Project code not applicable – managed by other partners
### Glossary of co-funders

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBSRC</td>
<td>Biotechnology and Biological Sciences Research Council</td>
</tr>
<tr>
<td>BFR</td>
<td>Federal Institute for Risk Assessment – Germany</td>
</tr>
<tr>
<td>BVL</td>
<td>The Federal Office of Consumer Protection and Food Safety – Germany</td>
</tr>
<tr>
<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
</tr>
<tr>
<td>DH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DHSSPH</td>
<td>Department of Health, Social Services and Public Safety, NI</td>
</tr>
<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>EFSA</td>
<td>European Food Safety Authority</td>
</tr>
<tr>
<td>ERANET</td>
<td>Networking of national research programmes in the European Research Area</td>
</tr>
<tr>
<td>ESRC</td>
<td>Economic and Social Research Council</td>
</tr>
<tr>
<td>HSE</td>
<td>Health and Safety Executive</td>
</tr>
<tr>
<td>KCL</td>
<td>King’s College London</td>
</tr>
<tr>
<td>MRC</td>
<td>Medical Research Council</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NFUS</td>
<td>National Farmers Union, Scotland</td>
</tr>
<tr>
<td>NPRI</td>
<td>National Prevention Research Initiative</td>
</tr>
<tr>
<td>OGD</td>
<td>Other government departments</td>
</tr>
<tr>
<td>QMS</td>
<td>Quality Meat Scotland</td>
</tr>
</tbody>
</table>
The following is a list of publications for the financial year 2009/10 arising from research funded by the Agency

**A03 – Chemical contaminants from food contact materials and articles (research)**


**B18 – Microbiological surveillance**


**C03 – Mycotoxins and process contaminants (including nitrate) (research)**


M01 – Meat hygiene – microbiological safety (non-TSE research)

M03 – Meat hygiene (TSE)

N02 – Diet and cardiovascular health

**N05 – Nutritional status and function**


**N08 – Dietary surveys and food composition (research)**


**N09 – Food acceptability and choice**


**N12 – Diet and colonic health**


Q01 – Food authenticity (research)


S14 Scotland (research and surveillance)


**Publications associated with S04005**


T01 – Risk assessment


T07 – Food intolerance


Publications – postgraduate studentship

PG 1006


Publications from the biotoxin/algal monitoring programme (PAU179a/S02007)

### Annexe D – Our scientific advisory committees†

More information is available through [www.food.gov.uk](http://www.food.gov.uk)

<table>
<thead>
<tr>
<th>Name of committee</th>
<th>Remit</th>
</tr>
</thead>
</table>
| General Advisory Committee on Science (GACS)                          | • provides independent challenge and advice on general science issues  
• supports and challenges on science strategy and governance  
• provides advice and horizon scanning on areas not covered by other committees |
| Social Science Research Committee (SSRC)                              | • provides access to social science expertise and challenge for the Agency and other scientific advisory committees |
| Advisory Committee on Animal Feedingstuffs (ACAF)                    | • advises on the safety and use of animal feeds and feeding practices, with an emphasis on protecting human health  
• provides a range of advice on other aspects, including new European legislation, animal feed ingredients including genetically modified organisms, and labelling and information for purchasers of animal feed |
| Spongiform Encephalopathy Advisory Committee (SEAC)                  | • provides advice and risk assessments on food safety and public and animal health issues relating to TSEs*  
• advises on the change in risk through changing control measures designed to protect human and animal health |
| Scientific Advisory Committee on Nutrition (SACN)                    | • advises on scientific aspects of nutrition and health with specific reference to the nutrient content of individual foods and the diet as a whole  
• advises on wider public health issues where nutritional status is one of the risk factors |
| Advisory Committee on the Microbiological Safety of Foods (ACMSF)    | • provides advice on microbiological issues regarding food  
• advises on the risk to humans of micro-organisms which occur on or in food |
| Advisory Committee on Novel Foods and Processes (ACNFP)              | • advises on matters relating to novel foods and novel processes  
• carries out safety assessments of novel foods or processes submitted for approval under the novel food regulations |

† There will be some changes to the advisory committees which advise the Agency during the next year  
* TSEs are transmissible spongiform encephalopathies such as BSE, CJD and scrapie
Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT)
- assesses the risk to human health from chemicals which may enter the food chain either deliberately or inadvertently. Evaluations may include assessments by the COC and COM
- advises on general principles and new scientific discoveries in relation to chemical toxicity

Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC)
- advises on the potential carcinogenicity of chemicals in food, including possible chemical causes of cancer in humans. COC opinions frequently include advice from the COM
- advises on carcinogenic risks from new scientific discoveries and general science issues

Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment (COM)
- assesses the potential mutagenic risks to man of substances used or proposed for use in foods
- advises on general principles or new scientific discoveries in connection with mutagenic risks, and on testing methods and strategies for assessing mutagenicity

The Agency seeks a formal opinion from a committee for a number of reasons, including:
- that the advice is fundamental to a policy decision to be taken by the Board
- information suggests that there might be a risk but this information has not been peer-reviewed
- a view on the balance of evidence is needed
- areas of developing science, where the level of uncertainty is significant and are being considered
- horizon scanning
- setting research and development priorities, and
- science governance

Committees which advise the Agency on pesticides and veterinary medicines
Advisory Committees on Pesticides [www.pesticides.gov.uk/acp_home.asp](http://www.pesticides.gov.uk/acp_home.asp)
Pesticide Residues Committee [www.pesticides.gov.uk/prc_home.asp](http://www.pesticides.gov.uk/prc_home.asp)
Veterinary Products Committee [www.vpc.gov.uk](http://www.vpc.gov.uk)
Veterinary Residues Committee [www.vet-residues-committee.gov.uk](http://www.vet-residues-committee.gov.uk)