ZOONOSES MONITORING

UNITED KINGDOM

The Report referred to in Article 9 of Directive 2003/99/EC

TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN HUMANS, FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks and antimicrobial resistance in zoonotic agents

IN 2005

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **United Kingdom**

Reporting Year: **2005**

Institutions and laboratories involved in reporting and monitoring:

Laboratory name	Description	Contribution
Department for Environment, Food and Rural Affairs (Defra)	Competent Authority for Directive 2003/99	Co-ordination of report production
Department of Agriculture and Rural Development, (DARD) Northern Ireland	Competent Authority in Northern Ireland for Directive 2003/99	Co-ordination of information on zoonotic agents in animals, and feed.
Health Protection Agency	The Health Protection Agency (HPA) is an independent body that protecte the health and well-being of everyone in England and Wales	Data on Zoonoses and zoonotic agents in humans, foodborne outbreaks, and antimicrobial resistance in humans and food isolates.
National Public Service for Wales, Communicable Disease Surveillance Centre (Zoonoses Surveillance Unit)	The epidemiological investigation arm of the National Public Health Service for Wales. It protects the population from infection by surveillance and independent advice, outbreak investigation and applied research	Data on zoonotic agents in humans in England and Wales.
Veterinary Laboratories Agency (VLA)	VLA is an Executive Agency of Defra. It has a regional network of veterinary laboratories and provides animal disease surveillance, diagnostic services and research	Data on zoonotic agents in animals and feed, collation of data from Scottish Agricultural College, antimicrobial resistance data on isolates from animals in GB
Department of Health (DH)	Government department . The aim of DH is to improve the health and well being of people in England.	Overview

Scottish Agriculture college	Under contract provides surveillance information on range of animal diseases to the Scottish Executive Environment and Rural Affairs Department	Data on zoonotic agents in animals in Scotland
Scottish Executive Environment and Rural Affairs Department	Devolved Administration for Scotland	Overview
Food Standards Agency (FSA)	The Food Standards Agency is an independent government department set up by an Act of Parliament in 2000 to protect the public's health an consumer interests in relation to food.	Data on zoonotic agents in food in UK
Health Protection Scotland (HPS)	Health Protection Scotland established to by Scottish Executive to strengthen and co-ordinate health protection in Scotland. HPS was formed on 11 November 2004	Data on Zoonoses and zoonotic agents in humans, foodborne outbreaks, in Scotland.
Health Protection Agency, Communicable Disease Surveillance Centre, Northern Ireland	Surveillance of communicable disease. Advice an support to public health authorities and health professionals, training, and research in Northern Ireland	Data on zoonotic agents in humans in Northern Ireland and foodborne outbreaks
Welsh Assembly Government, Dept fro Environment Planning and Countryside	Devolved Administration for Wales	Overview

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/EC[1]. The information has also been forwarded to the European Food Safety Authority (EFSA).

The report contains information on trends and sources of zoonoses and zoonotic agents in United Kingdom during the year 2005. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.

The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.

The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the Community Legislation, while for the other zoonoses national approaches are applied.

The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.

The information covered by this report is used in the annual Community Summary Report on zoonoses that is published each year by EFSA.

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[1] Directive 2003/99/EC of the European Parliament and of the Council of 12 December 2003 on the monitoring of zoonoses and zoonotic agents, amending Decision 90/424/EEC and repealing Council Directive 92/117/EEC, OJ L 325, 17.11.2003, p. 31

LIST OF CONTENTS

1. ANIMAL POPULATIONS

The relevance of the findings on zoonoses and zoonotic agents has to be related to the size and nature of the animal population in the country.

A. Information on susceptible animal population

Sources of information:

Official National Statistics

Dates the figures relate to and the content of the figures:

The figures given relate to census data, mainly in June 2005, unless where stated in the table.

Definitions used for different types of animals, herds, flocks and holdings as well as the types covered by the information:

The information collected on national statistics analysis does not always correspond to the information breakdown in the table and where this has occured it is noted. It is not possible in many cases to give the number of herds or flocks per holding.

National evaluation of the numbers of susceptible population and trends in these figures:

The number of dairy cows was 3% lower than in 2004, whilst the beef herd rose by 2% compared with 2004. Total pigs decreased by 6% in 2005 compared with 2004. Total sheep and lambs stayed relatively stable with a decrease of 1%. The layer flock numbers were similar to 2004. There was a decrease in broilers, and turkeys in 2005 compared with 2004.

Geographical distribution and size distribution of the herds, flocks and holdings

Cattle
The June 2002 census indicated that for cattle and calves 53% of the number were located in England, 11% in Wales, 19% in Scotland and 16% in Northern Ireland. In UK almost 44% were in holdings of 200 head or more.
Sheep
In June cnsus 2003 43% of the number of sheep were in England, 28% in Wales, 22% in Scotland, 6% in Northern Ireland. Over 53% were on holding with 1000 or more head.
Pigs
In June 2002 census 83% of the total number of pigs was located in England, 0.01% in Wales, 9% in Scotland and 7% in Northern Ireland. Over 80% of the total number of pigs were on holdings with 1000 head or more.

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of holdings	Year*	Livestock numbers (live animals)	Year*	Number of slaughtered animals	Year*
Cattle (bovine animals)	dairy cows and heifers (1)					2065000	2005		
	meat production animals (2)					1768000	2005		
	calves (under 1 year)					2732000	2005		
	in total					10414000	2005		
Deer	farmed - in total					33000	2005		
Ducks	in total (3)					2392523	2003		
Gallus gallus (fowl)	breeding flocks, unspecified - in total					8562000	2005		
	breeding flocks for egg production line - in total					2689000	2005		
	breeding flocks for meat production line - in total (4)					3829000	2005		
	laying hens					29550000	2005		
	broilers					111487000	2005		
	in total					160528000	2005		
Geese	in total					1577690	2003		
Goats	in total					96000	2005		
Pigs	breeding animals					554000	2005		
	in total			10375	2002	4864000	2005		
Sheep	in total			88775	2002	35517000	2005		
Solipeds, domestic	horses - in total (5)					299886	2003		
Turkeys	in total (6)					6935000	2005		

(1): Dairy cows and heifers that have calved.
(2): Beef cows and heifers that have calved.
(3): not including Wales
(4): GB
(5): Only includes horses on agricultural land. Approximately 1 million horses in total.
(6): Scotland not included.

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

Zoonoses are diseases or infections, which are naturally transmissible directly or indirectly between animals and humans. Foodstuffs serve often as vehicles of zoonotic infections. Zoonotic agents cover viruses, bacteria, fungi, parasites or other biological entities that are likely to cause zoonoses.

2.1. SALMONELLOSIS

2.1.1. General evaluation of the national situation

A. General evaluation

History of the disease and/or infection in the country

Salmonellas have been recognised as important pathogens and Salmonella Enteritidis and Salmonella Typhimurium have accounted for the majority of cases of human salmonellosis for many years and have consistently been the most commonly implicated pathogens in general outbreaks of foodborne disease.

National evaluation of the recent situation, the trends and sources of infection

There was a continued reduction in the number of cases of salmonellosis reported in humans in the UK as a whole (12831
cases in 2005), and S. Enteritidis and S. Typhimurium remain the two most common serotypes. .
In animals there was a reduction in the number of reported incidents of Salmonella in cattle and sheep, with an increase in reported incidents in pigs and in poultry in general. In Gallus gallus breeding flocks where a control plan is in operation in line with Directive 92/117 there was one confirmed cases of S. Enteritidis. In chickens the most common serotype reported in 2005 was S. Livingstone.
In cattle the most frequently isolated serotypes were S. Dublin and S. Typhimurium.
As in previous years, the most common serovar in sheep was S. enterica subspecies diarizonae serovar 61:k:1,5,7 which made up over 64% of total reports.
In pigs in 2005 the most commonly isolated serovars were S. Typhimurium and S. Derby which comprised 70% and 12% of total, mainly clinical, reports respectively.
The most commonly isolated serovar from ducks was S. Indiana (27% of total reports).
The two most commonly isolated serovars in turkeys were S. Derby (20% of total reports), S. Kottbus 15%, S. Newport 12% and S. Typhimurium 8% of total reports.
Food
LACORS/HPA Coordinated Local Authority Sentinel Surveillance of Pathogens (CLASSP)
A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.
FSA/LA Wales and Northern Ireland Poultry surveillance
A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Salmonella contamination in whole chickens available to the consumer in Wales and Northern Ireland. 35 samples out of a total of 877 chickens sampled tested positive for Salmonella. Samples were examined for the presence or absence of Salmonella spp. in accordance with BS EN 1SO 6579:2002 Microbiology of food and animal feeding stuffs - Horizontal method for the detection of Salmonella spp.
In a further study 914 chickens were sampled and 50 were positive for Salmonella.
Antimicrobial resistance - see additional information.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Comparison of the salmonella serotypes found in animals, feedingstuffs, food and man helps to sugget possible sources of infection in the food chain.

Antimicrobial resistance

The antimicrobial sensitivity of salmonella isolates from cattle, sheep, pigs, turkeys and chickens, in addition to a number of other species, was determined. No resistance to cefotaxime, ceftazidime or amikacin was detected in Salmonella isolates from any species; this is an important finding since third generation cephalosporins and some aminoglycosides are important antimicrobials in the treatment of salmonellosis in humans. Two isolates of Salmonella Typhimurium phage type U288 were made from pigs from the same farm that were resistant to ciprofloxacin in the disc diffusion test. The ciprofloxacin MIC of these isolates is being determined.

Additional information

Food

The UK government undertakes national microbiological food surveillance. The priorities of these surveys are closely linked to a strategy to reduce the level of foodborne disease. Surveys are carried out regularly on a variety of foods and processes to gather data on the possible effects of processing changes on pathogens and to monitor high-risk foods linked to human cases/outbreaks and the emergence of new pathogens. In addition to national surveillance Wales, Scotland and Northern Ireland also have separate microbiological food surveillance programmes within their own regions.

The UK government also collates returns from all UK food authorities on official food enforcement activities in line with Regulation (EC) No 882/20041 on official controls performed to ensure the verification of compliance with feed and food law, and animal health and animal welfare rules. The results of this food testing, which is done locally, are returned to the European Commission annually as required by the Regulation and therefore have not been included in this report.

Antimicrobial sensitivity

The surveillance programme for antimicrobial resistance in farm animals in England and Wales can be divided into three broad areas, providing different and complementary information. The first of these is the surveillance programme for antimicrobial resistance in bacteria recovered from animals after slaughter for human consumption, which in fact covers the whole of Great Britain. The Veterinary Laboratories Agency (VLA) Salmonella surveillance programme is the second and covers England and Wales, capturing data from incidents reported under statute (the Zoonoses Order 1989). All Salmonella isolates from new incidents of infection with this organism in farm animals are examined. The third comprises a national antimicrobial sensitivity database introduced to the network of 14 VLA regional laboratories throughout England and Wales in 1998 and which collects data from all of the sensitivity tests that are performed on clinical samples. These three data sets therefore complement each other, with the data from the diagnostic laboratories providing information on farms where clinical disease outbreaks are occurring (targeted surveillance) and the data gathered under the abattoir surveys providing information at the point at which animals (from a number of farms) enter the food chain. Statistically robust sampling schemes are important for the monitoring of abattoirs or sentinel farms. A national abattoir surveillance study of this type was not performed in 2005; the last

such survey was performed in 2003. There is also a need to ensure that an alert system is in place to rapidly identify emergent resistance at the earliest opportunity. This is best achieved both by surveillance of herds with clinical disease problems, where the organisms are likely to be under greatest selective pressure having been subjected to treatment and by the surveillance of livestock at the point of slaughter.

The results given for E. coli relate to E. coli isolates from all sources and for cattle this includes isolates from milk as well as from faeces and other sites. No resistance was detected to ceftiofur in isolates from pigs, chickens or turkeys. Resistance to enrofloxacin was only detected in E. coli isolates from pigs; no resistance was detected to enrofloxacin in E. coli isolates from cattle, chickens, turkeys or sheep.

2.1.2. Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Results of the investigation

No results to report in 2005.

B. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At retail

A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. One part covers the surveillance of these pathogens in raw whole chicken on retail sale in England and Scotland. In total 50 (5.5%) samples out of a total of 914 chickens sampled tested positive for Salmonella.
A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Salmonella contamination in whole chickens available to the consumer in Wales and Northern Ireland.
In total, 35 (4.0%) samples out of a total of 877 chickens sampled tested positive for Salmonella.

Frequency of the sampling

At retail

Other: 12-month period (January-December 2005

Type of specimen taken

At retail

Other: whole fresh chicken

Diagnostic/analytical methods used

At retail

Other: HPA Standard Microbiological Food Method for detection of Salmonella spp. which is based on the British Standard method BS EN 12824: 1998 Microbiological examination of food and animal feeding stuffs Horizontal method for the detection of Salmonella spp.

Results of the investigation

In total 50 (5.5%) samples out of a total of 914 chickens sampled tested positive for Salmonella in England and Scotland survey, and in Wales and Northern Ireland, in total, 35 (4.0%) samples out of a total of 877 chickens sampled tested positive for Salmonella. No S. Enteritidis was isolated in either survey, and two S. Typhimurium were isolated, one from each survey.
Samples were examined for the presence or absence of Salmonella spp. in accordance with the HPA Standard Microbiological Food Method for detection of Salmonella spp. which is based on the British Standard method BS EN 12824: 1998 Microbiological examination of food and animal feeding stuffs: Horizontal method for the detection of Salmonella spp.

C. Salmonella spp. in turkey meat and products thereof

Results of the investigation

No results to report in 2005.

D. Salmonella spp. in pig meat and products thereof

Results of the investigation

No results to report in 2005.

E. Salmonella spp. in bovine meat and products thereof

Results of the investigation

No results to report in 2005.

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Meat from broilers (Gallus gallus)								
fresh (1)	Survey	Single chicken		914	50	0	1	49
- at retail - Monitoring (Wales and Northern Ireland whole carcass fresh) (2)	Survey	Single chicken		877	35	0	1	34

(1) : A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale
(2) : A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005)

Footnote

Sample weight. The sample is obtained by removing neck skin (the quantity and weight can vary depending on how much neck skin is present on the chicken). The whole chiken is rinsed in 225ml BPW. The neck skin is placed in the rinse bag and total contents submitted for laboratroy analysis.

2.1.3. Salmonella in animals

A. Salmonella spp. in Gallus gallus - breeding flocks for egg production and flocks of laying hens

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

In Great Britain (England, Wales, Scotland) Directive 92/117 is implemented by the Zoonoses Order, 1989, and by the Poultry Breeding Flocks and Hatcheries Order, 1993.
Directive 92/117/EEC is implemented in Northern Ireland through the Poultry Breeding Flocks and Hatcheries Scheme Order (Northern Ireland) 1994 and the Zoonoses Order (Northern Ireland) 1991.

Laying hens flocks

In layer flocks all isolations of salmoenella must be reported to the Competent authority (under the Zoonoses Order 1989 in Great Britain, and in Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991].
In Great Britain holdings of layer flocks where S. Enteritidis and S. Typhimurium have been isolated are given advice on salmonella control and a visit to carry out an epidemiological enquiry as appropriate.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Sampled at the hatchery by the operator each elite grandparent supply flock once per week, and official samples each 4 weeks. For parents supply flocks the sampling is each 2 weeks and each 8 weeks respectively.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Sampled by operator at 4 weeks and 2 weeks before prodcution. Samples to official laboratory.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Grandparents sampled weekly at hatchery by operator, officially each 4 weeks. Parent flocks sampled every 2 weeks by operator, every 8 weeks officially at hatchery.

Laying hens: Day-old chicks

Other: Day olds are sampled from each source flock every 2 weeks by operator at hatchery, and officially every 8 weeks at hatchery as the monitoring procedure for layer breeder parent flocks

Laying hens: Rearing period

Other: No official sampling.

Laying hens: Production period

Other: No official sampling.

Laying hens: Before slaughter at farm

Other: No official sampling

Laying hens: At slaughter

Other: No official sampling

Eggs at packing centre (flock based approach)

Other: No official sampling

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Official samples are as in Directive 92/117. Private samples may be fluff, dust etc.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Official sample taken by operator is faeces. Private samples may be boot swabs, dust also.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Official samples as per Directive 92/117 - cull chicks, meconium taken at hatchery

Laying hens: Day-old chicks

Other: Cull chicks, meconium, private samples may be fluff, environmental samples and others, used as monitoring of parent layer breeder.

Laying hens: Production period

Other: No official sampling

Laying hens: Before slaughter at farm

Other: No official sampling

Laying hens: At slaughter

Other: No official sampling.

Eggs at packing centre (flock based approach)

Other: No official sampling.

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Samples taken by operators according to Directive 92/117 sent to authorised laboratory for examination. Official samples taken sent or delivered same day to National Reference Laboratory (Regional Laboratory) for culture. Isolates sent to NRL for serotyping and phage typing as priority if a Group B or Group D has been cultured.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Samples taken by operators according to Directive 92/117 sent to authorised laboratory for examination. Official samples taken sent or delivered same day to National Reference Laboratory (Regional Laboratory) for culture. Isolates sent to NRL for serotyping and phage typing as priority if a Group B or Group D has been cultured.

Breeding flocks: Production period

Samples taken by operators according to Directive 92/117 sent to authorised laboratory for examination. Official samples taken sent or delivered same day to National Reference Laboratory (Regional Laboratory) for culture. Isolates sent to NRL for serotyping and phage typing as priority if a Group B or Group D has been cultured.

Laying hens: Day-old chicks

No official sampling

Laying hens: Rearing period

No official sampling

Laying hens: Production period

No official sampling

Laying hens: Before slaughter at farm

No official sampling

Laying hens: At slaughter

No official sampling

Eggs at packing centre (flock based approach)

No official sampling

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. In addition to investigation of the day old breeder chicks, the source flock/s of the hatching eggs will be investigated. If the report is one of a number of isolates made at the same time from a hatchery, serological monitoring may be carried out if the birds in the source flocks have not been vaccinated. No further action will be taken if the flock proves to be serologically negative. If the flock proves to be serologically positive, if the birds have been vaccinated or it is the only isolate, the flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directvie 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. The flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directive 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. The flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directvie 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Laying hens: Day-old chicks

Isolation of a Salmonella from the layer flock will be recorded as positive. Trace back to the breeding flock which produced the day old layer chick will be conducted and the source breeding flock investigated as above.

Laying hens: Rearing period

No official testing is carried out. A report of salmonella under the legislation is classed as positive on the monitoring database; no confirmatory testing is carried out.

Laying hens: Production period

No official testing is carried out. A report of salmonella under the legislation is classed as positive on the monitoring database; no confirmatory testing is carried out.

Laying hens: Before slaughter at farm

No official testing is carried out. A report of salmonella under the legislation is classed as positive on the monitoring database; no confirmatory testing is carried out.

Laying hens: At slaughter

No official testing is carried out. A report of salmonella under the legislation is classed as positive on the monitoring database; no confirmatory testing is carried out.

Eggs at packing centre (flock based approach)

No official testing is carried out. A report of salmonella under the legislation is classed as positive on the monitoring database; no confirmatory testing is carried out.

Diagnostic/analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Bacteriological method: Modified ISO 6579

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Bacteriological method: Modified ISO 6579

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: Modified ISO 6579

Laying hens: Day-old chicks

Bacteriological method: Modified ISO 6579

Laying hens: Rearing period

Other: Varius bacteriological

Laying hens: Production period

Bacteriological method: Various bacteriological

Laying hens: Before slaughter at farm

Bacteriological method: Various bacteriological

Laying hens: At slaughter

Bacteriological method: Various bacteriological

Eggs at packing centre (flock based approach)

Other: Various

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

There are no restrictions on the use of salmonella vaccines which have a marketing authorisation. Vaccine is less used in the layer breeder sector than in the broiler breeder sector.

Laying hens flocks

There are no restrictions on the use of salmonella vaccines which have a marketing authorisation. A large proportion of the commercial layer flocks are vaccinated with a salmonella vaccine.

Other preventive measures than vaccination in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Codes of good practice in the control of salmonella on layer farms and in the production, handling and transport of feed, as well as advice on rodent control have been published in collaboration with the industry.

Laying hens flocks

Advice as per breeding flocks.

Control program/mechanisms

The control program/strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Any breeding flock found to be infected with S. Typhimurium or S. Enteritidis according to the protocol outlined above is compulsorily slaughtered with compensation. When Salmonella Enteritidis or Salmonella Typhimurium is suspected in a breeding flock the holding is placed under official control. An investigation is carried out on all the flocks on the site. If the flock is compulsorily slaughtered the holding remains under official control until cleaning and disinfection has been carried out and shown to be satisfactory by microbiological culture of samples taken from the empty house.

Laying hens flocks

There is no official control plan for salmonella in layer flocks although there is an industry operated scheme which covers most of the egg production. If Salmonella Enteritidis or Salmonella Typhimurium is isolated from a commercial laying flock, the premises is normally visited and advice is given on measures that can be taken to control infection on the premises and to prevent transmission of infection to subsequent flocks.

Measures in case of the positive findings or single cases

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Any breeding flock found to be infected with S. Typhimurium or S. Enteritidis according to the protocol outlined above is compulsorily slaughtered with compensation. When Salmonella Enteritidis or Salmonella Typhimurium is suspected in a breeding flock the holding is placed under official control. An investigation is carried out on all the flocks on the site. If the flock is compulsorily slaughtered the holding remains under official control until cleaning and disinfection has been carried out and shown to be satisfactory by microbiological culture of samples taken from the empty house.

Laying hens flocks

If Salmonella Enteritidis or Salmonella Typhimurium is isolated from a commercial laying flock, the premises is normally visited and advice is given on measures that can be taken to control infection on the premises and to prevent transmission of infection to subsequent flocks.

Notification system in place

The main provisions of the Zoonoses Order 1989 are:
- a requirement to report to a veterinary officer of the Minister the results of tests which identify the presence of a salmonella from an animal or bird, a carcase of an animal or bird, their surroundings or feedstuffs by the laboratory that carries out the test
- a culture must be provided to the official laboratory on request.

- samples (including live birds) may be taken for diagnosis
- movement restrictions and isolation requirements may be imposed
- provision for compulsory slaughter and compensation where salmonella infection is confirmed in a breeding flock of Gallus gallus.
- compulsory cleansing and disinfection of premises and vehicles

The main provisions of the Poultry Breeding Flocks and Hatcheries Order 1993 are:

- registration of breeding flocks and hatcheries on a once and for all basis free of charge
- minimum flock size requiring registration 250 birds
- hatchery with a total incubator capacity of 1000 eggs or more and which is used for hatching eggs must register
- monitoring of flocks and hatcheries using sampling regimes and bacteriological methods of sampling laid down in Directive 92/117/EC
- testing of samples to be carried out at authorised laboratories.

Results of the investigation

In 2005 there were 6 incidents of salmonella in layer breeder flocks. No S. Enteritidis, S. Typhimurium, S. Hadar, S. Infantis, or S. Virchow were isolated from this sector.

In layers there were 42 incidents of S. Enteritidis, and 3 incidents of S. Typhimurium recorded in Great Britain during routine monitoring carried out be the industry and private veterinarians. Advice was given to the operators on control of salmonella and the codes of good practice to help control the introduction of salmonella and its spread.

Survey of salmonella in layer flock holdings in the UK under Decision 2004/665 to establish a baseline - October 2004 to September 2005.

The study was conducted according to the protocol in Decision 2004/665.

The raw data was forwarded to the Commission for analysis by EFSA. An analysis of the UK data was carried out by the NRL. Small differences in the results of the two analysis may be expected due to inclusion or exclusion of certain data, and the methods of data analysis.

In the analysis by the NRL of the 454 holdings that were sampled in the survey, 55 tested positive for Salmonella on one or more samples giving an estimated holding level prevalence of Salmonella on UK layer farms of 11.9% (CI95% 9.5 -14.3%). Within these 55 positive holdings, 18 different serovars were identified. More than one serovar was isolated on seven of the holdings. No holding was found to have both S. Enteritidis and S. Typhimurium together. S. Virchow and S. Infantis were each found on a single holding, while S. Hadar was not found on any holdings. S. Enteritidis was isolated from 28 of the 454 holdings giving a weighted prevalence of 5.8% (CI95% 4.2 - 7.4%). S. Typhimurium was isolated from 8 holdings and the estimated prevalence of this serovar was 1.8% (CI95% 0.8-2.9%).

All isolates of S. Enteritidis, S. Typhimurium, S. Virchow and S. Thompson were phage typed. The two typable isolates of S. Thompson were phage type 2 while the single typable S. Virchow isolate was PT57. The most common S. Enteritidis phage type was PT4, which was isolated from over half of the positive holdings. PT35 and PT6 were also found frequently and were present in more than one quarter of the infected holdings. S. Typhimurium definitive phage type DT104 was identified on four of the eight infected holdings.

National evaluation of the recent situation, the trends and sources of infection

The levels of Salmonella Enteridis and Salmonella Typhimurium in layer breeder flocks remains at very low levels with no confirmed reports in 2005.

In layers the total number of routine reports remains low and this coupled with the voluntary nature of the sampling makes it difficult to establish any trend.
The baseline survey carried out under Decision 2004/665 was the first to this protocol. It is therefore not possible to establish a trend from this one survey.
The majority of egg production in the UK has voluntarily operated to an industry code of practice for a number of years. In addition to a number of measures the code requires vaccination of flocks against Salmonella. The indications are that the level of salmonella on layer farms is declining, if we take into account the number of reported cases of human salmonellosis and the results of previous and recent surveys for the presence of salmonella in UK produced eggs.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Salmonella Enteritidis and Salmonella Typhimurium are the most common isolates found in humans.

B. Salmonella spp. in Gallus gallus - breeding flocks for meat production and broiler flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

In Great Britain (England, Wales, Scotland) Directive 92/117 is implemented by the Zoonoses Order, 1989, and by the Poultry Breeding Flocks and Hatcheries Order, 1993.
Directive 92/117/EEC is implemented in Northern Ireland through the Poultry Breeding Flocks and Hatcheries Scheme Order (Northern Ireland) 1994 and the Zoonoses Order (Northern Ireland) 1991.
In broiler flocks all isolations of salmoenella must be reported to the Competent authority (under the Zoonoses Order 1989 in Great Britain, and in Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]. Under Northern Ireland controls, any broiler flock, where birds infected with Salmonella Typhimurium or Salmonella Enteritidis are located, is restricted and the birds moved to slaughter under licence. The breeder flock that contributed to the hatch will be traced and sampled as necessary.

Broiler flocks

In broiler flocks all isolations of salmonella must be reported to the Competent authority (under the Zoonoses Order 1989 in Great Britain, and in Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]. Under Northern Ireland controls, any broiler flock, where birds infected with

Salmonella Typhimurium or Salmonella Enteritidis are located, is restricted and the birds moved to slaughter under licence. The breeder flock that contributed to the hatch will be traced and sampled as necessary.
In Great Britain holdings of broiler flocks where S. Enteritidis and S. Typhimurium have been isolated are given advice on salmonella control and a visit to carry out an epidemiological enquiry as appropriate.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Sampled at the hatchery by the operator each elite grandparent supply flock once per week, and official samples each 4 weeks. For parents supply flocks the sampling is each 2 weeks and each 8 weeks respectively.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Sampled by operator at 4 weeks and 2 weeks before production. Samples to official laboratory.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Grandparents sampled weekly at hatchery by operator, officially each 4 weeks. Parent flocks sampled every 2 weeks by operator, every 8 weeks officially at hatchery.

Broiler flocks: Day-old chicks

Other: Day olds are sampled from each source flock every 2 weeks by operator at hatchery, and officially every 8 weeks.

Broiler flocks: Rearing period

Other: no official sampling

Broiler flocks: Before slaughter at farm

Other: No official sampling but private samling common 1 - 2 weeks before slaughter

Broiler flocks: At slaughter (flock based approach)

Other: No official sampling, private sampling may take place

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Official samples are as in Directive 92/117. Private samples may be fluff, dust etc.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Official sample is faeces. Private samples may be boot swabs, dust also.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Official samples as per Directive 92/117 - cull chicks, meconium

Broiler flocks: Day-old chicks

Other: cull chicks, meconium, private samples may be fluff, environmental samples and others

Broiler flocks: Rearing period

Other: Private samples, range of types but faeces, boot swabs common

Broiler flocks: Before slaughter at farm

Other: Private samples, boot swabs common.

Broiler flocks: At slaughter (flock based approach)

Other: Private samples, neck skin common

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Samples taken by operators according to Directive 92/117 sent to authorised laboratory for examination. Official samples taken sent or delivered same day to National Reference Laboratory (Regional Laboratory) for culture. Isolates sent to NRL for serotyping and phage typing as priority if a Group B or Group D has been cultured.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

As above

Breeding flocks: Production period

As above

Broiler flocks: Day-old chicks

As above - these are sampled at the hatchery as a check on the source breeding

flock as per Directive 92/117.

Broiler flocks: Rearing period

No official sampling undertaken.

Broiler flocks: Before slaughter at farm

No official sampling undertaken

Broiler flocks: At slaughter (flock based approach)

No official sampling undertaken

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. In addition to investigation of the day old breeder chicks, the source flock/s of the hatching eggs will be investigated. If the report is one of a number of isolates made at the same time from a hatchery, serological monitoring may be carried out if the birds in the source flocks have not been vaccinated. No further action will be taken if the flock proves to be serologically negative. If the flock proves to be serologically positive, if the birds have been vaccinated or it is the only isolate, the flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directvie 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. The flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directvie 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

If Salmonella Enteritidis or Salmonella Typhimurium is reported under the Zoonoses Order 1989 further investigations are instituted. The flock will be investigated by taking a statistical sample of birds and examining organs for salmonellas (as per Directvie 92/117). On post-mortem examination all breeder flocks found to be culturally positive for Salmonella Enteritidis or Salmonella Typhimurium are slaughtered with compensation.

Broiler flocks: Day-old chicks

Isolation of a sample from the broiler flock will be recorded as positive, but no confirmation testing will be carried out as no official action is taken on the broiler flock. Trace back to the breeding flock which produced the day old broiler chick will be conducted and the source breeding flock investigated as above.

Broiler flocks: Rearing period

An isolation reported under the Zoonoses Order is recorded as positive. No confirmation testing is carried out as no official action is taken.

Broiler flocks: Before slaughter at farm

An isolation reported under the Zoonoses Order is recorded as positive. No confirmation testing is carried out as no official action is taken.

Broiler flocks: At slaughter (flock based approach)

An isolation reported under the Zoonoses Order is recorded as positive. No confirmation testing is carried out as no official action is taken.

Diagnostic/analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Bacteriological method: Modified ISO 6579:2002

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Modified ISO 6579:2002

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Modified ISO 6579:2002

Broiler flocks: Day-old chicks

Other: Modified ISO 6579:2002

Broiler flocks: Rearing period

Bacteriological method: Various methods may be used

Broiler flocks: Before slaughter at farm

Bacteriological method: Various methods may be used

Broiler flocks: At slaughter (flock based approach)

Bacteriological method: Various methods may be used

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation. In practice they tend to be used at the parent level.

Broiler flocks

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation. It is believed that vaccination of broiler flocks is rare.

Other preventive measures than vaccination in place

Broiler flocks

Codes of good practice in the contol of salmonella on broiler farms and in the production, handling and transport of feed, as well as advice on rodent control have been published in collaboration with the industry.

Control program/mechanisms

The control program/strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Any breeding flock found to be infected with S. Typhimurium or S. Enteritidis according to the protocol outlined above is compulsorily slaughtered with compensation. When Salmonella Enteritidis or Salmonella Typhimurium is suspected in a breeding flock the holding is placed under official control. An investigation is carried out on all the flocks on the site. If the flock is compulsorily slaughtered the holding remains under official control until cleaning and disinfection has been carried out and shown to be satisfactory by microbiological culture of samples taken from the empty house.

Broiler flocks

There is no official control plan for salmonella in broiler flocks. If Salmonella Enteritidis or Salmonella Typhimurium is isolated from a commercial laying flock, the premises is normally visited and advice is given on measures that can be taken to control infection on the premises and to prevent transmission of infection to subsequent flocks. When broiler flocks are found to be infected advice on the control of infection is given to the company involved and a proportion of premises which have had positive birds is visited.

Measures in case of the positive findings or single cases

Breeding flocks (separate elite, grand parent and parent flocks when

necessary): Day-old chicks

As outlined in the control plan above.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

As in control plan

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

As in control plan

Broiler flocks: Day-old chicks

The suspicion of Salmonella Enteritidis or Salmonella Typhimurium in day old broiler chicks would lead to an investigation of the supply flock(s) as described above.

Broiler flocks: Rearing period

There is no official control plan for salmonella in broiler flocks. If Salmonella Enteritidis or Salmonella Typhimurium is isolated from a commercial laying flock, the premises is normally visited and advice is given on measures that can be taken to control infection on the premises and to prevent transmission of infection to subsequent flocks. When broiler flocks are found to be infected advice on the control of infection is given to the company involved and a proportion of premises which have had positive birds is visited.

Notification system in place

The main provisions of the Zoonoses Order 1989 are:
- a requirement to report to a veterinary officer of the Minister the results of tests which identify the presence of a salmonella from an animal or bird, a carcase of an animal or bird, their surroundings or feedstuffs by the laboratory that carries out the test
- a culture must be provided to the official laboratory on request.
- samples (including live birds) may be taken for diagnosis
- movement restrictions and isolation requirements may be imposed
- provision for compulsory slaughter and compensation where salmonella infection is confirmed in a breeding flock of Gallus gallus.
- compulsory cleansing and disinfection of premises and vehicles

The main provisions of the Poultry Breeding Flocks and Hatcheries Order 1993 are:
- registration of breeding flocks and hatcheries on a once and for all basis free of charge
- minimum flock size requiring registration 250 birds
- hatchery with a total incubator capacity of 1000 eggs or more and which is used for hatching eggs must register
- monitoring of flocks and hatcheries using sampling regimes and bacteriological methods of sampling laid down in Directive 92/117/EC
- testing of samples to be carried out at authorised laboratories.

Results of the investigation

In Elite and Grandparent flocks for meat production no salmonella were isolated. In parent broiler breeder flocks Salmonella Enteritidis was confirmed in one flock which was slaughtered. No Salmonella Typhimurium was confirmed.
Both monitoring on farm and at the hatchery takes place by the operator in addition to the official samples taken by the competent authority. Reports from hatchery environment monitoring include isolates which could not be linked to a specific breeding flock; some of these isolates may be from the same flock or residual infection in the hatchery environment, and may be reported more than once with repeated sampling. The most common serovars reported and associated with the meat production breeder sector were S. Livingstone and S. Senftenberg. S. Virchow was reported on 5 occasions. There were no reports of S. Infantis or S. Hadar.
Reports of salmonella in broilers is normally from samples taken by the industry before slaughter when the birds are 3 to 4 weeks old. Three reports of S. Enteritidis and 6 reports of S. Typhimurium were recorded. The most common serovars recorded on broiler farms were S. Livingstone, S. Senftenberg and S. Kedougou.

National evaluation of the recent situation, the trends and sources of infection

The prevalence of S. Enteritidis and S. Typhimurium in breeding flocks in meat production remains at very low levels with only one confirmed case in 2005 in a parent breeder.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

The common serotypes found associated with broilers are not commonly reported in cases of human salmonellosis.

C. Salmonella spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]

Meat production flocks

As for breeding birds all salmonella isolates must be reported.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Voluntary

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Voluntary

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Voluntary

Meat production flocks: Day-old chicks

Other: Voluntary

Meat production flocks: Rearing period

Other: Voluntary

Meat production flocks: Before slaughter at farm

Other: Voluntary

Meat production flocks: At slaughter (flock based approach)

Other: Voluntary

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Voluntary

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: Voluntary

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Voluntary

Meat production flocks: Day-old chicks

Other: Voluntary

Meat production flocks: Rearing period

Other: Voluntary

Meat production flocks: Before slaughter at farm

Other: Voluntary

Meat production flocks: At slaughter (flock based approach)

Other: Voluntary

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

No official sampling undertaken. Voluntary sampling.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

No official sampling undertaken. Voluntary sampling.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Day-old chicks

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Rearing period

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Before slaughter at farm

No official sampling undertaken. Voluntary sampling.

Meat production flocks: At slaughter (flock based approach)

No official sampling undertaken. Voluntary sampling.

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Day-old chicks

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Rearing period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Before slaughter at farm

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: At slaughter (flock based approach)

Reports of salmonella isolate under the relevant legislation are classed as positive.

Diagnostic/analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Bacteriological method: Various may be used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: Various may be used

Meat production flocks: Day-old chicks

Bacteriological method: Various may be used

Meat production flocks: Rearing period

Bacteriological method: Various may be used

Meat production flocks: Before slaughter at farm

Bacteriological method: Various may be used

Meat production flocks: At slaughter (flock based approach)

Bacteriological method: Various may be used

Case definition

An incident comprises the first isolation and all subsequent isolations of the same serotype or serotype and phage/definitive type combination of a particular salmonella from an animal, group of animals or their environment on a single premises.

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Meat production flocks

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Control program/mechanisms

The control program/strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Breeding flocks are encouraged to monitor in the same way as Gallus gallus under Directive 92/117, but there is no official salmonella control programme for turkeys.

Meat production flocks

Producers are encouraged to monitor, but there is no official sampling.

Measures in case of the positive findings or single cases

Public health authorities are advised of the isolation of salmonellas, and the owner is given advice and visits will be made to the farm if the salmonella is of public health significance.

Notification system in place

All isolations of salmonella must be reported under the Zoonoses Order 1989 and related legislation in Great Britain and in Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]

Results of the investigation

There were 279 reported incidents in 2005, an increase on the 243 cases in 2004. All laboratories report the isolation of salmonella but the number of samples examined which are negative is not known.. Most of the samples in turkeys are taken for monitoring purposes but diagnostic samples are also included. The two most commonly isolated serovars were S. Derby and S. Kottbus (20% and 15% of total reports). There was a reduction in the number of reports of S. Typhimurium with 24 reports in 2005 compared with 37 incidents in 2004. The phage types reported were mainly DT104 (20 incidents). There were two reports of Salmonella Rissen during 2005, similar to 2004 when it had been first recorded in turkeys. There was a similar number of S. Newport reports, none of which showed the typical MDR resistance pattern of USA strains.

National evaluation of the recent situation, the trends and sources of infection

The voluntary nature of sampling and the relatively low numbers involved make it difficult to detect trends. Laboratories are required to report all isolations of salmonella but the number of samples examined with negative results is not known. The results do indicate those serovars which are likely to be the most common in turkeys.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Apart from S. Typhimurium the other most common serotypes reported are not commonly found in human isolates.

D. Salmonella spp. in geese - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks

The monitoring system is the same as for other species which are not breeding flocks of Gallus gallus. There is no official control plan for the control of salmonella in any of geese sectors.

Diagnostic/analytical methods used

Breeding flocks: Day-old chicks

Bacteriological method: Various

Breeding flocks: Rearing period

Bacteriological method: Various

Breeding flocks: Production period

Bacteriological method: Various

Meat production flocks: Day-old chicks

Bacteriological method: Various

Meat production flocks: Rearing period

Bacteriological method: Various

Meat production flocks: Before slaughter at farm

Bacteriological method: Various

Meat production flocks: At slaughter (flock based approach)

Bacteriological method: Various

Notification system in place

All salmonellas isolated from geese must be reported to the Competent Authority.

Results of the investigation

Submission of samples from geese is most likely to be for diagnostic purposes. There were no incidents reported in 2005.

E. Salmonella spp. in ducks - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]

Meat production flocks

As for breeding birds all salmonella isolates must be reported.

Frequency of the sampling

Breeding flocks: Day-old chicks

Other: No official sampling undertaken. Voluntary sampling.

Breeding flocks: Rearing period

Other: No official sampling undertaken. Voluntary sampling.

Breeding flocks: Production period

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Day-old chicks

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Rearing period

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Before slaughter at farm

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: At slaughter (flock based approach)

Other: No official sampling undertaken. Voluntary sampling.

Type of specimen taken

Breeding flocks: Day-old chicks

Other: No official sampling undertaken. Voluntary sampling.

Breeding flocks: Rearing period

Other: No official sampling undertaken. Voluntary sampling.

Breeding flocks: Production period

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Day-old chicks

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Rearing period

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: Before slaughter at farm

Other: No official sampling undertaken. Voluntary sampling.

Meat production flocks: At slaughter (flock based approach)

Other: No official sampling undertaken. Voluntary sampling.

Methods of sampling (description of sampling techniques)

Breeding flocks: Day-old chicks

No official sampling undertaken. Voluntary sampling.

Breeding flocks: Rearing period

No official sampling undertaken. Voluntary sampling.

Breeding flocks: Production period

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Day-old chicks

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Rearing period

No official sampling undertaken. Voluntary sampling.

Meat production flocks: Before slaughter at farm

No official sampling undertaken. Voluntary sampling.

Meat production flocks: At slaughter (flock based approach)

No official sampling undertaken. Voluntary sampling.

Case definition

Breeding flocks: Day-old chicks

An incident comprises the first isolation and all subsequent isolations of the same serotype or serotype and phage/definitive type combination of a particular salmonella from an animal, group of animals or their environment on a single premises.

Breeding flocks: Rearing period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Breeding flocks: Production period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Day-old chicks

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Rearing period

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: Before slaughter at farm

Reports of salmonella isolate under the relevant legislation are classed as positive.

Meat production flocks: At slaughter (flock based approach)

Reports of salmonella isolate under the relevant legislation are classed as positive.

Diagnostic/analytical methods used

Breeding flocks: Day-old chicks

Bacteriological method: Various methods may be used

Breeding flocks: Rearing period

Bacteriological method: Various methods may be used

Breeding flocks: Production period

Bacteriological method: Various methods may be used

Meat production flocks: Day-old chicks

Bacteriological method: Various methods may be used

Meat production flocks: Rearing period

Bacteriological method: Various methods may be used

Meat production flocks: Before slaughter at farm

Bacteriological method: Various methods may be used

Meat production flocks: At slaughter (flock based approach)

Bacteriological method: Various methods may be used

Vaccination policy

Breeding flocks

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Meat production flocks

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Other preventive measures than vaccination in place

Breeding flocks

Breeding flocks are encouraged to monitor in the same way as Gallus gallus under Directive 92/117, but there is no official salmonella control programme for turkeys.

Meat production flocks

Producers are encouraged to monitor, but there is no official sampling.

Measures in case of the positive findings or single cases

Public health authorities are advised of the isolation of salmonellas, and the owner is given advice and visits will be made to the farm if the salmonella is of public health significance.

Notification system in place

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]

Results of the investigation

There was an increase in the number of reports from ducks in 2005 with 631 reports compared with 496 in 2004. Although the number of samples examined which were negative is not known, the increase in reports is believed to be the continued enhanced monitoring in this sector. The most commonly isolated serovar from ducks in 2005 S. Indiana (171 reports 27% of total) was the same as in 2004. There were 71 reports of S. Typhimurium in ducks in 2005 and 63 reports of S. Enteritidis. The phage types reported for S. Typhimurium ere mainly DT8, and for S. Enteritidis PT6A.

National evaluation of the recent situation, the trends and sources of infection

The nature of the voluntary sampling makes it difficult to establish trends, but the serovars most common in 2004 remained most commonly reported in 2005.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Salmonella Indiana is reported rarely in humans.

F. Salmonella spp. in pigs

Monitoring system

Sampling strategy

Breeding herds

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]
Almost 90% of incidents are from the isolation of salmonella in samples taken for diagnostic purposes (clinical samples).
There is no routine official sampling.

Multiplying herds

As for breeding herds

Fattening herds

As for breeding herds

Frequency of the sampling

Breeding herds

Other: Voluntary sampling.

Multiplying herds

Other: Voluntary sampling.

Fattening herds at farm

Other: Voluntary sampling.

Fattening herds at slaughterhouse (herd based approach)

Other: Voluntary sampling.

Type of specimen taken

Breeding herds

Other: Voluntary sampling.

Multiplying herds

Other: Voluntary sampling.

Fattening herds at farm

Other: Voluntary sampling.

Fattening herds at slaughterhouse (herd based approach)

Other: Voluntary sampling.

Methods of sampling (description of sampling techniques)

Breeding herds

Voluntary sampling.

Multiplying herds

Voluntary sampling.

Fattening herds at farm

Voluntary sampling.

Fattening herds at slaughterhouse (herd based approach)

Voluntary sampling.

Case definition

Breeding herds

An incident comprises the first isolation and all subsequent isolations of the same serotype or serotype and phage/definitive type combination of a particular salmonella from an animal, group of animals or their environment on a single holding.

Multiplying herds

An incident comprises the first isolation and all subsequent isolations of the same serotype or serotype and phage/definitive type combination of a particular salmonella from an animal, group of animals or their environment on a single holding.

Fattening herds at farm

As above

Fattening herds at slaughterhouse (herd based approach)

As above.

Diagnostic/analytical methods used

Breeding herds

Other: various

Multiplying herds

Other: various

Fattening herds at farm

Other: various

Fattening herds at slaughterhouse (herd based approach)

Serological method: meat juice ELISA

Vaccination policy

Breeding herds

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Multiplying herds

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Fattening herds

There are no restrictions on the use of salmonella vaccines which have a Marketing Authorisation.

Other preventive measures than vaccination in place

Breeding herds

Codes of good practice in the control of salmonella on pig farms and in the production, handling and transport of feed, as well as advice on rodent control have been published in collaboration with the industry.

Multiplying herds

As above

Fattening herds

As above

Control program/mechanisms

Recent actions taken to control the zoonoses

In Great Britain the Meat and Livestock Commission with the British Pig Executive has been developing a Zoonoses Action Plan for the monitoring of salmonella in pigs. This is based on a meat-juice ELISA test at slaughterhouse and classing the farms into differnt levels for subsequent investigation of advisory visits. Northern Ireland has a similar programme operating in all slaughter plants. Funding of the montoring is initially through the industry with government support.

Measures in case of the positive findings or single cases

Public health authorities are advised of the isolation of salmonellas, and the owner is given advice and visits will be made to the farm if the salmonella is of public health significance.

Notification system in place

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]

Results of the investigation

Reports of Salmonella in pigs during 2005 at 194 increased compared with the 164 reports in 2004. The most commonly isolated serovars were S. Typhimurium and S. Derby which comprised 70% and 12% of total reports respectively. The most commonly reported phage types of S. Typhimurium during 2005 were U288 (around 50%, and DT193 (27% of STM in pigs).

National evaluation of the recent situation, the trends and sources of infection

The serovars seen in pigs remain similar to previous years, with S. Typhimurium being the one most commonly isolated. The samples submitted are usually for diagnostic purposes.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Salmonella Typhimurium is the second most common serotype isolated from humans in the UK. Salmonella Derby is not common in isolates of salmonella from humans.

Additional information

Codes of good practice for the prevention and control of salmonella in pig herds on farm have

been published and widely circulated to pig producers in the UK.

G. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

England, Wales, Scotland
Salmonella isolated in a laboratory from cattle must be reported to the competent authority and the isolate provided on request (Zoonoses Order 1981). Over 90% of the isolates from cattle are from samples taken for diagnostic purposes.

Frequency of the sampling

Animals at farm

Other: Over 90% voluntary samples taken by veterianarian for diagnostic purposes

Type of specimen taken

Animals at farm

Other: Usually faeces or from organs at post mortem

Methods of sampling (description of sampling techniques)

Animals at farm

Voluntary samples usually taken by veterinarian for diagnostic purposes

Case definition

Animals at farm

Culture and isolation of salmonella from sample taken from the animal, or associated with its environment. An incident comprises the first isolation and all subsequent isolations of the same serotype or serotype and phage/definitive type combination of a particular salmonella from an animal, group of animals or their environment on a single premises.

Diagnostic/analytical methods used

Animals at farm

Bacteriological method: Various

Animals at slaughter (herd based approach)

Bacteriological method: Various

Vaccination policy

Vaccination against Salmonella Dublin may be used on a voluntary basis. There is no restriction on using any authorised salmonella vaccine

Control program/mechanisms

The control program/strategies in place

There is no statutory national control plan for salmonella in cattle. All salmonellas isolated must be reported to the competent authority. Advice is given and visits to the farm may be made, particularly if the salmonella is of public health significance or there is direct sale of products to the public. The public health authorities are informed of isolations of salmonella from cattle. Assistance is given to the public health authorities with on-farm investigations and epidemiological studies if there is a human outbreak of salmonellosis associated with the farm.

Measures in case of the positive findings or single cases

Advice is given on contol of salmonella and farm visits may be made by the veterinary and public health authorities.

Notification system in place

All salmonellas isolated from cattle must be reported to the competent authority

Results of the investigation

The number of reports from cattle in the UK decreased slightly in 2005 to 989 from the 1218 reports in 2004. The most frequently isolated serotypes were S. Dublin and S. Typhimurium which comprised 71% and 15% of total reports respectively. There were six incidents of S. Enteritidis during 2005. The incidents involved phage types (incidents) PT1 (1), PT4 (2), PT6A (2), PT NOPT (1)..

National evaluation of the recent situation, the trends and sources of infection

The majority of incidents have been Salmonella Dublin, with Salmonella Typhimurium the second most commonly reported. The majority of incidents reported are from samples taken for diagnostic purposes, and not from samples from healthy animals. The number of recorded incidents may also have been affected by changes to the recording system (see 2004 report).

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Salmonella Dublin is the most common serotype recorded in the diagnostic samples taken. Salmonella Dublin is seldom isolated in samples from man.

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Thompson	S. Ohio	S. Agona	S. Rissen	S. Montevideo	S. Senftenberg
Gallus gallus (fowl)													
grandparent breeding flocks for egg production line	NRL	H	9	0	0	0	0						
parent breeding flocks for egg production line	NRL	H	88	6	0	0	0	1	1	1	1	1	1
grandparent breeding flocks for meat production line	NRL	H	128	0	0	0	0						
parent breeding flocks for meat production line	NRL	H	567	106	1	0	105						

Footnote

NRL is National Reference Laboratory

Table Salmonella in other poultry

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Gallus gallus (fowl)							
laying hens	NRL	H		42	17	3	22
- at farm - Monitoring (Baseline study conducted October 2004 to September 2005 Decision 2004/665)	NRL	H	454	63	28	8	27
broilers	NRL	H		378	3	6	369
Ducks	NRL	H		631	63	71	497
Geese	NRL	H		0	0	0	0
Turkeys	NRL	H		279	0	24	255

Footnote

NRL is National Reference Laboratory. H is flock or herd. Samples majority for monitoring by industry. All isolates of salmonella are reportable. It is not possible to give a figure for the number of units tested because laboratories do not report negative findings routinely unless it is part of an official control programme or survey.

Table Salmonella in other birds

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Pigeons	NRL	A		17	0	16	1
Guinea fowl	NRL	A		0	0	0	0
Quails	NRL	A		0	0	0	0
Pheasants	NRL	A		15	0	1	14
Partridges	NRL	A		0	0	0	0
Ostriches	NRL	A		2	0	0	2

Footnote

NRL is National Reference Laboratory. Mainly clinical isolates. A is animal or bird. All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey.

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Cattle (bovine animals)	NRL	H		989	6	149	834
calves (under 1 year)	NRL	H		387	1	42	344
adult cattle over 2 years	NRL	H		522	3	75	444
Sheep	NRL	H		229	0	24	205
Goats (1)	NRL	H		1	0	0	1
Pigs	NRL	H		194	0	136	58
Solipeds, domestic	NRL	H		45	3	25	17
Deer (2)	NRL	H		4	0	0	4

(1) : 61:-:1,5,7
(2) : 2 Dublin, 2 Reading

Footnote

NRL is National Reference Laboratory. Mainly clinical isolates. H is Herd. All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey.

2.1.4. Salmonella in feedingstuffs

A. Salmonella spp. in feed - all feedingstuffs

History of the disease and/or infection in the country

Great Britian
In Great Britain the isolation of Salmonella spp. from animal feedingstuffs are reportable under the Zoonoses Order 1989.
Imported animal protein destined for feed production in GB is tested according to a risk assessment.
Northern Ireland
All isolations of salmonella in a sample taken from an animal or bird or its surroundings, or from any carcase, product or feedingstuff must be reported to a veterinary inspector of the Department of Agriculture for Northern Ireland, [The Zoonoses Order (Northern Ireland) 1991]
All imported processed animal protein is sampled under the Diseases of Animals (Northern Ireland) Order 1981 and the Diseases of Animals (Importation of Processed Animal Protein) Order (Northern Ireland) 1989.

National evaluation of the recent situation, the trends and sources of infection

Salmonella was most commonly reported from cereals/vegetable feed materials during the manufacturing process, and most reports were from samples of rape, and soya where the most common serotype reported was S. Rissen and S. Senftenberg respectively. A wide range of other serotypes were reported. Salmonella Typhimurium was reported in wheat (2), rice (1),), pig feed (1), cattle feed (1).
It is not possible to determine trends from these data, but they do indicate the wide variety of salmonella serotypes which may be present in feed materials and the need to manage this risk during the production process.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Although salmonellas are found in feed materials the processes involved in animal feed production should normally eliminate them. Animal feed may become contaminated on farm if poorly stored and not kept vermin free.

Additional information

In Great Britain since 1992, laboratories have provided enhanced information on the results of monitoring for salmonella in animal feedingstuffs. The Department in conjunction with the feedingstuffs industry have introduced codes of practice for the control of salmonella. In addition to the Defra codes of practice for the control of salmonella in feedingstuffs, the Industry has also introduced codes of practice for the control of salmonella. Samples taken under the codes of practice form part of the HACCP process.

Table Salmonella in feed material of animal origin

		Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of marine animal origin									
fish meal (1)		NRL	Batch	500g		11	0	0	11

(1) : In the 11 were included 2 Give, 2 Montevideo, 1 Anatum, 1 Cerro, 1 Havana, 1, Indiana, 1 Mbandaka, 1 Oslo, 1 Rissen.

Footnote

Sample weight is recommended. Over 8000 tests on processed animal protein . All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey. A number of laboratories report all negative results by special arrangement.

Table Salmonella in other feed matter (Part A)

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. enterica subsp. arizonae	S. Agona	S. Berta	S. Corvallis	S. Ealing	S. Give	S. Livingstone	S. Mbandaka	S. Meleagridis	S. Orion	S. Anatum	S. Poona
Feed material of cereal grain origin																				
barley derived	NRL	Batch	500g		1	0	0		1											
wheat derived	NRL	Batch	500g		8	2	0				1									
rice derived	NRL	Batch	500g		4	1	0									1			1	
Feed material of oil seed or fruit origin																				
rape seed derived	NRL	Batch	500g		109	0	0			1				1		14				
soya (bean) derived	NRL	batch	500g		67	0	0			6		1	1		2	5	1	1		1
sunflower seed derived	NRL	batch	500g		6	0	0													

Footnote

Number tested in each category not known, but over 16,000 tests carried out on oil and non-oil seed grains and cereals. All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey. A number of laboratories do report negative results by special arrangement.

Table Salmonella in other feed matter (Part B)

	S. Senftenberg	S. Tennessee	Other serotypes	S. Nagoya	S. Yoruba	S. Hadar	S. Rissen	S. Oranienburg	S. Havana	S. Agama	S. Alachua	S. Cubana	S. Kedougou	S. Jerusalem
Feed material of cereal grain origin														
barley derived														
wheat derived				1		1				1			2	
rice derived												1		
Feed material of oil seed or fruit origin														
rape seed derived	3	6	6				75	1		2				
soya (bean) derived	17	2	11		11				2	2	1	2		1
sunflower seed derived	4		1						1					

Footnote

Number tested in each category not known, but over 16,000 tests carried out on oil and non-oil seed grains and cereals. All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey. A number of laboratories do report negative results by special arrangement.

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified
Compound feedingstuffs for cattle								
process control (1)	NRL	Batch	500g		8	1	0	7
Compound feedingstuffs for pigs								
process control (2)	NRL	Batch	500g		18	1	0	17
Compound feedingstuffs for poultry (non specified)								
process control (3)	NRL	Batch	500g		26	0	0	

(1) : A further 43 salmonella species unspecified from process control. Some results will relate to the final product, possibly sampled on farm. 1 Agona, 1 Binza, 1 Carno, 1 Mbandaka, 1 Montevideo, 1 Typhimurium, 1 Yoruba
(2) : Some results will relate to the final product, possibly sampled on farm. 17 included 5 Senftenberg, 4 Kedougou, 2 Yoruba, 1 Agona, 1 Livingstone, 1 Rissen, 1 Tennessee, 2 structure
(3) : Some results will relate to the final product, possibly sampled on farm.
26 included 6 Kedougou, 4 Livingstone, 4 Ohio, 2 Agona, 2 Rissen, 2 Tennessee, 6 Binza

Footnote

Sample weight recommended. Estimated over 6000 units tested on animal feed and processes. All laboratories report the isolation of salmonella. Units tested are not known because the laboratory does not report negative results unless as part of an official control programme or survey.

2.1.5. Salmonella serovars and phagetype distribution

Table Salmonella serovars in animals

Serovars		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Gallus gallus (fowl) - laying hens - at farm - Monitoring (Decision 2005/665)	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory (1)	N=		989		194	631				63	
Number of isolates serotyped	N=		989		194	631				63	
Number of isolates per type											
S. Agama			16			4				2	
S. Agona			1			5				2	
S. Ajiobo			1								

S. Anatum		30			4					
S. Bovismorbificans		3								
S. Carno		1								
S. Choleraesuis				1						
S. Coeln		1								
S. Corvallis									2	
S. Cubana					1				2	
S. Derby		1		24	1					
S. Dublin		702		1	1					
S. Enteritidis		6			23				28	
S. Give		4		1	6					
S. Gloucester					1					
S. Goldcoast		3		6	1					
S. Havana		2			5				1	
S. Idikan					11					
S. Indiana		1			2					
S. Infantis		2			6				1	
S. Kedougou		2		5	35					
S. Kentucky		1			1				1	
S. Kokomlemle		1								
S. Kottbus					4					
S. Larochelle					1					
S. Lexington					3					
S. Liverpool					17					
S. Livingstone					169				2	
S. London		3		2						
S. Mbandaka		3			24				4	
S. Meleagridis					2					
S. Menston					2					
S. Montevideo		14			14					
S. Newport		12		1	2					
S. Ohio		1		1	23					

S. Paratyphi B		1								
S. Reading				9						
S. Rissen					3					
S. Saintpaul		1								
S. Senftenberg		1			78				3	
S. Stourbridge		2								
S. Sundsvall					1					
S. Tennessee		1			1				1	
S. Thompson					21				1	
S. Typhimurium		149		136	9				8	
S. Uganda		1								
S. Virchow					12				1	
S. Yoruba					2				2	
S. 4,12:d:-									1	
other serovars (2)		17		7	5				1	
S. enterica subsp. diarizonae		5								
Not typeable					131					
Total of typed *Salmonella* isolates										

(1) : Most isolates in cattle and pigs are from diagnostic samples. Samples from poultry are mainly taken by industry for monitoring. All salmonellas are reportable to the competent authority.
(2) : In the laying hen survey one serovar was 61:-:1,5,7

Footnote

(*) M : Monitoring, C : Clinical

Table S. Enteritidis phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Gallus gallus (fowl) - laying hens - at farm - Monitoring (Isolates from survey under Decision 2005-665)	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=		7		0		19				51
Number of isolates phagetyped	N=		7				19				51
Number of isolates per type											
PT 1			1				1				2
PT 4			3				5				15
PT 6							2				7

PT 14b									1	
Not typable		1			1				8	
PT 35									8	
PT 4b					2					
PT 6a		2			2				1	
PT 12					2				1	
PT 7					3				5	
PT 5a					1				1	
PT 5c									1	
PT 24									1	
Total of typed *Salmonella* isolates										

Footnote

(*) M : Monitoring, C : Clinical
Isoalted mainly monitoring or clinical as indicated

Table Salmonella Typhimurium phagetypes in animals

Phagetype		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry		Gallus gallus (fowl) - laying hens - at farm - Monitoring (Baseline study Decision 2005-665)	
Sources of isolates		M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)	M(*)	C(*)
Number of isolates in the laboratory	N=	158			53	9				8	
Number of isolates phagetyped	N=	158			53	9				8	
Number of isolates per type											
DT 8		1				1					
DT 12		9									
DT 104		109			4	6				4	

DT 104b	9			9						
DT 120	2									
DT 170	1									
DT 193	6			29						
Not typable (1)	0			3						
DT 40	3									
DT 41	2									
DT 193a	1			4						
DT 49	5				1				1	
DT 195	0			2						
DT 85	0				1					
7 var.										
DT 135	5									
DT 1									1	
DT 141	0			1						
DT 56	3			1					1	
DT 2a	1								1	
DT 170b	1									
Total of typed *Salmonella* isolates										

(1) : DT 203

Footnote

(*) M : Monitoring, C : Clinical
Isolates from cattle and pigs are mainly from diagnostic samples.

2.1.6. Antimicrobial resistance in Salmonella isolates

The methods of collecting, isolating and testing of the Salmonella isolates are described in the chapters above respectively for each animal species, foodstuffs and humans. The serotype and phagetype distributions can be used to investigate the sources of the Salmonella infections in humans. Findings of same serovars and phagetypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

A. Antimicrobial resistance in Salmonella in cattle

Sampling strategy used in monitoring

Frequency of the sampling

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]
The isolates tested for antimicrobial resistance were from these isolates.

Type of specimen taken

In cattle over 90% of the isolates were derived from private samples taken for diagnostic purposes on farm.

Methods of sampling (description of sampling techniques)

Mainly voluntary private sampling.

Procedures for the selection of isolates for antimicrobial testing

One isolate from each incident reported.

Methods used for collecting data

Isolates from England, Wales and Northern Ireland laboratories are tested at the respective national reference laboratory.

Laboratory methodology used for identification of the microbial isolates

Modified ISO 6579:2002 in national reference laboratory. Other methods may be used in private laboratories.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

VLA historical standards based on British Society for Antimicrobial Chemotherapy standard method.

Antimicrobials used were
Tetracycline, Chloramphenicol, Ampicillin, Ceftazidime, Nalidixic acid, Trimethoprim / Sulfonamide, Sulfonamide, Streptomycin, Gentamicin, Neomycin (Kanamycin in Northern Ireland).

Breakpoints used in testing

Disc Diffusion 13mm breakpoint

Notification system in place

All salmonellas isolated in a veterinary laboratory must be reported to the competent authority. Isolates are requested by the NRL and serotyping and antimicrobial sensitivity testing is carried out at the NRL.

Results of the investigation

In England and Wales, 499 salmonella isolates were tested from cattle. 86% were fully sensitive.
For S. Enteritidis 12 samples were available in England and Wales and 92% were fully sensitive.
For S. Typhimurium in cattle in England and Wales 71 isolates were available for testing and 17% were fully sensitive. 59% showed resistance to more than 4 antimicrobials. 26 were pentaresistant ACSSuT only and 10 were ACSSuT plus one other antimicrobial. No resistance to cefotaxime, ceftazidime or ciprofloxacin was detected in Salmonella isolates from cattle.

National evaluation of the recent situation, the trends and sources of infection

The generally high level of resistance of Salmonella Typhimurium isolates is partly a reflection of the numbers of DT104 and its variants DT 104B and U302, which are commonly resistant to five or more antimicrobials.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

There is a possibility that antimicrobial resistance in organisms in animals could be transferred to organisms in humans. It needs to be noted however that the isolates reported here were mainly clinical isolates.

B. Antimicrobial resistance in Salmonella in pigs

Sampling strategy used in monitoring

Frequency of the sampling

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]
There is no official sampling of pigs. Almost 90% of incidents are recorded as the result of examining clinical samples.

Type of specimen taken

Voluntary sampling, usually taken for diagnostic purposes, and reported as above.

Methods of sampling (description of sampling techniques)

Mainly voluntary private sampling.

Procedures for the selection of isolates for antimicrobial testing

One isolate from each incident reported.

Methods used for collecting data

Isolates from England, Wales and Northern Ireland laboratories are tested at the respective national reference laboratory.

Laboratory methodology used for identification of the microbial isolates

Modified ISO 6579:2002 in national reference laboratory. Other methods may be used in private laboratories.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

VLA historical standards based on British Society for Antimicrobial Chemotherapy standard method used for testing isolates from England and Wales. In Northern Ireland NCCLS is used.
Antimicrobials used were
Tetracycline, Chloramphenicol, Ampicillin, Ceftazidime, Nalidixic acid, Trimethoprim / Sulfonamide, Sulfonamide, Streptomycin, Gentamicin, Neomycin (Kanamycin in Northern Ireland).

Breakpoints used in testing

Disc Diffusion 13mm breakpoint

Results of the investigation

In England and Wales, in 2005 398 salmonella isolates were tested from pigs. 17% were fully sensitive.
No isolates of S. Enteritidis were available for testing. For S. Typhimurium in pigs 317 isolates were available for testing and 13% were fully sensitive. 56% showed resistance to more than 4 antimicrobials. Three isolates were pentaresistant ACSSuT only. Two isolates of Salmonella Typhimurium phage type U288 were made from pigs from the same farm that were resistant to ciprofloxacin in the disc diffusion test. The ciprofloxacin MIC of these isolates is being determined.

National evaluation of the recent situation, the trends and sources of infection

It is evident that in general terms, that isolates from pigs tend to be more resistant than those

from cattle or sheep and isolates from turkeys tend to be more resistant than isolates from chickens. There is a greater prevalence of resistance in porcine Salmonella isolates compared to isolates from sheep and cattle to several antimicrobials, including ampicillin, chloramphenicol, streptomycin, trimethoprim/ sulphonamides, sulphonamides, and tetracyclines. No resistance to cefotaxime, ceftazidime was detected in Salmonella isolates from pigs.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

There is a possibility that antimicrobial resistance in organisms in animals could be transferred to organisms in humans

C. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Frequency of the sampling

In England, Wales and Scotland (GB) all isolations of salmonella must be reported - Zoonoses Order 1989.
In Northern Ireland all isolations of salmonella must be reported to a veterinary inspector of the Department of Agriculture, [Zoonoses Order (Northern Ireland) 1991]
The isolates tested for antimicrobial resistance were from these isolates.

Type of specimen taken

In poultry over 75% of the isolates were derived from private samples taken for montitoring purposes on farm.

Methods of sampling (description of sampling techniques)

Mainly voluntary private sampling.

Procedures for the selection of isolates for antimicrobial testing

One isolate from each incident reported.

Methods used for collecting data

Isolates from England, Wales and Northern Ireland laboratories are tested at the respective national reference laboratory.

Laboratory methodology used for identification of the microbial isolates

Modified ISO 6579:2002 in national reference laboratory. Other methods may be used in prevate laboratories.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

VLA historical standards based on British Society for Antimicrobial Chemotherapy

standard method.
Antimicrobials used were
Tetracycline, Chloramphenicol, Ampicillin, Ceftazidime, Nalidixic acid, Trimethoprim / Sulfonamide, Sulfonamide, Streptomycin, Gentamicin, Neomycin (Kanamycin in Northern Ireland).

Breakpoints used in testing

Disc Diffusion 13mm breakpoint

Results of the investigation

In England and Wales 778 salmonella isolates were tested from poultry (Gallus gallus). 67% were fully sensitive.
For S. Enteritidis 46 isolates were available and 44 (96%) were fully sensitive. For S. Typhimurium in poultry 10 isolates were available for testing and 40% were fully sensitive. 60% showed resistance to more than 4 antimicrobials. 4 DT104 were resistant to another antimicrobial in addition to pentaresistant ACSSuT.

National evaluation of the recent situation, the trends and sources of infection

No resistance to cefotaxime, ceftazidime or ciprofloxacin was detected in Salmonella isolates; this is an important finding since third generation cephalosporins or fluoroquinolones are important antimicrobials in the treatment of salmonellosis in humans.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

There is a possibility that antimicrobial resistance in organisms in animals could be transferred to organisms in humans.

D. Antimicrobial resistance in Salmonella in foodstuff derived from cattle

Results of the investigation

No results to report in 2005.

E. Antimicrobial resistance in Salmonella in foodstuff derived from pigs

Results of the investigation

No results to report in 2005.

F. Antimicrobial resistance in Salmonella in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

Samples from a survey detailed in section on 'Salmonella spp. in Broiler meat and products thereof'.

Type of specimen taken

See above

Methods of sampling (description of sampling techniques)

See above

Laboratory methodology used for identification of the microbial isolates

See section on Salmonella spp. in Broiler meat and products thereof

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Health Protection Agency, Colindale

Results of the investigation

No results to report in 2005.

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - in total - Monitoring - quantitative data [Diffusion method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Enteritidis
	Gallus gallus (fowl) - in total - Monitoring
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	46

Antimicrobials:	**N**	**n**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracyclines	46					1								1	1	2	3	1	1		5	16	6	1	5	1	1		1			
Amphenicols																																
Chloramphenicol	46														1	3	2	11	5	8	8	1	2	1	1		1	1	1			
Cephalosporins																																
Cefotaxim(3)	46																										4	5	13	7	1	6
Ceftazidim(4)	46																						1		5	8	9	9	1	3		5
Fluoroquinolones																																
Ciprofloxacin	46																					2	1	9	14	2	3	3	5	3		3
Quinolones																																
Nalidixic acid	46																		1	7	11	7	5	5	2	3	2	1			1	
Sulfonamides																																
Sulfonamide (1)	46										1				1	3	2	1	2	2	8	4	4		3	5	2	2	2	1	2	
Aminoglycosides																																
Streptomycin	46													1		4	11	7	7	1	4	1	4	1	2	2		1				
Gentamicin	46														1		2	13	9	5	1	4	1	4	2	2	1	1				
Neomycin	46												3	7	14	10	4	1	2	1	1	2									1	
Trimethoprim + sulfonamides(2)	46																				2			5	8	11	6	1	4	2		5
Penicillins																																
Ampicillin	46		1																			2	2	5	11	11	6	4	3	1		

(1) : Of the 2 recorded as 35mm, both were greater than 35mm.
(2) : Of the 5 recorded as 35mm, all were greater than 35mm.
(3) : Of the 5 recorded as 35mm, 4 were greater than 35mm.
(4) : Of the 6 recorded as 35mm, 3 were greater than 35mm.

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

n = Number of resistant isolates

	S. Enteritidis							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	yes				yes			
Number of isolates available in the laboratory	12		0		46		0	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines	12	0			46	1		
Amphenicols								
Chloramphenicol	12	0			46	0		
Cephalosporins								
Cefotaxim	12	0			46	0		
Ceftazidim	12	0			46	0		
Fluoroquinolones								
Ciprofloxacin	12	0			46	0		
Quinolones								
Nalidixic acid	12	0			46	0		
Sulfonamides								
Sulfonamide	12	0			46	0		
Aminoglycosides								
Streptomycin	12				46	0		
Gentamicin	12	0			46	0		
Neomycin	12	0			46	0		
Trimethoprim + sulfonamides	12	0			46	0		
Penicillins								
Ampicillin	12	1			46	1		
Fully sensitive		11				44		
Resistant to 1 antimicrobial		1				2		
Resistant to 2 antimicrobials		0				0		
Resistant to 3 antimicrobials		0				0		
Resistant to 4 antimicrobials		0				0		
Resistant to >4 antimicrobials		0				0		

Footnote

Cattle samples mainly for clinical diagnosis; poultry samples mainly monitoring.

Table Antimicrobial susceptibility testing of S. Typhimurium in Cattle (bovine animals) - at farm - Clinical investigations - quantitative data [Diffusion method]

Number of resistant isolates (n) and number of isolates with the concentration (µl/ml) or zone (mm) of inhibition equal to

	S. Typhimurium
	Cattle (bovine animals) - at farm - Clinical investigations
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	71

Antimicrobials:	**N**	**n**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Tetracyclines	71		3	10	17	19	2	1							1	1	2	1	1	5		3	2	1	1	1						
Amphenicols																																
Chloramphenicol	71		9	27	4	5									1	4	3	8	4	1	1	2		1	1							
Cephalosporins																																
Cefotaxim(2)	71																						1	2	1	3	3	12	10	14	12	11
Ceftazidim	71																		2	1			3	5	8	20	16	7	3	1	3	1
Fluoroquinolones																																
Ciprofloxacin(1)	71														1		3	3	1	3	1		10	9	14	11	9	2	2		1	1
Quinolones																																
Nalidixic acid	71		2	2		1							1				1	3	2	6	23	15	9	3	1	1	1					
Sulfonamides																																
Sulfonamide	71		8	29	11	4	1								1	1	3	2	1	2		4		1			1	1				1
Aminoglycosides																																
Streptomycin	71		1	1	3	6	9	11	8	7	2	1	1	3	3	3	4	1	3	1	1		1			1						
Gentamicin	71														6	11	18	13	9	6	4	1	2		1							
Neomycin	71						1				2	5	20	31	7		2		2					1								
Trimethoprim + sulfonamides	71		1	9											1		1			1	8	4	12	10	9	7	4	1	1		1	
Penicillins																																
Ampicillin	71		12	25	11	5														1		1	1	4	2	5	2		2			

(1) : The one at 35mm was greater than 35mm.
(2) : Of the 11 of 35mm, 5 were greater than 35mm.

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates

	S. Typhimurium									
	Cattle (bovine animals)		**Pigs**		**Sheep**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	yes		yes		yes		yes		yes	
Number of isolates available in the laboratory	71		317		13		10		37	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines	71	52	317	257	13	11	10	6	37	34
Amphenicols										
Chloramphenicol	71	45	317	184	13	11	10	6	37	34
Cephalosporins										
Cefotaxim	71	0	317	0	13	0	10	0	37	0
Ceftazidim	71	0	317	0	13	0	10	0	37	0
Fluoroquinolones										
Ciprofloxacin	71	0	317	2	13	0	10	0	37	0
Quinolones										
Nalidixic acid	71	5	317	6	13	0	10	2	37	31
Sulfonamides										
Sulfonamide	71	53	317	266	13	11	10	6	37	35
Aminoglycosides										
Streptomycin	71	46	317	219	13	10	10	6	37	35
Gentamicin	71	0	317	3	13	0	10	0	37	0
Neomycin	71	1	317	3	13	0	10	0	37	0
Trimethoprim + sulfonamides	71	10	317	178	13	4	10	2	37	1
Penicillins										
Ampicillin	71	53	317	247	13	11	10	6	37	34
Fully sensitive		12		41		2		4		2
Resistant to 1 antimicrobial		6		7		0		0		0
Resistant to 2 antimicrobials		2		5		0		0		0
Resistant to 3 antimicrobials		2		7		0		0		1
Resistant to 4 antimicrobials		7		78		0		0		0
Resistant to >4 antimicrobials		42		179		11		6		34
Number of multiresistant S. Typhimurium DT104										
with penta resistance		26		3		5		2		1
resistant to other antimicrobials		10		0		2		4		30

Table Antimicrobial susceptibility testing of Salmonella in animals

n = Number of resistant isolates

	Salmonella spp.									
	Cattle (bovine animals)		**Pigs**		**Sheep**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	yes		yes		yes		yes		yes	
Number of isolates available in the laboratory	499		398		176		778		334	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines	499	55	398	302	176	16	778	93	334	164
Amphenicols										
Chloramphenicol	499	50	398	195	176	11	778	31	334	37
Cephalosporins										
Cefotaxim	499	0	398	0	176	0	778	0	334	0
Ceftazidim	499	0	398	0	176	0	778	0	334	0
Fluoroquinolones										
Ciprofloxacin	499	0	398	2	176	0	778	0	334	0
Quinolones										
Nalidixic acid	499	5	398	8	176	0	778	31	334	37
Sulfonamides										
Sulfonamide	499	60	398	302	176	16	778	210	334	174
Aminoglycosides										
Streptomycin	499	55	398	235	176	11	778	70	334	104
Gentamicin	499	0	398	4	176	0	778	5	334	0
Neomycin	499	1	398	8	176	0	778	16	334	3
Trimethoprim + sulfonamides	499	10	398	203	176	5	778	156	334	53
Penicillins										
Ampicillin	499	60	398	255	176	12	778	31	334	63
Fully sensitive		428		66		159		519		141
Resistant to 1 antimicrobial		11		26		2		45		19
Resistant to 2 antimicrobials		6		15		2		93		35
Resistant to 3 antimicrobials		3		21		2		85		81
Resistant to 4 antimicrobials		7		81		0		20		21
Resistant to >4 antimicrobials		44		189		11		16		37

Table Breakpoints for antibiotic resistance testing of Salmonella in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

VLA_historical_standards_based_on_British_society_for_antimicrobial_chemotherapy_standard_method

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines	VLA						10	13		13
Amphenicols										
Chloramphenicol	VLA						10	13		13
Florfenicol										
Fluoroquinolones										
Ciprofloxacin	VLA						1	13		13
Enrofloxacin										
Quinolones										
Nalidixic acid	VLA						30	13		13
Trimethoprim										
Sulfonamides										
Sulfonamide	VLA						300	13		13
Aminoglycosides										
Streptomycin	VLA						25	13		13
Gentamicin	VLA						10	13		13
Neomycin	VLA						10	13		13
Kanamycin										
Trimethoprim + sulfonamides	VLA						25	13		13
Cephalosporins										
Cefotaxim	VLA						30	13		13
Ceftazidim	VLA						30	13		13
3rd generation cephalosporins										
Penicillins										
Ampicillin	VLA						10	13		13

Table Breakpoints for antibiotic resistance testing of Salmonella in Feedingstuff

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

VLA_historical_standards_based_on_British_society_for_antimicrobial_chemotherapy_standard_method

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines	VLA						10	13		13
Amphenicols										
Chloramphenicol	VLA						10	13		13
Florfenicol										
Fluoroquinolones										
Ciprofloxacin	VLA						1	13		13
Enrofloxacin										
Quinolones										
Nalidixic acid	VLA						30	13		13
Trimethoprim										
Sulfonamides										
Sulfonamide	VLA						300	13		13
Aminoglycosides										
Streptomycin	VLA						25	13		13
Gentamicin	VLA						10	13		13
Neomycin	VLA						10	13		13
Kanamycin										
Trimethoprim + sulfonamides	VLA						25	13		13
Cephalosporins										
Cefotaxim	VLA						30	13		13
Ceftazidim	VLA						30	13		13
3rd generation cephalosporins										
Penicillins										
Ampicillin	VLA						10	13		13

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

A. Thermophilic Campylobacter General evaluation

History of the disease and/or infection in the country

During the last 25 years reported cases of human illness caused by Campylobacter spp. have generally risen year on year, but have remained stable lately and appear to be declining although there was a slight increase in 2004 compared with 2003. The number of cases in 2005 was similar to that recorded in 2004. Campylobacter is the most commmonly isolated bacterial gastrointestinal pathogen. A proportion of Campylobacter isolates are speciated and indicate that Campylobacter jejuni accounts for the majority, followed by Campylobacter coli. Campylobacter are commonly found in animals but are seldom associated with disease in the animal.

National evaluation of the recent situation, the trends and sources of infection

In the UK as a whole there were 49871 cases reported in humans. This is a small increase in the number of cases reported in 2004 (49233). Increases were seen in all countries except.
Food
In 2005 studies continued on examination of whole fresh chicken at retail in two studies as outlined below.
LACORS/HPA Coordinated Local Authority Sentinel Surveillance of Pathogens (CLASSP)
A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) which is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.
The enrichment method used was based on the Food and Drugs Administration Campylobacter method (Hunt JM, Abeyta C and Tran T. Campylobacter. In: US FDA Bacteriological Analytical Manual, 8th edition, current through revision A, 1998). Food treatments, such as heating, freezing or chilling can cause sub-lethal injury to Campylobacter spp., resulting in increased sensitivity to some antibiotics and lowered resistance to elevated incubation temperatures. The FDA enrichment culture method uses Bolton broth which allows resuscitation and recovery of injured organisms. This medium will be specified in the new version of ISO 10272.
All samples were tested for the presence or absence of Campylobacter and most isolates speciated and screened for antimicrobial resistance. Out of 914 units tested, 574 were poitive for Campylobacter.
FSA/LA Wales and Northern Ireland Poultry surveillance
A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Campylobacter contamination in whole chickens available to the consumer in Wales and Northern Ireland on retail sale.
In total, 616 from 877 chickens sampled, tested positive for Campylobacter. Samples were examined for the presence or absence of Campylobacter in accordance with the HPA Standard Microbiological Food Method F21 for detection of Campylobacter spp., which is based on the

British Standard method BS 5763: Part 17: 1996, ISO 10272: 1995.Methods for microbiological examination of food and animal feeding stuffs: detection of thermotolerant Campylobacter.
Animals
No specific studies were conducted in animals in 2005. Isolates obtained from a statistically based survey of cattle and pigs arriving at GB abattoirs was conducted in 2003 and has been reported. The isolates were tested for antimicrobial resistance and these results were reported in 2004.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

The route of transmission to humans in many sporadically occurring cases remains obscure. Campylobacter are commonly found in clinically healthy animals. Poultry have long been considered as a potential source of infection.

Recent actions taken to control the zoonoses

The Food Standards Agency has continued its campaign directed at broiler producers to reduce the number of infected poultry flocks arriving at slaughter. The campaign has a number of elements but an increased awareness of the need for the highest standards of biosecurity at farm level is seen as being of high importance.

2.2.2. Campylobacter, thermophilic in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At retail

Results of the investigations published in 2005:
LACORS/HPA Coordinated Local Authority Sentinel Surveillance of Pathogens (CLASSP)
A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.
The enrichment method used was based on the Food and Drugs Administration Campylobacter method (Hunt JM, Abeyta C and Tran T. Campylobacter. In: US FDA Bacteriological Analytical Manual, 8th edition, current through revision A, 1998). Food treatments, such as heating, freezing or chilling can cause sub-lethal injury to Campylobacter spp., resulting in increased sensitivity to some antibiotics and lowered resistance to elevated incubation temperatures. The FDA enrichment culture method uses Bolton broth which allows resuscitation and recovery of injured organisms. This medium will be specified in the new version of ISO 10272.
All samples were tested for the presence or absence of Campylobacter and most isolates speciated and screened for antimicrobial resistance. Out of 914 units tested 574 were positive for Campylobacter and 301 were C. jejuni, 127 C. coli with 4 C. lari and 146 which were not speciated.
FSA/LA Wales and Northern Ireland Poultry surveillance
A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Campylobacter contamination in whole chickens available to the consumer in Wales and Northern Ireland on retail sale.
In total, 616 from 877 chickens sampled, tested positive for Campylobacter. Samples were examined for the presence or absence of Campylobacter in accordance with the HPA Standard Microbiological Food Method F21 for detection of Campylobacter spp., which is based on the British Standard method BS 5763: Part 17: 1996, ISO 10272: 1995.Methods for microbiological examination of food and animal feeding stuffs: detection of thermotolerant Campylobacter.

Frequency of the sampling

At retail

Other: Specific studies on going in 2005

Type of specimen taken

At retail

Other: fresh refrigerated poultry meat

Definition of positive finding

At retail

Isolation of the organism from the sample. In the first study The enrichment method used was based on the Food and Drugs Administration Campylobacter method (Hunt JM, Abeyta C and Tran T. Campylobacter. In: US FDA Bacteriological Analytical Manual, 8th edition, current through revision A, 1998). Food treatments, such as heating, freezing or chilling can cause sub-lethal injury to Campylobacter spp., resulting in increased sensitivity to some antibiotics and lowered resistance to elevated incubation temperatures. The FDA enrichment culture method uses Bolton broth which allows resuscitation and recovery of injured organisms. This medium will be specified in the new version of ISO 10272.
In the second study samples were examined for the presence or absence of Campylobacter in accordance with the HPA Standard Microbiological Food Method F21 for detection of Campylobacter spp., which is based on the British Standard method BS 5763: Part 17: 1996, ISO 10272: 1995.Methods for microbiological examination of food and animal feeding stuffs: detection of thermotolerant Campylobacter.

Diagnostic/analytical methods used

At retail

Bacteriological method: ISO 10272:1995

Control program/mechanisms

Recent actions taken to control the zoonoses

Food Standards Agency has continued the campaign directed at broiler production and based on intensified biosecurity measures.

Results of the investigation

Results of the investigations published in 2005:
LACORS/HPA Coordinated Local Authority Sentinel Surveillance of Pathogens (CLASSP)
A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.
The enrichment method used was based on the Food and Drugs Administration Campylobacter

method (Hunt JM, Abeyta C and Tran T. Campylobacter. In: US FDA Bacteriological Analytical Manual, 8th edition, current through revision A, 1998). Food treatments, such as heating, freezing or chilling can cause sub-lethal injury to Campylobacter spp., resulting in increased sensitivity to some antibiotics and lowered resistance to elevated incubation temperatures. The FDA enrichment culture method uses Bolton broth which allows resuscitation and recovery of injured organisms. This medium will be specified in the new version of ISO 10272.

All samples were tested for the presence or absence of Campylobacter and most isolates speciated and screened for antimicrobial resistance.

Results are detailed in Tables.

FSA/LA Wales and Northern Ireland Poultry surveillance

A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Campylobacter contamination in whole chickens available to the consumer in Wales and Northern Ireland on retail sale.

In total, 616 from 877 chickens sampled, tested positive for Campylobacter. Samples were examined for the presence or absence of Campylobacter in accordance with the HPA Standard Microbiological Food Method F21 for detection of Campylobacter spp., which is based on the British Standard method BS 5763: Part 17: 1996, ISO 10272: 1995.Methods for microbiological examination of food and animal feeding stuffs: detection of thermotolerant Campylobacter.

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. jejuni	C. upsaliensis	thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus) (1)	Survey	whole bird		914	574	127	4	301	0	142
fresh (2)	Survey	whole bird		877	616					

(1) : A three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007) and is designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.
(2) : A twelve month Food Standards Agency (FSA) study in partnership with the Local Authorities from Wales and Northern Ireland (January-December 2005) was carried out to produce an estimate of the Campylobacter contamination in whole chickens available to the consumer in Wales and Northern Ireland on retail sale.
Estimated 52% C. jejuni, 43% C. coli

Footnote

Sample weight. The sample consists of removing neck skin (the quantity can vary depending on how much neck skin is present on the chicken). Then the whole chicken is rinsed in 225 ml BPW and neck skin added to the rinse bag to produce the sample for analysis.

2.2.3. Campylobacter, thermophilic in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

No national surveys were carried out in poultry on farm in 2005.

2.2.4. Antimicrobial resistance in Campylobacter, thermophilic isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in cattle

Sampling strategy used in monitoring

Frequency of the sampling

Isolates were from a survey of GB cattle arriving for slaughter at the abattoir. See 2003 report for further details. The antimicrobial resistance in the isolates was reported in 2004.

Methods used for collecting data

.

Control program/mechanisms

The control program/strategies in place

Advice is available on the responsible use of medicines on farm.

Results of the investigation

The last survey was reported in 2004.

B. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Sampling strategy used in monitoring

Frequency of the sampling

Last survey was conducted in 2003 and the results were reported in 2004.

C. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

No surveys were conducted in 2005.

D. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from cattle

Results of the investigation

No surveys were conducted in 2005.

E. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from pigs

Sampling strategy used in monitoring

Frequency of the sampling

No surveys were conducted in 2005.

F. Antimicrobial resistance in Campylobacter jejuni and coli in foodstuff derived from poultry

Sampling strategy used in monitoring

Frequency of the sampling

The isolates were derived from the study on whole chicken part of the three year Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA) study (November 2004 to October 2007), designed to provide surveillance data on the pathogens Salmonella and Campylobacter. Part A covers the surveillance of these pathogens in raw whole chicken on retail sale.

Laboratory methodology used for identification of the microbial isolates

The enrichment method used was based on the Food and Drugs Administration Campylobacter method (Hunt JM, Abeyta C and Tran T. Campylobacter. In: US FDA Bacteriological Analytical Manual, 8th edition, current through revision A, 1998). Food treatments, such as heating, freezing or chilling can cause sub-lethal injury to Campylobacter spp., resulting in increased sensitivity to some antibiotics and lowered resistance to elevated incubation temperatures. The FDA enrichment culture method uses Bolton broth which allows resuscitation and recovery of injured organisms. This medium will be specified in the new version of ISO 10272

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Tetractycline, Ampicillin, Ciprofloxacin, Nalidixic acid, Gentamycin, Erythromycin.

Breakpoints used in testing

Health Protection Agency

Results of the investigation

Just under 7% of all the 595 isolates were fully sensitive to antimicrobials. Around 0.03% (2 isolates) were resistant to 4 or more antimicrobials.

Table Antimicrobial susceptibility testing of Campylobacter in food

n = Number of resistant isolates

	Campylobacter spp.							
	Meat from broilers (Gallus gallus)		**Meat from other poultry species**		**Meat from pig**		**Meat from bovine animals**	
Isolates out of a monitoring programme (1)	yes							
Number of isolates available in the laboratory	595							
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Fluoroquinolones								
Ciprofloxacin	595	12						
Quinolones								
Nalidixic acid	595	187						
Aminoglycosides								
Gentamicin	595	74						
Macrolides								
Erythromycin	595	11						
Penicillins								
Ampicillin	595	190						
Fully sensitive	595	40						
Resistant to 1 antimicrobial	595	220						
Resistant to 2 antimicrobials	595	186						
Resistant to 3 antimicrobials	595	79						
Resistant to 4 antimicrobials	595	7						
Resistant to >4 antimicrobials	595	2						

(1) : Surveillance in raw whole chicken on retail sale

2.3. LISTERIOSIS

2.3.1. General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/or infection in the country

Laboratory reports in UK in humans have fallen from a peak in the late 1980s following advice to pregnant women to avoid ripened soft cheeses and pates.
The number of human cases in 2005 of Listeria monocytogenes was 229, very similar to the 236 reported in 2004.
Studies were carried out in 2005 in pre-packaged mixed salads containing raw vegetables and other ingredients such as meat or seafood from retail premises and are reported below and in the tables.

National evaluation of the recent situation, the trends and sources of infection

The UK government undertakes national microbiological food surveillance. The priorities of these surveys are closely linked to a strategy to reduce the level of foodborne disease. Surveys are carried out regularly on a variety of foods and processes to gather data on the possible effects of processing changes on pathogens and to monitor high-risk foods linked to human cases/outbreaks and the emergence of new pathogens. In addition to national surveillance Wales, Scotland and Northern Ireland also have separate microbiological food surveillance programmes within their own regions.
The UK government also collates returns from all UK food authorities on official food enforcement activities in line with Regulation (EC) No 882/20041 on official controls performed to ensure the verification of compliance with feed and food law, and animal health and animal welfare rules. The results of this food testing, which is done locally, are returned to the European Commission annually as required by the Regulation and therefore have not been included in this report.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Food
Results of the investigations published in 2005:
LACORS/HPA study of bacteriological safety of pre-packaged mixed salads from retail premises for Listeria monocytogenes
The European Commission Recommendation 2005/175/EC, made under Regulation (EC) No 882/20041 and published in the Official Journal of the European Communities on 5 March 2005 required Member States to assess the microbiological quality of pre-packaged mixed salads containing raw vegetables and other ingredients such as meat or seafood from retail premises. A two month (May - June 2005) study was undertaken and co-ordinated by the Local Authority Co-ordinators of Regulatory Services (LACORS) and the Health Protection Agency (HPA), on behalf of the Food Standards Agency (FSA).
In total 2686 samples of pre-packaged mixed raw vegetable salads containing meat (47%; 1268) or seafood (53%; 1418) were examined. All samples were tested for presence or absence of

Listeria monocytogenes, and all isolates were subtyped.
Overall, Listeria monocytogenes were detected in 4.8% (130/2686) of mixed raw vegetable salad samples, of which two were above adverse levels (>=100 cfu/g).
The enrichment and enumeration methods used were the HPA Standard Microbiological Food Method for detection and enumeration of Listeria monocytogenes and other Listeria species which is based on the British Standard method BS EN ISO 11290 parts 1 and 2: Microbiological examination of food and animal feeding stuffs - Horizontal method for the detection and enumeration of Listeria monocytogenes, Parts 1 (1997) and 2 (1998).

2.3.2. Listeria in foodstuffs

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Definition used	Units tested	=<100 cfu/g	>100 cfu/g	Total units positive for L.monocytogenes	Listeria monocytogenes presence in x g
Other food									
- at retail (European Commission Recommendation 2005/175/EC) (1)	FSA	packet	100g		2686	2	2	130	126

(1) : Pre-packaged mixed salads containing raw vegetables and other ingredients such as meat or seafood from retail premises.

2.3.3. Listeria in animals

2.4. E. COLI INFECTIONS

2.4.1. General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

History of the disease and/or infection in the country

The first report in humans in England and Wales was in 1982 and in Scotland in 1984. Up to 1995 there was a rising trend in the reporting of VTEC O157 throughout the UK. Since then the number of reported cases has stabilised at approximately 1000 cases per year. Scotland has consistently recorded the highest rates per 100,000 population since the late 1980s.

National evaluation of the recent situation, the trends and sources of infection

Humans
In UK in total in 2005 there were 1129 cases of VTEC laboratory confirmed cases, an increase on the 898 laboratory confirmed cases reported in 2004. Of the 1129 cases 1119 were caused by VTEC O157. There were 38 cases of HUS (2 clinical case and 36 confirmed laboratory reports - full breakdown was not available in all regions of the country). Of these 35 were caused by VTEC O157 and one by non-O157. In 2005, the HPA Laboratory of Enteric Pathogens confirmed 932 cases of VTEC O157 in England and Wales. This represents a 33% increase of the annual total for 2004. Ten general outbreaks of VTEC O157 infection were reported of which four were foodborne, four were attributed to person to person spread and two were due to contact with animals at open farms. The increase seen in Scotland in the previous year was not maintained in 2005. In Northern Ireland there was a rise in the number of cases reported compared with the previous year.
Animals
No surveys were carried out in 2005. A survey of eligible cattle, sheep and pigs was carried out in 2003 - see report for 2003.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Foodborne outbreaks have been well documented, but many cases of VTEC O157 are sporadic (i.e., individual cases not known to be associated with any other cases) and it is often difficult to confirm a source of infection in these circumstances. A number of case control studies in GB have shown the importance of contact with animals and the animals' environment.

2.4.2. Escherichia coli, pathogenic in foodstuffs

2.4.3. Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Sampling strategy

The last survey in cattle, sheep, and pigs was conducted in 2003, and results are in the report for 2003.

2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1. General evaluation of the national situation

A. Tuberculosis General evaluation

History of the disease and/or infection in the country

Great Britain (England, Wales, and Scotland)
The dramatic progress achieved in controlling bovine TB in GB during the 1960s and 1970s stalled in the mid 1980s. The situation gradually regressed from the late 1980s and since the mid 1980s the number of TB herd breakdowns ('incidents') in GB has inexorably risen at an average annual rate of 16%, despite intensive test and slaughter programme to curb cattle-to-cattle transmission. In 2005 almost 30,000 cattle were slaughtered in GB under the TB control scheme (53 reactors per 10,000 tests) and 7.8% of herds tested contained reactors. At the end of 2005, the United Kingdom was one of 14 EU Member States not recognized as officially TB free (OTF) under Directive 64/432/EEC due to the incidence of TB in its national cattle herd. In GB, the majority of cattle herds retain their individual OTF status as the distribution of bovine TB incidents in GB still shows a high degree of geographical clustering. Areas of the South West and the West Midlands of England and the South and West of Wales account for the vast majority of confirmed incidents and test reactors. Confirmed TB incidents occur sporadically outside those regions, usually as a result of the translocation of infected cattle from areas of endemic TB. Scientific evidence suggests that in the areas of endemically high TB incidence some wild mammal species (mainly the Eurasian badger, Meles meles) constitute a significant reservoir of infection for cattle.
Northern Ireland
The incidence of the disease fell rapidly to very low levels once a compulsory eradication programme was put in place in 1960. Since then the level of the disease has remained low but full eradication has not been achieved. Annual testing has been carried out since 1982 and following that, the incidence fell to a very low level in 1988. Since 1996, there has been evidence of an increase. A number of reasons are considered to have influenced the continued incidence of the disease in cattle. These include the effect of a reservoir of the disease in feral species, cattle movements and cattle contact between small, fragmented farm holdings. Details on the Northern Ireland situtation are not included in this report.

National evaluation of the recent situation, the trends and sources of infection

Great Britain (England, Wales and Scotland) - Provisional data for 2005 collated on 7 March 2006
A total of 43,558 tuberculin tests were carried out in British herds in 2005, a 2.8% reduction on the 44,784 tests performed in 2004. However, 4.3% more animals received a tuberculin test in 2005 than in the previous year (4.8 against 4.6 million cattle). Sixty five percent of all herd tests are completed in the six-month period from November to April. Cattle herd numbers continued to decline across GB in relation to previous years (just over 90,600 herds registered at the end of 2005).
A total of 5,674 cattle herds were under TB restrictions (i.e. had their OTF status suspended) because of a TB incident at some time during 2005, compared with 5,239 herds in 2004. At the end of 2005 a total of 5,782 cattle herds were under TB restrictions (i.e. had their OTF status

suspended or withdrawn) because of a TB incident or an overdue tuberculin test. This figure represented approximately 6.4% of the national cattle herd. In other words, at the end of 2005 93.6% of the cattle herds in GB were considered OTF.

The number of new TB incidents disclosed in GB increased from 3,349 in 2004 to 3,653 in 2005 (up 9.1%). The proportion of new incidents confirmed by post mortem examination and/or culture in 2005 was 55.4% (52.7% in 2004).

For every 100 tests carried out in unrestricted cattle herds in 2005, an average of 4.4 new confirmed incidents were found. The equivalent rate for 2004 was 3.6.

A total of 30,063 cattle were slaughtered in 2005 for TB control purposes, either as tuberculin test reactors (25,755), contacts (2,595) or inconclusive test reactors (494). The 25,755 test reactors detected in 2005 represented 0.53% of the 4.8 million animal tests carried out. The average total number of reactors per TB incident starting or continuing in 2005 was 4.6, compared with 3.8 in 2004.

The number of cattle carcases with suspicious TB lesions detected at routine meat slaughter rose from 665 in 2004 (of which 58.2% were confirmed as M. bovis infections) to 774 in 2005 (of which 64.5% confirmed).

More information on TB control measures and statistics for GB are available on the Department for Environment, Food and Rural Affairs (Defra) website at:
http://www.defra.gov.uk/animalh/tb/index.htm.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

The incidence of human TB in the UK has been rising gradually since the mid 1980s and it is highest in big conurbations, particularly in London. In the UK the vast majority of cases of human TB are caused by infection with M. tuberculosis, often acquired by direct contagion from an infected human. The advent of pasteurisation of virtually all the milk supply and a compulsory TB control programme in cattle has dramatically reduced the incidence of M. bovis infection in the UK population from the levels recorded prior to the 1950s.

The sale of raw milk from cows has been banned in Scotland since 1983. A small number of registered producers in England and Wales (163 dairy cow, 44 goat and 4 sheep establishments at the end of 2004) can still legally sell raw drinking milk directly to the consumer. In the absence of compulsory pasteurisation in England and Wales, dairy cattle and buffalo herds selling milk directly to consumers undergo annual TB testing by the SVS, on the assumption that any infected cows will be identified before M. bovis colonises the udder. When the OTF status of a dairy herd is suspended, the SVS will notify the Environmental Health Department of the Local Authority, as the body responsible for ensuring that all the milk sold from such herds undergoes heat treatment. The medical authorities are also informed once infection with M. bovis is confirmed in tuberculin reactors or in cattle carcases undergoing routine meat inspection.

Every year since 1990, between 20 and 50 (typically 40) people have been diagnosed with zoonotic TB in the UK. This represents between 1.0 and 1.5% of all culture-confirmed cases of TB in humans, a proportion similar to that reported in other industrialised countries. This figure has remained stable, with no discernible positive or negative trend despite the increasing incidence of TB in cattle. The vast majority of these cases represent infections contracted abroad (i.e. classes as imported cases) or reactivation of long-standing latent infection contracted before the introduction of milk pasteurisation in the 1950s. Their geographical distribution does not mirror that of bovine TB in the cattle population. There are no documented instances of

infection associated with eating contaminated meat.
In 2005 there were 24 (provisional) cases of M bovis in humans in UK and none were known to be directly associated with contact with infected cattle. 15 cases were recorded as re-activation.

Recent actions taken to control the zoonoses

Great Britain
Once identified, reactor cattle (and, if necessary, any in-contacts) are valued and compulsorily removed. Compensation is paid to the cattle owner according to an average market value set by the Department on a monthly basis for each category of cattle. Slaughtered reactors are subject to post mortem examination by official veterinarians for evidence of macroscopic lesions of TB. Tissue specimens are collected for bacteriological culture and molecular typing. In herds with multiple reactors only a representative number of carcases will normally be sampled for bacteriological examination.
Movements of cattle on and off affected premises are immediately restricted, except for those animals consigned to slaughter. Restrictions on cattle movements are withdrawn when the herd has undergone one (or two, if infection with M. bovis was confirmed) tuberculin test at 60-day intervals with negative results. Any cattle moved out of an infected herd between the last clear test and the disclosure of reactors are traced forward and tested (if still alive on another holding). Cattle on holdings that are contiguous to an infected herd are also tuberculin tested. Six months after the restoration of OTF status affected herds undergo tuberculin check testing. If this test is negative, a second check test takes place 12 months later and, if the results are negative, the herd reverts to the normal testing frequency for the area.
Milk from dairy herds under TB restrictions destined for human consumption must undergo heat treatment (pasteurization). From 1 January 2006, the milk from tuberculin test reactors cannot enter the human food chain according to Regulation (EC) No. 853/2004 of the European Parliament. The local medical authorities are notified when M. bovis infection is confirmed in tuberculin reactors or in cattle during routine slaughter.

2.5.2. Mycobacterium in animals

A. Mycobacterium bovis in Bovine Animals

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

The UK is not officially free from TB (OTF).

Additional information

Great Britain, as a country, cannot be considered officially free from TB (OTF) under Directive 64/432/EEC due to the incidence of TB in the national herd. Nevertheless, the majority of individual cattle herds in GB enjoy OTF status.
Further information on Northern Ireland is given in separate section.

Monitoring system

Sampling strategy

Great Britain (England, Wales, and Scotland)
The TB testing programme applied in Great Britain (i.e. England, Scotland and Wales) follows the principles of Council Directive 64/432/EEC, last amended on 8 July 2002 by Commission Regulation 1226/2002.
Northern Ireland
Similar to Great Britain

Frequency of the sampling

Great Britain (England, Wales, and Scotland)
Compulsory tuberculin testing of cattle herds takes place every one to four years according to the proportion of herds in a specific area sustaining a confirmed TB breakdown over the previous 2, 4 or 6 years. At the end of 2005, 24.8 % of all cattle herds in GB were on an annual tuberculin testing frequency. The remainder were tested every two (13.8%), three (0.7%), or four (60.7%) years. TB testing intervals for the whole country are reviewed every year, to ensure compliance with Annex A of Directive 64/432/EEC. Interim adjustments may take place locally in response to a rising TB incidence. Furthermore, individual herds in 2-, 3- and 4-yearly testing areas are subject to routine annual testing if they present an increased public or animal health risk (e.g. producers of raw drinking milk from cows, herds owned by dealers, bull hirers).
Northern Ireland
All cattle herds are tested at least annually. Additional testing is carried out at the animal or herd level on a risk basis. All cattle carcases destined for human consumption are officially inspected post-mortem in accordance with the Fresh Meat Directives. Any affected carcases or parts of the carcase are disposed of and do not enter the food chain. The presence of disease is confirmed by the finding of lesions characteristic of TB in reactors, or by the culture of M. bovis in samples from any suspect carcase.

Methods of sampling (description of sampling techniques)

Great Britain (England, Wales, Scotland).
All testing of cattle for TB is by the single intradermal comparative cervical tuberculin (SICCT) test, using avian and bovine Weybridge purified protein derivative (PPD) tuberculin according to the procedure described in Annex B to Directive 64/432/EEC. The interpretation of test results is in line with this Regulation, although a more severe interpretation is applied upon confirmation of TB in a herd. The SICCT test is the only diagnostic method approved for certification of British herds as officially TB free (OTF). The in vitro gamma interferon blood test (BovigamTM) is deployed as an ancillary parallel test to help resolve persistent or severe TB breakdowns with confirmed infection, or as an alternative to a herd slaughter.
The programme of regular tuberculin herd testing is supplemented by veterinary inspection of cattle carcases during routine meat production at slaughterhouses. Where suspicious lesions of TB (granulomas) are detected at routine slaughter they are submitted for laboratory examination. Animals with tuberculous lesions at routine slaughter are traced back to the herd of origin, which is then subjected to tuberculin check testing.
Test reactors and contact animals presented for slaughter are subject to post mortem inspection. Lymph node samples or lesions of TB are submitted for laboratory examination. The affected organ or part of the carcase (or the whole carcase if more than one organ is affected) are removed and do not enter the food chain. Where inconclusive test reactors are disclosed, they are required to be isolated and retested up to two times at 60 day intervals. If reactors are found at retest, they are removed to slaughter.
All M. bovis isolates are routinely genotyped to enable epidemiological investigation of the spread and origin of TB breakdowns. Strain typing of M. bovis isolates is by spacer oligonucleotide typing (spoligotyping) and by analysis of variable number tandem repeats (VNTR).
Northern Ireland
The comparative intradermal tuberculin test as described in Annex B of Directive 64/432 is used to test all animals for tuberculosis.

Case definition

Great Britain (England, Wales, Scotland).
M. bovis infection is confirmed in test reactors and contact animals by the disclosure of characteristic gross lesions of TB and/or by culture of the bacterium from cattle specimens. In suspect TB cases detected during routine meat inspection, infection is confirmed only if M. bovis can be isolated from the suspect lesions. A confirmed TB incident (breakdown) is one in which at least one confirmed animal has been found.

Vaccination policy

Vaccination of cattle against TB is not carried out in Great Britain and is expressly forbidden by the domestic animal health legislation. Vaccination of cattle against TB is not carried out in Northern Ireland.

Other preventive measures than vaccination in place

As described under control program mechanisms.

Control program/mechanisms

The control program/strategies in place

As described in General Evaluation above.

Recent actions taken to control the zoonoses

As described in General Evaluation above

Measures in case of the positive findings or single cases

Measures are taken as described under control programs above.

Results of the investigation

These are decribed in the National evaluation of the recent situation, the trends and sources of infection above and in the tables.

National evaluation of the recent situation, the trends and sources of infection

Great Britain (England, Wales and Scotland) - Provisional data for 2005 collated on 7 March 2006

A total of 43,558 tuberculin tests were carried out in British herds in 2005, a 2.8% reduction on the 44,784 tests performed in 2004. However, 4.3% more animals received a tuberculin test in 2005 than in the previous year (4.8 against 4.6 million cattle). Sixty five percent of all herd tests are completed in the six-month period from November to April. Cattle herd numbers continued to decline across GB in relation to previous years (just over 90,600 herds registered at the end of 2005).

A total of 5,674 cattle herds were under TB restrictions (i.e. had their OTF status suspended) because of a TB incident at some time during 2005, compared with 5,239 herds in 2004. At the end of 2005 a total of 5,782 cattle herds were under TB restrictions (i.e. had their OTF status suspended or withdrawn) because of a TB incident or an overdue tuberculin test. This figure represented approximately 6.4% of the national cattle herd. In other words, at the end of 2005 93.6% of the cattle herds in GB were considered OTF.

The number of new TB incidents disclosed in GB increased from 3,349 in 2004 to 3,653 in 2005 (up 9.1%). The proportion of new incidents confirmed by post mortem examination and/or culture in 2005 was 55.4% (52.7% in 2004).

For every 100 tests carried out in unrestricted cattle herds in 2005, an average of 4.4 new confirmed incidents were found. The equivalent rate for 2004 was 3.6.

A total of 30,063 cattle were slaughtered in 2005 for TB control purposes, either as tuberculin test reactors (25,755), contacts (2,595) or inconclusive test reactors (494). The 25,755 test reactors detected in 2005 represented 0.53% of the 4.8 million animal tests carried out. The average total number of reactors per TB incident starting or continuing in 2005 was 4.6, compared with 3.8 in 2004.

The number of cattle carcases with suspicious TB lesions detected at routine meat slaughter rose from 665 in 2004 (of which 58.2% were confirmed as M. bovis infections) to 774 in 2005 (of which 64.5% confirmed).

More information on TB control measures and statistics for GB are available on the Department for Environment, Food and Rural Affairs (Defra) website at:
http://www.defra.gov.uk/animalh/tb/index.htm.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

These are described in the General Evaluation above.
In 2005 there were 24 (provisional) cases of M bovis in humans in the UK and none were known to be directly associated with contact with infected cattle. 15 were considered to be re-activation.

Additional information

Public health advice is given to herd keepers of infected herds and health authorities are advised of incidents. Purchasers of bulk milk are advised of application of restrictions to their suppliers.

B. Mycobacterium bovis in farmed deer

Monitoring system

Sampling strategy

Deer (Farmed and Park)
(England, Scotland, Wales)
Under the Tuberculosis (Deer) Order 1989 (as amended), TB in deer became notifiable in Great Britain on 1 June 1989. Any owner or person in charge of deer is required to notify the presence of affected or suspected animals to the State Veterinary Service. Under the same order, the SVS have statutory powers to enforce TB testing at the expense of the owner. Premises on which TB is suspected or confirmed may be put under movement restrictions pending further investigations. However, post mortem, culture and epidemiological investigations from suspected animals are normally undertaken by the Agriculture Departments at public expense. The Tuberculosis (Deer) Notice of Intended Slaughter and Compensation Order, 1989 came into force on 1 September 1989 and requires the slaughter of reactors with the payment of compensation and, in appropriate circumstances, enables Defra to slaughter deer exposed to infection.
There is no compulsory routine tuberculin testing for the approximately 30,000 farmed and 25,000 park deer kept in GB. Any tuberculin testing is limited to deer placed under TB restrictions following reports of TB in carcases. Therefore, surveillance for TB in deer relies almost exclusively on post mortem inspections of farmed, park and wild deer culled for venison production and ad hoc submissions of wild deer carcases. Live deer intended for export to EC Member States are also tested in the 30 days prior to export, according to EC rules. As with cattle, tuberculin testing of deer is by the SICCT test. All testing of deer, apart from that for imported animals, is carried out at the expense of the owner. Reactors are compulsorily slaughtered and compensation paid at 50% of their market value up to a ceiling of £1,200 (i.e. the maximum compensation payable is £600).

Methods of sampling (description of sampling techniques)

If lesions suggestive of TB are found in farmed and park deer at slaughter the herd of origin is back traced and movements of animals and carcases onto or off the premises are restricted. Affected farmed deer herds are placed under movement restrictions and tuberculin testing is carried out at 120-day intervals until negative results are obtained. In

park deer herds, where these testing requirements are almost impossible to fulfil, the premises may be under permanent restrictions unless de-stocked. Tuberculin testing is carried out on contiguous cattle premises.

Vaccination policy

Vaccination is not permitted.

Measures in case of the positive findings or single cases

If lesions suggestive of TB are reported in farmed and park deer at slaughter the herd of origin is back traced and movements of animals and carcases onto or off the premises are restricted. Affected farmed deer herds are placed under movement restrictions and tuberculin testing is carried out at 120-day intervals until negative results are obtained. In park deer herds, where these testing requirements are almost impossible to fulfil, the premises may be under permanent restrictions unless de-stocked. TB testing is carried out on contiguous cattle premises. Lesions suggestive of TB found in wild deer by stalkers and huntsmen are sent for bacteriological culture to identify the causative organism. If M. bovis is isolated, all cattle herds located within 3 km of the tuberculous carcase must undergo tuberculin check testing.

Notification system in place

TB in deer became notifiable in Great Britain on 1 June 1989, under the Tuberculosis (Deer) Order 1989 (as amended).

Results of the investigation

During 2005 in Great Britain, M. bovis infection was confirmed in 33 of 110 carcases with suspicious tuberculous lesions reported to the State Veterinary Service. The vast majority of samples and carcases were submitted by deer stalkers and game keepers and were not part of a systematic sampling strategy. All positive submissions were from wild deer shot or found dead in southwest England, except one farmed red deer (Cervus elaphus) and one fallow deer (Dama dama) buck shot in an enclosed park herd.

National evaluation of the recent situation, the trends and sources of infection

Due to the persistence of M. bovis infection in cattle and badgers in parts of England and Wales, occasional spillover of infection to other mammals is not unusual. Lesions typical of TB have been observed sporadically in deer in GB for many years. M. bovis infection has been confirmed in five of the six species of wild deer present in the country, with variable frequency depending on the species and geographical area. Every year about 20% of the national wild deer population is culled. Statutory submissions of deer carcases with suspect TB lesions suggest that the incidence of bovine TB in wild deer herd is low and localised. Meat inspection of farmed deer provides an additional source of surveillance data to support the view that TB is not widespread in the farmed deer population. Although meat from wild deer destined for the domestic market will not be subject to statutory meat inspection until 1st January 2006, stalkers and deer managers may receive training in carcase inspection and have a statutory obligation to report suspicion of disease to the local DVM.

Northern Ireland

There are 3 species of wild or feral deer in the province and surveys in the mid-1990s

demonstrated widespread TB infection, principally in red deer (Cervus elaphus) and fallow deer (Dama dama) with a prevalence of 8% (4.8% if one heavily infected locality was excluded). However, the low number of deer (less than 3,500 estimated), their restricted range, limited contact with cattle, and the enteric nature of the infection, suggests that their role is likely to be limited if not entirely insignificant.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

No cases of human M. bovis infection due to close contact with tuberculous deer or their carcases have ever been reported in UK.

C. M. bovis in animal - Cattle (bovine animals) - Control programme (Northern Ireland)

Monitoring system

Sampling strategy

All cattle herds are tested at least annually. Additional testing is carried out at the animal or herd level on a risk basis. All cattle carcases destined for human consumption are officially inspected post-mortem in accordance with the Fresh Meat Directives. Any affected carcases or parts of the carcase are disposed of and do not enter the food chain. The presence of disease is confirmed by the finding of lesions characteristic of TB in reactors, or by the culture of M. bovis in samples from any suspect carcase.

Frequency of the sampling

As detailed in sampling strategy

Methods of sampling (description of sampling techniques)

The comparative intradermal tuberculin test as described in Annex B of Directive 64/432 is used to test all animals for tuberculosis.

Case definition

The presence of disease is confirmed by the finding of lesions characteristic of TB in reactors, or by the culture of M. bovis in samples from any suspect carcase.

Diagnostic/analytical methods used

Measures in case of positive findings:
Where inconclusive reactors to tests are detected, they are required to be isolated and retested until their status has been resolved. If positive reactors are detected at test, they are removed to slaughter. Lymph node samples or lesions of tuberculosis are submitted for laboratory examination. Where lesions of tuberculosis are suspected at routine slaughter they are also submitted for laboratory examination.

Vaccination policy

Vaccination of animals against TB is not carried out.

Other preventive measures than vaccination in place

Movement restrictions are placed on the herd and remain in place until the status of the herd has been resolved. Removal of restrictions are dependent upon the herd giving negative results to one herd test if the disease is not confirmed, or negative results to two consecutive herd tests in infection is confirmed. Cleansing and disinfection of the premises where the disease has been identified in the herd is also required. A trace on the movements of animals into and out of the herd prior to the detection of infection are carried out using a computerised database which records all animal movements as well as tuberculosis, brucellosis and other disease data. Traced animals or herds may be placed under movement restriction until appropriate tests have been carried out. Public health advice is given to the herd keeper and health authorities are informed.

Measures in case of the positive findings or single cases

Where inconclusive reactors to tests are detected, they are required to be isolated and retested until their status has been resolved. If positive reactors are detected at test, they are removed to slaughter. Lymph node samples or lesions of tuberculosis are submitted for laboratory examination. Where lesions of tuberculosis are suspected at routine slaughter they are also submitted for laboratory examination.
Movement restrictions are placed on the herd and remain in place until the status of the herd has been resolved. Removal of restrictions are dependent upon the herd giving negative results to one herd test if the disease is not confirmed, or negative results to two consecutive herd tests in infection is confirmed. Cleansing and disinfection of the premises where the disease has been identified in the herd is also required. A trace on the movements of animals into and out of the herd prior to the detection of infection are carried out using a computerised database which records all animal movements as well as tuberculosis, brucellosis and other disease data. Traced animals or herds may be placed under movement restriction until appropriate tests have been carried out. Public health advice is given to the herd keeper and health authorities are informed.

Results of the investigation

Results of the investigations in 2005 in Northern Ireland are not included in this report.

National evaluation of the recent situation, the trends and sources of infection

Epidemiological history:
The epidemiological history was described in the 2004 report.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

There were 5 human cases of M. bovis in Northern Ireland in 2005 and 2 of these were considered to be reactivation of previous cases. See Section on M. bovis in humans for further details.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Sheep (1)	NRL	A	4	3	2	0	1
Goats (2)	NRL	A	3	0			
Pigs (3)	NRL	A	36	23	12	0	11
Ferrets (4)	NRL	A	7	3	3	0	0
Lamas (5)	NRL	A	4	1	1	0	0
Cats (6)	NRL	A	98	34	12	0	22

(1) : Individual animals with suspicious lesions or clinical signs
(2) : Individual animals with suspicious lesions or clinical signs
(3) : Individual animals with suspicious lesions or clinical signs
(4) : Individual animals with suspicious lesions or clinical signs
(5) : Individual animals with suspicious lesions or clinical signs
(6) : Individual animals with suspicious lesions or clinical signs

Footnote

Data from GB i.e., England, Wales, Scotland

Table Bovine tuberculosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total - 1					2324	15084								

Table Bovine tuberculosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Total number of existing bovine		Officially free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds (Annex A(I)(2)(c) third indent (1) of Directive 64/432/EEC)	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
UNITED KINGDOM (1)	90633	8500000	84851	93.6	3187	3.4		4840515		774	499
Total	90633	8500000	84851	93.6	3187	3.4	0	4840515	0	774	499

(1) : England, Wales Scotland data. 24.8% tested once per year, 13.8% every 2 years, 0.7% every 3 years, 60.7% every 4 years.
Pre-movement testing became compulsory in Scotland in September 2005, in England in March 2006 and Wales in May 2006. 774 carcases investigated after disclosure of lesions at routine slaughter (test reactors excluded). Test reactors are excluded from the 499 figure

Footnote

Data for Great Britain - England, Wales, Scotland

Table Tuberculosis in farmed deer

Region	Total number of existing farmed deer		Free herds		Infected herds		Routine tuberculin testing		Number of tuberculin tests carried out before the introduction into the herds	Number of animals with suspicious lesions of tuberculosis examined and submitted to histopathological and bacteriological examinations	Number of animals detected positive in bacteriological examination
	Herds	Animals	Number of herds	%	Number of herds	%	Interval between routine tuberculin tests	Number of animals tested			
UNITED KINGDOM (1)	12	1	300	30000							
Total	12	1	300	30000	0	0	0	0	0	0	0

(1) : No routine tuberculin tests carried out in deer. The number of animals and herds is approximate. Official post mortem examination of all slaughtered animals implemented. Results refer to Great Britain - England, Wales, Scotland.

Footnote

Data for Great Britain -England, Wales, Scotland.

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

A. Brucellosis General evaluation

History of the disease and/or infection in the country

Great Britain - England, Wales, Scotland
All cattle herds within Great Britain achieved Officially Brucellosis Free (OBF) status on 1 October 1985. As this status was maintained up to 1989, Great Britain moved to biennial testing in accordance with Directive 64/432/EC in 1989. GB achieved regional freedom in 1996.
Northern Ireland
During the period 1990 to 1996, outbreaks of Brucellosis were sporadic, with significant clustering restricted to the southern part of the province. During 1997, three primary outbreaks resulted in secondary and tertiary spread to more than 60 farms; infection was largely resolved in two of the areas but between-herd spread continued in Counties Down and Armagh.
In general, there has been a reduction in cattle herd incidence within the regions, particularly in the southern and western parts.
Other Brucella species UK
Brucella melitensis, B. ovis, and B. suis have never been recorded in United Kingdom.

National evaluation of the recent situation, the trends and sources of infection

Great Britain - England, Wales, Scotland
During the year 2005 there were no cases of brucellosis of cattle in Great Britain which has retained its Officially Brucellosis Free Status.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Great Britain England, Wales, Scotland
Cases of brucellosis in humans are recorded associated with infection acquired outside Great Britain.
Northern Ireland
In Northern Ireland cases of brucellosis are associated with infection in cattle. From 1986 to 1997 there were no reported cases of brucellosis in humans. During 1998 one case was reported in a member of a family whose cattle herd was also confirmed with Brucella abortus. Between 1999 and 2004 there were 101 reported cases of human brucellosis, 80 of which were thought to have been acquired occupationally. Five cases were female, and the remainder were male. Those affected included farmers (n=69), abattoir workers (n=6) and veterinarians (n=2).
In 2005 there were 2 cases reported, both of whom were male, and one was thought to have been occupationally acquired. Occupational details on the second are still being sought.

2.6.2. Brucella in foodstuffs

2.6.3. Brucella in animals

A. Brucella abortus in Bovine Animals

Status as officially free of bovine brucellosis during the reporting year

The entire country free

(England, Scotland, Wales)
GB is officially free of infection from Brucella abortus, Brucella melitensis, Brucella ovis and Brucella suis.

Free regions

England, Wales, Scotland. The situation in Northern Ireland is described separately.

Monitoring system

Sampling strategy

Great Britain (England, Wales, Scoland)
As in previous years in 2004 the principle surveillance system in 2005 was monthly testing of bulk milk samples from dairy herds by the ELISA test, together with biennial blood testing, by indirect ELISA, of adult cattle in beef herds and non-milking cattle in dairy
herds. All abortions and premature calvings are required to be reported. These are investigated by a veterinary surgeon in all beef herds and in some dairy herds based on risk analysis. Samples are taken from aborting animals and those calving prematurely (271 days or less from insemination), and tested both serologically and culturally.

Frequency of the sampling

See sampling strategy

Type of specimen taken

Other: Blood, milk, organ/tissues as appropriate

Case definition

Infection is confirmed on culture and isolation of the organism.

Diagnostic/analytical methods used

Serology and culture.

Vaccination policy

Vaccination of animals is not allowed.

Measures in case of the positive findings or single cases

England, Wales, Scotland
Herds giving positive results to the milk ELISA test are subjected to follow-up investigations by blood testing individual cattle. Cattle sera giving positive results to the indirect ELISA are also subjected to the serum agglutination test and complement fixation test.
Herd restrictions which stop the movement of animals off the premises, except under the authority of a licence, are imposed once a reactor is identified (before laboratory confirmation). The animal is required to be kept in isolation and slaughtered within 21 days. Other animals on the farm can be sent, under licence, to a slaughterhouse, but no other movements are permitted until the incident is resolved. Investigations into contact with contiguous herds are undertaken to assess the risk of the infection spreading. Tracing is carried out and animals which have left the infected herd since the last negative herd test are tested. The most recent female calf of a reactor is slaughtered as a dangerous contact unless testing makes it unlikely that the dam was positive at the last calving. For confirmed breakdowns in Great Britain, a herd slaughter is usually carried out. All contiguous herds are tested as well as herds with cattle movements to and from the affected herd. Before restrictions can be lifted the premises has to be cleansed and disinfected with an approved disinfectant and subjected to veterinary inspection.
Animals (reactors, infected and contact) are valued before compulsory slaughter. The amount of compensation varies depending on whether the animal is a reactor or a contact. In the case of reactors and infected cattle compensation is paid to a limit of 75% of the average market value subject to a ceiling based on market returns obtained two months prior to the month in which the animal is valued. In the case of contact animals 100% of the value is paid with no upper limit. The payment which could otherwise be made under Commission Regulation 716/96 is used to determine the market value of cattle aged over 30 months unless their value on the open market would be greater. Whenever the OBF status of a dairy herd is suspended, the Environmental Health Department of the Local Authority is informed so that a heat treatment order may be served to ensure all milk is heat treated before human consumption.

Notification system in place

All herds within Great Britain achieved Officially Brucellosis Free (OBF) status on 1 October 1985. All abortions and premature calvings are required to be reported. These are investigated by a veterinary surgeon in all beef herds and in some dairy herds based on risk analysis. Samples are taken from aborting animals and those calving prematurely (271 days or less from insemination), and tested both serologically and culturally.

Results of the investigation

England, Wales, Scotland
Results of the investigations in 2005:
During the year the Veterinary Laboratories Agency tested 856,595 blood samples from 30,485 herds as part of the national surveillance programme.
Routine monitoring of 7,968 cattle abortions and premature calvings was carried out; all results were negative.
Twenty four (24) ELISA positive bulk milk samples were reported from 202,344 bulk milk samples collected from 16,862 dairy herds. None of these led to identification of infection in cattle on subsequent investigation.

National evaluation of the recent situation, the trends and sources of infection

England, Wales, Scotland
All herds within Great Britain achieved Officially Brucellosis Free (OBF) status on 1 October 1985. As this status was maintained up to 1989, Great Britain moved to biennial testing in accordance with Directive 64/432/EC in 1989. GB achieved regional freedom in 1996; this has been retained since then.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

England, Wales, Scotland.
As livestock in GB are officially free of infection from Brucella abortus, Brucella melitensis, Brucella ovis and Brucella suis, they are not regarded as likely sources of new cases of infection in humans.
Some cases of chronic human infections may have been acquired from cattle before B. abortus was eradicated.
Further information is given in the section on brucellosis in humans in Great Britain.

B. Brucella melitensis in Sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

Brucella melitensis and Brucella ovis have never been recorded in animals in United Kingdom. The country remains Officially Brucellosis-free.

Monitoring system

Sampling strategy

During 2005 surveillance for freedom from B. melitensis was provided for by routine surveillance of samples submitted from cases of abortions and by structured survey.

Vaccination policy

No vaccination is permitted.

Notification system in place

Brucella in sheep is a notifiable disease under the national legislation. Isolation of the organism in a laboratory must also be reported to the competent authority.

Results of the investigation

During the year 2005 surveillance for brucellosis was provided by the national sheep and goat survey; 15,019 blood samples from 1,628 flocks or herds were tested, all with negative results.

National evaluation of the recent situation, the trends and sources of infection

The country remains officially brucellosis free. Brucella melitensis and Brucella ovis have never

been recorded in animals in United Kingdom.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

There is no evidence of humans being infected with brucellosis associated with sheep in the UK.

C. Brucella melitensis in Goat

Status as officially free of caprine brucellosis during the reporting year

The entire country free

The UK is officially free of caprine brucellosis. Brucella melitensis has never been recorded in the UK.

Monitoring system

Sampling strategy

A sample of flocks is checked each year.

Frequency of the sampling

Annual sampling.

Case definition

Isolation of the organism.

Diagnostic/analytical methods used

Microbiological techniques to confirm. Serology to monitor.

Vaccination policy

Vaccination is not permitted.

Results of the investigation

In 2005 no evidence of infection was found. 1682 flocks of sheep and goats were tested and all 15019 individual animals were negative.

National evaluation of the recent situation, the trends and sources of infection

UK remains free of Brucella melitensis.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Brucella melitensis infection in man is acquired from outside the UK.

D. B. suis in animal - Pigs

Results of the investigation

Epidemiological history
Brucella suis has never been recorded in animals in Great Britain or Northern Ireland. Boars intended to be used as donors for Artificial Insemination are tested; all with negative results.

National evaluation of the recent situation, the trends and sources of infection

Brucella suis has never been recorded in the UK.

E. B. abortus in animal - Cattle (bovine animals) - Control programme - mandatory (Northern Ireland)

Monitoring system

Sampling strategy

Surveillance system:
The Department of Agriculture and Rural Development for Northern Ireland carries out a programme of blood and milk testing of all herds containing breeding stock. In the 3 divisions with the highest incidence of brucellosis the blood sampling is carried out annually. The remainder of the regions have biennial sampling. The blood samples are tested by means of a serum agglutination test (SAT) in accordance with Annex C of Directive 64/432/EEC. If any SAT reading > 30 iu is detected at this test, the sample is again tested by means of an SAT (EDTA) test and complement fixation test (CFT). Any animal giving an SAT test result of >30 i.u. of agglutination per ml or any CFT reading is classified as an inconclusive reactor and is required to be isolated and retested. Cull cattle being slaughtered at OTMS (Over Thirty Month Scheme) slaughter plants are routinely blood sampled. In addition, monthly bulk milk samples, which are collected by the dairies, are tested at the central government laboratory using an ELISA kit. Premovement testing of BR eligible cattle was introduced in the autumn of 2004.
Notification of Abortions:
Herd keepers and veterinary surgeons are required under the Brucellosis Control Order (Northern Ireland) 1972 to notify a Divisional Veterinary Office if any bovine animal has aborted or, on calving, has retained the afterbirth for a period in excess of 24 hours. A restriction notice is issued for these animals, prohibiting their movement off the premises and requiring them to be isolated. The animals are tested by the DARD Veterinary Service using both SAT and CFT until a negative test at 21 days post calving is obtained.

Frequency of the sampling

As described in surveillance strategy.

Type of specimen taken

Other: blood, milk, tissues/organs

Case definition

Culture and isolation of the organism.

Vaccination policy

Vaccination policy:
Vaccination of animals is not allowed.

Control program/mechanisms

The control program/strategies in place

The control program and strategies in place were described in detail in the 2004 report.

Measures in case of the positive findings or single cases

Measures in case of positive findings:
Herd restrictions, which stop the movement of animals onto and off the premises, except under the authority of a licence issued by the Department, are imposed once a reactor is identified. The reactor/s is required to be kept in isolation until slaughtered.
When the presence of Brucella abortus is confirmed by culture of tissue samples taken at point of slaughter either:
all breeding and potential breeding animals (reactors, infected and contact) are valued and slaughtered; or
the breeding animals in the herd are subject to routine testing.
The OBF status of the herd is not restored until at least two clear herd tests have been completed, the last test being at least 21 days after any animals pregnant at the time of the outbreak have calved. In practice, this may mean the restriction and testing of all breeding cattle in a herd through an entire calving cycle.
The amount of compensation varies depending on whether the animal is a reactor or a contact. In the case of reactors, compensation is paid to a limit of 75% of the average market value subject to a ceiling based on market returns. In the case of contact animals, 100% of the value is paid with no upper limit. Where a herd keeper does not agree with the valuation as assessed by a DARD valuation officer, there is recourse to an independent valuer.
Investigations into contact with contiguous herds are undertaken to assess the risk of spread of infection. Herds of origin, transit herds or other herds considered to be at risk are tested. Forward tracing is carried out and animals which have left the infected herd since the last negative herd test, are tested. All contiguous herds are tested as well as herds with cattle movements to and from the affected herd. Before restrictions can be lifted, the premises has to be cleansed and disinfected with an approved disinfectant and subjected to veterinary inspection.

Results of the investigation

In 2005 25,392 herds were checked; 94 herds were positive with 88 new herds positive during the period. 911,791 animals were tested individually and 384 were positive.

National evaluation of the recent situation, the trends and sources of infection

Historical data on the epidemiological evolution of the disease:
There are over 1.6 million cattle in Northern Ireland.
Results of tests carried out in 2005 are given in the tables.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

In Northern Ireland human cases of brucellosis occur which are associated with occupational contact with infected cattle. Further details are given in the section on brucellosis in humans in Northern Ireland.

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Pigs	NRL	Animal	38	0				
Dogs	NRL	Animal	2496	0				
Other animals (1)	NRL	Animal	101	5				5

(1) : Marine mammals

Footnote

NRL is National Reference Laboratory

Table Bovine brucellosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds period herd prevalence	% new positive herds - herd incidence
NORTHERN IRELAND (1)	28263	28263	25392	94	88	22	23.404	89.842	0.37	0.347
Total	28263	28263	25392	94	88	22	23.404	89.842	0.37	0.347
Total - 1										

(1) : Total number of herds is the number of cattle herds in which cattle were presented at a Br test during the last 4 years. Number of herds checked is herds where number of cattle is greater than or equal to 0.

Footnote

Prevalence and incidence figures calculated using the herds which presented cattle at a herd test gives a prevalence of 0.436 and incidence of 0.408

Table Bovine brucellosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of new positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
NORTHERN IRELAND	1665608	924687	973570	911791	384	384	2964	105.286	0.039
Total	1665608	924687	973570	911791	384	384	2964	105.286	0.039
Total - 1									

Footnote

Number of animals to be tested under the programme is based on the average number of cattle presented at BR herd tests over the last 4 years. 98.6% animal coverage for individual tests. Indicators greater than 100% because of repeat herd testing and births and deaths throughout the year. Denominator also an estimate based on average herd size over the last 4 years.

Table Bovine brucellosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
NORTHERN IRELAND	28263	924687	0	0	28	3050	89	6890	53	1870			28093	912877
Total	28263	924687	0	0	28	3050	89	6890	53	1870	0	0	28093	912877
Total - 1														

Table Bovine brucellosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Total number of existing bovine		Officially free herds		Infected herds		Surveillance						Investigations of suspect cases								
							Serological tests			Examination of bulk milk samples			Information about abortions			Epidemiological investigation					
	Herds	Animals	Number of herds	%	Number of herds	%	Number of bovine herds tested	Number of animals tested	Number of infected herds tested	Number of bovine herds tested	Number of animals or pools tested	Number of infected herds	Number of notified abortions whatever cause	Number of isolations of Brucella infection	Number of abortions due to Brucella abortus	Number of animals tested with serological blood tests	Number of suspended herds	Number of positive animals		Number of animals examined microbio logically	Number of animals positive microbio logically
																		Serologically	BST		
UNITED KINGDOM (1)	87000	10000000	87000	100	0	0	30485	856595	0	16862	0	7968	0	0	960	202344	16	20		0	20
Total	87000	10000000	87000	100	0	0	30485	856595	0	16862	0	7968	0	0	960	202344	16	20	0	0	20

(1) : England, Wales, Scotland only

Ovine or Caprine Brucellosis in countries and regions that do not receive Community co-financing for eradication programme

Region	Total number of existing ovine / caprine		Officially free herds		Infected herds		Surveillance			Investigations of suspect cases				
	Herds	Animals	Number of herds	%	Number of animals	%	Number of herds tested	Number of animals tested	Number of infected herds	Number of animals tested with serological blood tests	Number of animals positive serologically	Number of animals examined microbio logically	Number of animals positive microbio logically	Number of suspended herds
UNITED KINGDOM	117000	3500000	117000	100	0	0	1682	15019	0	0	0	0	0	0
Total	117000	3500000	117000	100	0	0	1682	15019	0	0	0	0	0	0

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/or infection in the country

A small number of human cases are reported each year on a voluntary basis.

National evaluation of the recent situation, the trends and sources of infection

There is no obvious increase or decrease in the number of reports. A total of 64 were recorded in 2005 compared with 68 in 2004.
No food or animal surveys were conducted in 2004. A survey of cattle, sheep and pigs in GB eligible for slaughter was carried out in 2003 (see 2003 report).

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Trasmission usually occurs by ingestion of contaminated food or water and less commmonly by direct contact with infected animals, and rarely from person-to-person spread by the faecal oral route.

2.7.2. Yersinia in foodstuffs

2.7.3. Yersinia in animals

A. Yersinia enterocolitica in pigs

Monitoring system

Sampling strategy

Animals at farm

The last survey of pigs was conducted in 2003 and reported in 2003. It consisted of statistically based survey and examination of faeces of pigs arriving for slaughter in GB abattoirs.

2.8. TRICHINELLOSIS

2.8.1. General evaluation of the national situation

A. Trichinellosis General evaluation

History of the disease and/or infection in the country

Humans
No known cases of human trichinellosis acquired from infected meat from animals reared in the UK have been identified since 1975.
There were no laboratory-confirmed cases of Trichinellosis between 1987 and 2000. An outbreak of 8 cases was reported in 2000 and was traced to pork salami sent as a gift from outside the UK. One case, believed to have been acquired overseas, was recorded in 2001. No cases were recorded in 2002, 2003, 2004 or 2005
Animals
There was no evidence to indicate that trichinellosis exists in the UK domesticated pig population or in horses in 2005. The last positive diagnosis in pigs in Great Britain was in 1978. The last confirmed case of Trichinellosis was in 1979 in pig meat from a farm in Northern Ireland. This case was linked to suspected illegally imported meat. An on-going survey of foxes has not idenified Trichinella.

National evaluation of the recent situation, the trends and sources of infection

Great Britain
There was no evidence in 2005 that Trichinellosis existed in pigs or horses in GB in 2005.
Northern Ireland
There is no evidence to indicate that trichinellosis exists in the Northern Ireland domestic pig population or in horses. No true wild boar exists in Northern Ireland.
Wildlife - foxes
An on-going survey of trichinella in foxes was carried out in 2005. All were negative for trichinella.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Finding of cases in humans would be as a result of imported cases.

2.8.2. Trichinella in animals

A. Trichinella in pigs

National evaluation of the recent situation, the trends and sources of infection

There was no evidence from examination of pigs and horses of Trichinella spp. in 2005. A survey of foxes also did not find any evidence of Trichinella.

B. Trichinella in horses

Monitoring system

Sampling strategy

Examination for parastie at slaughterhouse under meat hygiene regulations.

Frequency of the sampling

Each carcase

Type of specimen taken

As per legislation.

Case definition

Isolation of parasite.

Results of the investigation including the origin of the positive animals

No positive findings in 2005.

Notification system in place

Notified to the Meat Hygiene Service and the Veterinary Services.

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total animals positive for Trichinella	T. spiralis	Trichinella spp., unspecified
Pigs (1)	DARD	Animal	919529	0	0	0
- at slaughterhouse (Samples sent from pig slaughterhouses to VLA lab for testing.)	NRL	Animal	5316	0	0	0
Solipeds, domestic						
horses (2)	DARD	Animal	134	0	0	0
- at slaughterhouse (Samples sent from horse slaughterhouse to VLA NRL for examination)	NRL	Animal	2367	0	0	0
Foxes	FSA	Animal	666	0	0	0

(1) : Northern Ireland data
(2) : Northern Ireland

Footnote

No trichinella was reported in any other samples examined.

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

A. Echinococcus spp general evaluation

History of the disease and/or infection in the country

Echinococcus granulosus is present in restricted geographical areas in Scotland and in England and Wales the incidence in humans is highest in mid-Wales. E. multilocularis is not known to be present in the UK .

In England and Wales in humans voluntary reports fluctuated between 5 and 26 per annum from 1989 to 1996 when 44 were recorded, the highest total in recent years. Laboratory reports totalled 14 in 1997, a large fall from 1996. In Scotland reports of cases are infrequent averaging less than 1 per year. A study covering hospital records over the period 1968-89 identified 66 cases of whom 36 were managed surgically. There were no deaths.

Animals

Echinococcosis (hydatid disease) in animals is not reportable in Great Britain and the identification of the parasite in animal tissues is not reportable. Identification of the cyst at meat inspection in animal tissues requires the condemnation of all or part of the carcase and/or the offal as may be judged appropriate to the circumstances of the case by an inspector or Official Veterinary Surgeon. In Northern Ireland Veterinary Service staff are situated in all meat plants and carry out post mortem inspection of all carcases, including inspected for evidence of hydatid cysts.

No cases of hydatidosis (echinococcosis) were detected in Northern Ireland in 2005. The last cases recorded were from imported Alpacas over 10 years ago.

National evaluation of the recent situation, the trends and sources of infection

Humans

There were 9 cases of Echinococcus granulosus in UK in 2005 - all in England and Wales. This is similar to the 8 cases recorded in 2004.

Animals

In GB hydatid disease is present in the sheep population. Findings at post mortem are not recorded centrally.

No cases of hydatidosis (echinococcosis) were detected in Northern Ireland in 2005. The last cases recorded were from imported Alpacas over 10 years ago.

E. multilocularis is not known to be present

2.9.2. Echinococcus in animals

Table Echinococcus spp. in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals)	Meat Hygiene Service	Animal	1924324	4568			4568
Sheep	Meat Hygiene Service	Animal	15874884	109187			109187
Goats	Meat Hygiene Service	Animal	6745	1			1
Pigs	Meat Hygiene Service	Animal	7955197	39			39
Solipeds, domestic	Meat Hygiene Service	Animal	85025	15			15

Footnote

E. multilocularis is believed to be absent from the UK

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/or infection in the country

Toxoplasmosis is only notifiable in humans in Scotland. In the rest of UK the human cases relate to voluntary laboratory reporting. In animals in UK toxoplasmosis is not notifiable or reportable. In animals surveillance relates to examination of samples received for diagnostic reasons at government veterinary laboratories. In Northern Ireland in animals at present, Toxoplasmosis appears to be endemic in the Northern Ireland sheep population, and the situation is similar in the rest of the UK. The DARDNI Veterinary Sciences Division records and relates to the cases submitted for diagnostic purposes through their laboratories. They report that in 2004, 30% of all samples submitted as a result of ovine abortion were due to toxoplasma infection. Isolates from private laboratories are not reported. The situation is similar in the rest of UK where 328 incidents of abortion in sheep were recorded in 2004 at government or agent laboratories.

National evaluation of the recent situation, the trends and sources of infection

The number of laboratory reports recorded in humans in the UK was 115, and there is no obvious trend. Toxoplasmosis remains the second most common cause of abortion in sheep when a diagnosis has been confirmed with 246 incidents recorded in 2005 in diagnostic samples from sheep in GB.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

The disease may be acquired through the consumption of undercooked infected meat, or food contaminated with cat faeces, or from handling contaminated soil or cat litter trays. A vaccine is available for sheep but not for humans.

2.10.2. Toxoplasma in animals

2.11. RABIES

2.11.1. General evaluation of the national situation

A. Rabies General evaluation

History of the disease and/or infection in the country

No cases of rabies in terrestrial animals were confirmed in the United Kingdom during 2005 and the country is recognised as having rabies free status by the O.I.E.
Human rabies is extremely rare in the UK. In the UK the last human death from classical rabies occurred in 1902 and the last case of indigenous terrestial rabies in an animal was in 1922. In 2005 one case was reported. The Patient had suffered a dog bite whilst on holiday in Goa.

National evaluation of the recent situation, the trends and sources of infection

No cases of human rabies were recorded in 2005.
No cases of rabies in terrestrial animals were confirmed in the United Kingdom during 2005.
The VLA has a long-standing programme of scanning (passive) surveillance for EBLVs in bats. This programme involves testing dead bats usually submitted by bat workers. Between 1987 and December 2005, the VLA tested 5,838 bats for lyssavirus and in that time, only four cases tested positive for live EBLV. Two of those cases were from bats in Lancashire, the others were from Sussex and Surrey.
Following the death of the Scottish bat handler in 2002, programmes of targeted (active)surveillance in England and Scotland were begun. This work involves taking samples of both blood and saliva from live bats in their roosts for laboratory analysis to check for the presence of live virus or antibodies to EBLV. The aim of the programmes is to assess the prevalence of EBLV type 1 and EBVL type 2 in England and Scotland. On 21 May 2005, Defra released preliminary results from the first year of a three year longitudinal study into the prevalence of bat variants of rabies from 2004 work in England.
This indicated a prevalence of antibodies to EBLV 2 in Daubenton's bats of about 4.2%. A single serotine bat in southern England was also found to have antibodies to EBLV 1. Full results of the study will be available in 2007.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

European Bat Lyssavirus (EBLVs) are related to the classical rabies virus. They have been known to infect not only the primary hosts (insectivorous bats) but on very rare occasions other animal hosts and humans. EBLV 1 and EBLV 2 have been identified in 12 bats species,
with over 90% of EBLV 1 identified in serotine bats, with Myotis species (including Daubenton's) associated with EBLV 2. EBLV 2 is found mainly in the UK. EBLVs are normally only transmitted
by the bite of an infected bat. There is no risk to humans if bats are not approached or handled by them. Bats are a protected species and must not be deliberately disturbed, captured or killed, or their roosts damaged or destroyed.

Recent actions taken to control the zoonoses

Although free of classical rabies for many decades there is still concern about the disease being reintroduced into the UK by imported animals. In December a draft rabies contingency plans was published for consultation.

A targeted surveillance programme in a small number of bats and bat roosts was conducted in 2003 to try and establish the prevalence of EBLVs in the bat population in England. This mirrored the targeted surveillance carried out in Scotland. The results showed a low level of antibodies in Daubenton bats in some areas of England and Scotland. In order to investigate the incidence further, a three year longitudinal study commenced in England in 2004 and another study is in progress in Scotland. The full results of the longer term study will not become available until 2007.

2.11.2. Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Sampling strategy

Rabies is compulsorily notifiable if the animal's clinical appearance is such that rabies is considered as a possible cause of the animal's condition.

Case definition

Rabies is confirmed if serological or histological tests or virus isolation reveals the presence of the rabies virus in the animal's tissues.

Diagnostic/analytical methods used

Other: A number of tests may be used FAT, Mouse innoculation test, histology, PCR

Vaccination policy

Vaccination is now permitted in the United Kingdom in accordance with the Pet Travel Scheme, those animals being exported, and those undergoing quarantine.

Results of the investigation

No cases of rabies were confirmed in dogs in 2005.

National evaluation of the recent situation, the trends and sources of infection

No cases of rabies in terrestrial animals were confirmed in the United Kingdom during 2005 and the country is recognised as having rabies free status by the O.I.E.
Although free of classical rabies for many decades there is still concern about the disease being reintroduced into the UK by imported animals.

Table Rabies in animals

	Source of information	Sampling unit	Units tested	Total units positive for Lyssavirus (rabies)	unspecified lyssavirus
Bats					
wild (1)	NRL	A	28	0	
Foxes					
wild (2)	NRL	A	1	0	

(1) : Investigations into incidents where there was human contact
(2) : Investigation into incident where there was human contact

Footnote

NRL is National Reference Laboratory. A is Animal

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ESCHERICHIA COLI, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

A. E. coli general evaluation

National evaluation of the recent situation, the trends and sources of infection

A survey was carried out in 2003 on a statically based sample of cattle, sheep and pigs arriving for slaughter at abattoirs in GB to determine the prevalence of foodborne pathogens in faecal samples (see report for 2003). Isolates of commensal E.coli were used from this survey for studies of antimicrobial resistance and these results were reported in 2004.
No similar survey has since been carried out, but a number of isolates resulting from submission of diagnostic samples have been tested for antimicrobial resistance in 2005 and the results are presented in the tables.

3.1.2. Antimicrobial resistance in Escherichia coli, non-pathogenic isolates

A. Antimicrobial resistance of E. coli in animal - All animals - Monitoring

Sampling strategy used in monitoring

Frequency of the sampling

The results given for E. coli relate to E. coli isolates from all sources and for cattle this includes isolates from milk as well as from faeces and other sites.

Results of the investigation

No resistance was detected to ceftiofur in isolates from pigs, chickens or turkeys. Resistance to enrofloxacin was only detected in E. coli isolates from pigs; no resistance was detected to enrofloxacin in E. coli isolates from cattle, chickens, turkeys or sheep.

Table Antimicrobial susceptibility testing of E. coli in animals

n = Number of resistant isolates

	E. coli									
	Cattle (bovine animals)		**Pigs**		**Sheep**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	yes		yes		yes		yes		yes	
Number of isolates available in the laboratory	3106		263		371		64		17	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Tetracyclines	3106	1739	263	210	371	145	64	36	17	11
Amphenicols										
Florfenicol					6	0				
Cephalosporins										
Cefalexin					95	1				
Ceftiofur			125	0	6	0	47	0	13	0
Fluoroquinolones										
Enrofloxacin	3106	0	263	13	371	0	64	0	17	0
Aminoglycosides										
Streptomycin	97	79								
Neomycin	3106	901	263	34	371	33	64	3	17	1
Trimethoprim + sulfonamides	3106	870	263	137	56	15	64	16	17	6
Penicillins										
Ampicillin	3106	1646	263	129	104	28	64	26	17	5
Resistant to >4 antimicrobials		902		114		44		8		0

Footnote

Isolates from England Wales. Mainly from diagnostic samples.

Table Breakpoints used for antimicrobial susceptibility testing of E. coli in Animals

Test Method Used

Disc diffusion
Agar dilution
Broth dilution
E-test

Standards used for testing

VLA_historicl_standards_based_on_British_Society_ for_Antimicrobial_Chenotherapy_standard_method

Escherichia coli, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ml)			Range tested concentration (microg/ml)		disk content	breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines	VLA						10	13		13
Amphenicols										
Chloramphenicol	VLA						10	13		13
Florfenicol										
Fluoroquinolones										
Ciprofloxacin										
Enrofloxacin	VLA						5	13		13
Quinolones										
Nalidixic acid	VLA						30	13		13
Trimethoprim										
Sulfonamides										
Sulfonamide	VLA						300	13		13
Aminoglycosides										
Streptomycin	V:A						10	13		13
Gentamicin	VLA						10	13		13
Neomycin	VLA						10	13		13
Kanamycin										
Trimethoprim + sulfonamides	VLA						25	13		13
Cephalosporins										
Cefalexin	VLA						30	13		13
Ceftiofur	VLA						30	13		13
3rd generation cephalosporins										
Penicillins										
Ampicillin	VLA						10	13		13

4. FOODBORNE OUTBREAKS

Foodborne outbreaks are incidences of two or more human cases of the same disease or infection where the cases are linked or are probably linked to the same food source. Situation, in which the observed human cases exceed the expected number of cases and where a same food source is suspected, is also indicative of a foodborne outbreak.

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of foodborne outbreaks

Health Protection Agency CDSC Colindale, Health Protection Scotland, and Health Protection Agency CDSC Northern Ireland receive preliminary reports of general outbreaks of Infectious Intestinal Disease (IID) from laboratories, health authorities or boards and local authority environmental health departments. Standardised questionnaires are then sent to the appropriate health authority/board in order to collect a minimum dataset on each outbreak. The investigating consultant is asked to complete the questionnaire when the outbreak investigation is complete. The completed questionnaires are returned to the national surveillance centre and the data entered onto a database. The following data are collected on the questionnaires:

· Health authority/board
· Date of outbreak
· Place of outbreak (hospital, restaurant, school, community etc.)
· Pathogen
· Mode of transmission (Foodborne, person to person, mixed, other)
· For foodborne outbreaks
· Food
· Evidence (microbiological, epidemiological)
· Numbers of cases, admitted to hospital, deaths

Surveillance of general outbreaks of IID provides information on the specific risk factors associated with different pathogens and also trends in the importance of these factors. However the completeness of the surveillance data is mainly dependent on the sensitivity of detecting outbreaks at local level. The ease of identification of outbreaks is associated with the same factors that affect laboratory report surveillance.

From time to time additional data are collected or specific surveillance studies set up, either nationally or localised, to provide information on certain aspects of a zoonosis.

National evaluation of the reported outbreaks in the country:

Trends in numbers of outbreaks and numbers of human cases involved

The full analysis of outbreak data are often not completed until some time after the outbreak has finished. A summary of the outbreaks in the UK is given in table 12. The most common causative agent identified in the outbreaks was Salmonella species.

Relevance of the different causative agents, food categories and the agent/food category combinations

A full evaluation is not yet available.

Table 12. Foodborne outbreaks in humans

Causative agent	General outbreak	Family outbreak	Total Number in persons			Source			Type of evidence	Location of exposure	Contributing factors
			ill	died	in hospital		Suspected	Confirmed			
1	2	3	4	5	6	7			8	9	10
Campylobacter, thermophilic	yes		13	0	0		yes			residential	
Campylobacter, thermophilic	yes		5	0	1					restaurant	
Campylobacter, thermophilic	yes		3	0	1					restaurant	
Campylobacter, thermophilic	yes		40	0	0	chicken liver parfait/cumberland sausage	yes		descriptive	other	
Campylobacter, thermophilic	yes		86	0	1	chicken liver pate			epidimiological	caterers	inadequate heat treatment and cross-contamination
Clostridium	yes		36			chicken curry		yes	micro-biological	hall	
Clostridium	yes		35	1	0	roast beef	yes		descriptive	residential	
Clostridium	yes		9	0	0					restaurant	
Clostridium	yes		43			fillet beef and bread	yes		descriptive	private house	
Clostridium	yes		17	0	0	roast beef			descriptive	school	inadequate heat treatment, storage too long and too warm
Escherichia coli, pathogenic	yes		6	0	2					hall	
Escherichia coli, pathogenic	yes		2	0	1					restaurant	
Food borne viruses	yes		13	0	0					club centre	
Unknown	yes		6							restaurant	
Unknown	yes		5							restaurant	
Unknown	yes		20							other	
Campylobacter, thermophilic	yes		8	0	0					restaurant	
Campylobacter, thermophilic	yes		3	0	0	chicken liver pate				restaurant	
Clostridium	yes		70			lamb biryani	yes	yes	micro-biological	hall	
Escherichia coli, pathogenic	yes		4	0	2					school	
Clostridium	yes		17			beef joint	yes		descriptive	residential	
Clostridium	yes		13	0	0					residential	
Escherichia coli, pathogenic	yes		2	0	0					private house	
Food borne viruses	yes		17	0	1					club centre	

Food borne viruses	yes		54	0	1					restaurant	inadequate heat treatment and cross-contamination
Unknown	yes		5							hall	
Unknown	yes		28			flimmary (sweet)		descriptive		hotel	
Campylobacter, thermophilic	yes		4	0	0	chicken liver tikka	yes	descriptive		restaurant	
Clostridium	yes		24	0	0					residential	
Food borne viruses	yes		43	0	0	3 bean salad	yes	descriptive		private house	
Unknown	yes		6							restaurant	
Salmonella - S. Enteritidis	yes		20	0	0	birthday cake and salted salmon		microbiological and epidimiological		ship	cross-sontamination, storage too long, too warm, possible infected food handler
Salmonella - S. Enteritidis	yes		1	0	1	eggs		microbiological		various	inadequate heat treatment
Salmonella - S. Saintpaul	yes		5	0	0					community	
Salmonella - S. Virchow	yes		9							restaurant	
Salmonella - S. Virchow	yes		8	0	7	chicken	yes	descriptive		hospital	
Salmonella - S. Typhimurium	yes		9	1	3					shop retailer	
Salmonella - S. Typhimurium	yes		71	0	0	iceberg lettuce	yes	descriptive		national	
Salmonella - S. Typhimurium	yes		65	0	3	bang bang chicken, satay chicken and mussels in black bean sauce				restaurant	
Salmonella - S. Typhimurium	yes		3							restaurant	
Salmonella - S. Typhimurium	yes		2	0	0					restaurant	
Salmonella - S. Typhimurium	yes		15	0	3	donner kebab and chicken kebab		descriptive		restaurant	inadequate heat treatment, cross-contamination
Toxins - Scrombotoxin	yes		2			tuna chunks in brine			yes	shop retailer	
Toxins - Scrombotoxin	yes		2			fresh tuna		microbiological	yes	hotel	
Toxins - Scrombotoxin	yes		3			tuna		microbiological	yes	shop retailer	
Toxins - Scrombotoxin	yes		2			tuna	yes	descriptive		restaurant	
Salmonella - S. Enteritidis - PT 25	yes		8	0	0					restaurant	
Salmonella - S. Enteritidis - PT 25	yes		2	0	0					restaurant	
Salmonella - S. Enteritidis - PT 21	yes		6	0	0					shop retailer	
Salmonella - S. Enteritidis - PT 21	yes		8	0	0					community	
Salmonella - S. Enteritidis - PT 14b	yes		12	0	0	sesame prawn toast	yes		microbiological	mobile retailer	
Salmonella - S. Enteritidis - PT 6	yes		5	0	0	salad			yes	microbiological	restaurant	

Salmonella - S. Enteritidis - PT 6	yes		18	0	3	egg fried rice		yes	descriptive	restaurant
Salmonella - S. Enteritidis - PT 6	yes		10	0	3					restaurant
Salmonella - S. Enteritidis - PT 6	yes		3	0	0					restaurant
Salmonella - S. Enteritidis - PT 6	yes		5	0	1					other
Salmonella - S. Enteritidis - PT 6	yes		15	0	0					restaurant
Salmonella - S. Enteritidis - PT 4	yes		4	0	0					restaurant
Salmonella - S. Enteritidis - PT 4	yes		2	0	0					hotel
Salmonella - S. Enteritidis - PT 4	yes		10	1	2					communities
Salmonella - S. Enteritidis - PT 4	yes		4	0	0					restaurant
Salmonella - S. Enteritidis - PT 4	yes		5	0	1					restaurant
Salmonella - S. Enteritidis - PT 4	yes		11	0	0	cake	yes		descriptive	other
Salmonella - S. Enteritidis - PT 4	yes		20	0	3	egg fried rice	yes		descriptive	restaurant
Salmonella - S. Enteritidis - PT 4	yes		9	0	0	chinese banquet	yes		descriptive	restaurant
Salmonella - S. Enteritidis - PT 1	yes		195	0	8	various		yes	micro-biological	restaurant
Salmonella - S. Enteritidis - PT 1	yes		24			tiramisu	yes		descriptive	restaurant
Salmonella - S. Enteritidis - PT 1	yes		5	0	0	chicken	yes		descriptive	restaurant