European Food Safety Authority

ZOONOSES MONITORING

United Kingdom

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

including information on foodborne outbreaks, antimicrobial resistance in zoonotic and indicator bacteria and some pathogenic microbiological agents

IN 2015

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/99/ EC*. 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 2015.

The information covers the occurrence of these diseases and agents in animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and indicator 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 Union 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 European Union 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 European Union Summary Reports on zoonoses and antimicrobial resistance that are published each year by EFSA.

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* 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 DISEASE STATUS

1.1 TUBERCULOSIS, MYCOBACTERIAL DISEASES

1.1.1 General evaluation of the national situation

1.1.1.1 Mycobacterium tuberculosis complex (MTC) - general evaluation

History of the disease and/or infection in the country

Scanning surveillance for TB is undertaken in domesticated animals, and in some wild animals slaughtered for human consumption. This is mainly by post-mortem inspection of animals at licensed abattoirs, private laboratories and APHA regional laboratories (AFBI in NI), with bacteriological culture of suspected clinical cases. In England and Wales, the following situations are notifiable: suspicion of TB in a wild, farmed or park deer carcase and the suspicion of TB in the carcase of a farmed or pet mammal (gross TB lesions). The identification of M. bovis by the laboratory examination of a sample taken from any mammal (except man) or from the carcase, products or surroundings of any such mammal is also notifiable. Regulations providing statutory compensation to keepers of TB affected camelids slaughtered because of TB came into effect in England in October 2014. In summer 2016, Defra will be consulting on formal proposals for a statutory TB compensation scheme for all farmed non-bovines species in England. In Wales, the Tuberculosis (Wales) Order 2011 provides APHA with the powers needed to deal effectively and quickly with incidents of TB in camelids, goats and deer, using a similar approach to that used when TB is suspected in bovines. This Order also provides for statutory compensation for animals of these species that are slaughtered as TB reactors. A new TB testing regime for South American camelids, such as alpacas and llamas, was introduced in England, Scotland and Wales in 2015. This entails mandatory skin and blood (antibody) parallel testing in skin test negative animals in holdings where M. bovis infection has been confirmed, as well as animals traced from infected herds. Skin and antibody testing of camelid herds with epidemiological links to a confirmed TB incident is also undertaken. A voluntary antibody testing service is available at APHA and a private laboratory for owners of unrestricted camelid herds who wish to TB test their animals privately (e.g. before or after movement between premises, additional pre-export testing, etc.). There is no compulsory routine tuberculin testing for the approximately 30,000 farmed and 25,000 park deer kept in Great Britain. Any tuberculin testing is limited to deer placed under TB restrictions, mainly 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. In Northern Ireland , disease confirmation in a non-bovine species is considered in relation to the risk to the bovine population, and neither vaccination nor treatment of non-bovine animals is permitted. Non-bovine domestic animals are not considered significant in the epidemiology within NI. The principle legislation dealing with TB in deer is the Tuberculosis Control Order (Northern Ireland) 1999. Under this legislation, suspicion of tuberculosis in deer is notifiable. Under this legislation, the keeper of a deer must inform the Divisional Veterinary Officer if the deer is affected with TB or suspected of being affected. A veterinary surgeon who identifies or examines an affected deer or a deer suspected of being affected must also inform the Divisional Veterinary Officer. No routine live animal testing is carried out but meat inspection in deer slaughterhouses is carried out by DAERA Veterinary Service Animal Health Group.

History of the disease and/or infection in the country

The UK is not officially free (OTF) from TB, although the majority of cattle herds in the UK are OTF. There are marked regional variations in prevalence of the disease. Northern Ireland: The control of bovine TB in cattle in Northern Ireland commenced in the 1920s. 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. From 1996, there was evidence of an increase in disease until 2003 (peak incidence occurred during the spring of 2003: herd incidence = 10.2%; animal incidence = 0.99%.The herd incidence of TB had remained relatively level over 2007-2010 although there was sustained rise during 2011-2012 peaking at 7.46% in October 2012. A reasonably steady decline was then observed for annual TB herd incidence although it remained approximately level from June 2014 to December 2014 (6.03% at December 2014). Annual herd incidence increased during the 1st nine months of 2015, but remained approximately level from October 2015 (7.15% at December 2015).Prior to 2014, annual animal incidence reduced steadily from October 2012. It remained relatively stable during 2014 prior to an increasing trend from October (0.55% in December 2014). Annual animal incidence increased during the 1st nine months of 2015, but remained approximately level from October 2015 (0.661% at December 2015).

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

Great Britain: 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 to be expected. 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, mainly to prevent excessive population growth and damage to crops and woodland. Statutory submissions of deer carcasses 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. Stalkers and deer managers may receive training in carcass inspection and have a statutory obligation to report suspicion of disease to the local APHA office. A field survey of TB prevalence in wild deer in the South-west Peninsula and the Cotswolds (England) in 2006 indicated M. bovis infection was present at a very low prevalence (less than 1%, except in one area where it was present at 3.8% in fallow deer). In the Cotswolds high prevalences were found in two of the three areas sampled (15.9% and 8.1%), particularly in fallow deer (Dama dama). In all areas surveyed, fallow deer were the species most likely to have the highest prevalence of M. bovis infection. It was concluded that, under current conditions of low to moderate density and TB prevalence, the majority of infected wild deer populations in SW England and Wales are most likely to act as spill-over hosts of M. bovis and, unlike badgers, do not pose a significant risk to cattle. Northern Ireland: There are 3 species of wild or feral deer in Northern Ireland: Dama dama (fallow deer), Cervus nippon (sika deer) and Cervus elaphus (red deer). A proportion of the red deer are enclosed. A survey carried out in 1995, in which deer of the three species were sampled, demonstrated a prevalence of 5.8% (397 deer sampled). A later surveillance exercise carried out in 2009, in which fallow and sika deer were sampled, revealed a prevalence of 2% (146 deer sampled). However, the low number of deer in NI (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, feedingstuffs and foodstuffs to human cases (as a source of infection)

The risk of humans contracting TB in the UK from animals is very low due to the pasteurisation of milk, the cattle testing programme and meat inspection at slaughterhouses. Bovine TB is a recognised zoonosis and can cause human infection, however, in recent years, M. bovis has accounted for only approximately 0.5% of all culture-confirmed M. tuberculosis complex diagnoses in humans in the UK annually.

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

No cases have ever been reported in the UK of human M. bovis infection attributable to close contact with tuberculous deer, their carcasses or ingestion of deer meat.

Recent actions taken to control the zoonoses

Consolidated EU hygiene regulations require that raw milk sold for drinking must be from OTF herds. In England and Wales, when the OTF status of a dairy herd is suspended, the Animal and Plant Health Agency (APHA) 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 pasteurisation. The medical authorities are also informed when the OTF status of a cattle herd of any type is withdrawn. Fewer than 100 dairy cattle herds are registered to produce raw cows drinking milk in England and Wales and such herds have to be TB tested every year. Sales to the final consumer of raw cows drinking milk and cream have been banned in Scotland since 1983. The ban was extended in 2006 to include sheep, goats and buffaloes milk. In Northern Ireland, there are currently 3 producers of bovine raw drinking milk for human consumption. Through the approval process, they are fully aware that any loss of OTF status would require cessation of raw drinking milk sales. Dairies have routine access to the health status records of their supply herds through an APHIS related database and are automatically notified when reactors are disclosed. Health authorities are informed of individual cases when there is a significant risk to human health.

Recent actions taken to control the zoonoses

In GB, 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 comparative 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 remain under permanent restrictions until destocked. Test reactors are compulsorily slaughtered and compensation paid. Tuberculin testing is also carried out on any 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.If lesions suggestive of TB are found in farmed and park deer at routine slaughter an additional detailed inspection must be carried out. The following parts and lymph nodes must be examined in detail (if they have not been examined already): the udder (in females); the supramammary/ superficial inguinal nodes; and the prescapular nodes. The affected part(s) of the carcase or the whole carcase may be declared unfit for human consumption. If a TB lesion is in single part/organ and associated lymph nodes that part/organ and lymph nodes are declared unfit for human consumption. If there are localised TB lesions in more than one part/organ or if TB is generalised or if there are TB lesions accompanied by emaciation, the carcase, offal and blood are declared unfit for human consumption.In NI, BTB found in deer is notified to the local Divisional Veterinary Office through HQ. Where there is possible contact with cattle herds and a risk of spread exists, relevant action will be taken on the cattle herd as appropriate (movement restriction and testing).

Additional information

Under domestic TB legislation, the identification of suspect tuberculous lesions in the carcasses of domestic mammals other than cattle is notifiable to the Animal and Plant Health Agency/Veterinary Services Northern Ireland. Furthermore, the identification of M. bovis in clinical or pathological specimens taken from any mammal (except humans) must be reported to APHA/DAERA NI.

Additional information

TB in deer and in other non-bovine farmed species is notifiable to the Central Authority in England (Defra) under The Tuberculosis (Deer and Camelid) (England) Order 2014, in Wales (Welsh Government) under the Tuberculosis (Wales) Order 2011, in Scotland (Scottish Government) under The Tuberculosis in Specified Animals (Scotland) Order 2015 and in Northern Ireland under the Tuberculosis Control Order (Northern Ireland) 1999. Vaccination is not permitted.

Additional information

Under domestic TB legislation, the identification of suspect tuberculous lesions in the carcasses of domestic mammals other than cattle is notifiable to the Animal and Plant Health Agency/Veterinary Services Northern Ireland. Furthermore, the identification of M. bovis in clinical or pathological specimens taken from any mammal (except humans) must be reported to APHA/DAERANI.

1.1.2 Mycobacterium in animals

1.1.2.1 Mycobacterium tuberculosis complex (MTC) in animal - Cattle (bovine animals)

Status as officially free of bovine tuberculosis during the reporting year

The entire country free

The UK is not officially free (OTF) from TB, although the majority of cattle herds in the UK are OTF. There are marked regional variations in prevalence of the disease.

Free regions

Scotland was designated an OTF region of the UK in October 2009 (Commission Decision 2009/761/EC) in recognition of the very low and stable incidence of the disease. In order to protect this favourable status, a number of additional control measures are in place to reduce the risk of reintroducing the disease via movements of infected cattle into Scotland from other parts of the UK Isle of Man (since February 2016).

Additional information

The rest of the UK is not officially free from TB (OTF) under Directive 64/432/EEC due to the high and endemic incidence of the disease in large parts of the country. Nevertheless, the majority of individual cattle herds in the UK do have OTF status at any given time (93% of all herds in GB at the end of 2015). The overall aim of the governments current bovine TB strategy for England is to secure OTF status for the whole of the country by 2039. For more information see: www.gov.uk/government/publications/a-strategy-for-achieving-officially-bovine-tuberculosis-free-status-for-england As an interim goal, the UK government intends to apply to the European Commission in 2018 for the Low Risk Area of the North and East of England to be recognised as an OTF region (see below). The Welsh Government has had a comprehensive bTB Eradication Programme in place since 2008. For more information see: http://gov.wales/docs/drah/publications/120320-tb-strategic-framework-en.pdf

Monitoring system

Sampling strategy

The TB testing programme applied in the UK follows the principles of Council Directives 64/432/EEC, 77/391/EEC and 78/52/EEC.

Frequency of the sampling

Great Britain (England, Wales and Scotland): Since 2013, for bTB epidemiological, surveillance and eradication purposes, England has been divided into a Low Risk Area (LRA comprising 41% of cattle herds in England) and a High Risk Area (HRA 45% of herds), separated by a buffer zone known as the Edge Area (14% of herds). The LRA comprises the majority of counties in the North and East of England, where Mycobacterium bovis (M. bovis) infection occurs only sporadically in isolated cattle herds and is not considered endemic in wildlife (badgers). Most herds in the LRA are routinely tested for TB every four years. The HRA is the annual testing area of England comprising the South West, West Midlands and part of East Sussex, in which M. bovis infection is endemic in cattle herds and in badgers. The Edge Area is a region of low to moderate herd incidence situated between the LRA and HRA, which is at risk of spread of endemic bTB from the HRA and where cattle herds are TB tested with a frequency of 12 months in most cases (every six months otherwise). In Wales routine surveillance testing of herds for TB takes place every 12 months. Scotland takes advantage of the herd testing derogation afforded to OTF regions and approximately 45% of all cattle herds are exempt from routine TB testing on a risk basis. The remaining 55% of herds in Scotland are tested every four years. Additionally, targeted testing takes place in specific herds as necessary on an epidemiological/risk basis. For more information see: https://www.gov.uk/guidance/bovine-tb-testing-intervals-2016 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.

Methods of sampling (description of sampling techniques)

In the UK, the primary screening test for TB in cattle is the single intradermal comparative cervical tuberculin (SICCT) test, using avian and bovine purified protein derivative (PPD) tuberculins. The test technique and interpretation of its results is as laid down in Annex B to Directive 64/432/EEC. In order to increase the diagnostic sensitivity of the skin test, A more severe interpretation of results is applied in the majority of herds sustaining a TB breakdown (OTF status withdrawn or suspended). Where inconclusive test reactors (IRs) are disclosed, those animals are required to be isolated and retested once after 60 days. Any IRs that do not resolve at this retest are classed as reactors and removed to slaughter. The programme of regular tuberculin herd testing is complemented 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 if no alternative diagnosis is made. All TB test reactors and some in-contact animals are compulsorily removed for slaughter. The majority of those animals go to a small number of slaughterhouses contracted by the government for TB reactor work, where the slaughtered are subject to post-mortem meat inspection by inspectors and official veterinarians of the Food Standards Agency. Lymph nodes or lesions of TB are collected for bacteriological culture from a representative number of reactors in each TB breakdown herd. The affected organ or part of the carcase (or the whole carcase if more than one organ is affected) are condemned and do not enter the food chain. At least one M. bovis isolate from each herd with culture-confirmed infection is genotyped to inform epidemiological investigations into the spread and origin of TB breakdowns. Strain typing of M. bovis isolates is by a combination of spacer oligonucleotide typing (spoligotyping) and analysis of variable number tandem repeats (VNTR). Great Britain - England, Wales and Scotland: Deployment of the ancillary interferon-gamma (IFN-gamma) blood test (Bovigam) continued and was further extended in 2015, to enhance the sensitivity of the cattle testing programme in TB breakdown herds with OTF status withdrawn. Northern Ireland: Use of the IFN test continued during 2015. It is mainly used as a voluntary ancillary test to the SICCT in herds where there are significant numbers of intradermal reactors and/or infection is confirmed and its use allows earlier removal of diseased animals than the SICCT alone.

Case definition

Situations where OTF herd status is suspended (OTFS): 1) Where at least one animal in the herd has a positive result to the tuberculin skin test (a reactor); 2) Where a test reveals IRs only, in a herd that had OTF status withdrawn within the previous three years. In NI, OTF status is suspended regardless of the herd history, but the derogation is applied at status reason level. 3) Following the discovery of a lesion suggestive of bovine TB in a carcase from an OTF herd during routine slaughterhouse surveillance (slaughterhouse cases in GB and lesions at routine slaughter in NI); 4) Where a tuberculin test becomes overdue; 5) In suspected clinical cases in GB (very rare); and 6) Where there are no overriding epidemiological reasons to apply OTFW status. Situations where OTF herd status is withdrawn (OTFW): 1) Herds with one or more skin test reactors with visible lesions of TB at PM examination or at least one animal with an M. bovis-positive culture result. 2) In NI, on epidemiological grounds where disease has not been confirmed. Furthermore in NI it is an obligation to apply OTW status, without the need for any laboratory/PME confirmatory indication where more than five reactors are identified either at a single test or cumulatively during the course of a breakdown. OTW status is also applied where the inter herd test interval reaches a maximum of fifteen months in NI. 3) From January 2016, all new TB breakdowns in Wales have been given OTFW status by default. OTFS status is only applied following Veterinary Risk Assessment based on epidemiological evidence to suggest it is warranted

Vaccination policy

Vaccination of bovines and other domestic animals against TB is not carried out in the UK and is forbidden by the domestic animal health legislation, in line with Directive 78/52/EEC. There are different approaches in England, Wales and NI for the vaccination of badgers against TB using injectable Badger BCG. However, following problems with the production and supply of the vaccine from Denmark, if these badger vaccination projects were to continue, the only alternative was to use the human BCG vaccine. Due to an ongoing global shortage of the BCG vaccine for use in humans, Defra and the Welsh Government decided at the end of 2015 to cease the sourcing of the vaccine for use in badgers until the production situation resolves. This means that all badger TB vaccination projects in England and Wales have been suspended in 2016 until further notice. England: In 2015, Defra provided grants to meet some of the costs of six badger vaccination projects covering 0.6% of the land in the Edge Area, where badgers are thought to have lower prevalence of infection and where it may be feasible to create buffers of vaccinated, TB free badger social groups to slow down the geographic spread of the disease. Wales: In May 2012 the Welsh Government began to vaccinate badgers in the so-called Intensive Action Area (IAA) of West Wales (covering approximately 288km2), initially for five consecutive years. Between 1100 and 1500 badgers have been vaccinated annually in the first four years of the IAA project. The annual reports are available at: http://gov.wales/topics/environmentcountryside/ahw/disease/bovinetuberculosis/intensive-action-area/badger-vaccination-iaa/?lang=en A Badger Vaccination Grant was also established in Wales from October 2013 to provide farmers, landowners, and other organisations with the opportunity to apply for financial support (up to 50% of the eligible costs of vaccination) towards badger vaccination over five years.

Other preventive measures than vaccination in place

In England, the government allows farmer/landowner-led licensed badger culling and badger vaccination, in line with guidance issued to Natural England (the licensing body) and publicly available at: www.gov.uk/government/publications/guidance-to-natural-england-preventing-spread-of-bovine-tb Following two successful pilots that began in West Somerset and West Gloucester in the summer of 2013, a third badger control area was licensed in 2015 in Dorset. The governments aim is to substantially increase in the coming years the area of England under badger population controls from approximately 2% of the High Risk Area in 2015 to 10% in 2016 and 20-25% by 2018. Defra will carry out a badger TB survey in the Edge Area in 2016/17 and support ongoing surveillance in other wildlife (e.g. tests on suspected TB in wild deer). As part of the Welsh Governments bTB eradication programme, badgers found dead in Wales can be submitted for post-mortem examination and culture in order to estimate the prevalence and distribution of M. bovis infection. For more information see: http://gov.wales/topics/environmentcountryside/ahw/disease/bovinetuberculosis/bovinetberadication/badgers-and-tb/badger-found-dead-survey/?lang=en Voluntary on-farm biosecurity measures to limit direct and indirect contact between cattle and badgers.

Control program/mechanisms

The control program/strategies in place

Surveillance for early detection of infected cattle herds: The cornerstone of the TB control programme in the UK is the mandatory comparative intradermal tuberculin testing of cattle herds at regular intervals according to the disease incidence in a defined region: six-monthly in parts of the Edge Area of England; every 12 months in NI, the remainder of the Edge Area and in the High Risk of England; and every four years (by default) in the counties of the LRA of the North and East of England. A small proportion (<10%) of the herds in the LRA are tested more frequently In Wales, herds in the Intensive Action Area (IAA) are subject to six-monthly testing; all other herds are subject to annual TB testing. Ad hoc targeted/more frequent testing of individual at-risk or suspect herds or animals Slaughterhouse TB surveillance of cattle carcases, with mandatory notification and back-tracing in cattle and other red meat species. Legal obligation to notify suspected gross lesions of TB in non-bovine domestic species and the isolation of M. bovis from tissues of any mammal. Management of infected herds (breakdowns) to quickly eliminate M. bovis, minimise risk of spreading infection to other herds and restore OTF herd status: Movement restrictions on infected herds; Isolation and rapid removal of suspected infected animals, with statutory compensation; Increased sensitivity and frequency of herd testing to regain OTF status, using parallel testing where necessary; Cleansing and disinfection of areas used by TB reactor cattle; Enhanced surveillance in surrounding herds; Tracing for source and spread; Occasional partial or complete slaughter of herds; Testing of other co-located susceptible species; Epidemiological enquiries; Notification of breakdowns to local public and environmental health (food) authorities. Other preventive/support measures to reduce the risk of spreading bTB. Registration, identification and movement reporting of cattle in GB Statutory pre-movement skin testing of cattle over 42 days of age from herds that are subject to annual (or more frequent) TB testing in England and Wales, excepting moves directly to slaughter or to certain licensed cattle finishing units; Statutory post-movement skin testing of cattle entering the LRA of England to live, from the rest of England or from Wales. Elsewhere voluntary post-movement testing of cattle is encouraged. Approved Finishing Units for fattening of negative testing cattle from TB restricted herds; Farmer advice and guidance; Provision of information on bTB, including online mapping tools and regular publication of bTB surveillance and epidemiology reports.; Sanctions for failure to comply with the rules, including herd movement restrictions, basic farm payment cuts, reduced TB reactor compensation payments, etc. Enforcement action is taken by the Local Authorities; Voluntary risk-based trading of cattle; Public health protection measures (see below). In Northern Ireland, routine tuberculin skin testing, compulsory purchase and removal of any reactors, movement restrictions and routine carcase inspection of human consumption animals are the mainstays of the TB control programme. All cattle herds throughout Northern Ireland are tested at least annually with over 25% of herd subject to more frequent testing. Failure to test as required results in removal of OTF status. There is no pre-movement testing, except for export if over 42 days of age or where an individual animal has not been tested within 15 months. In Northern Ireland, a herd loses OTF status when lesions typical of TB are disclosed at slaughter or any laboratory test is positive. It will also lose OTF status in any case where more than five skin reactors are disclosed and otherwise where considered epidemiologically necessary.

Recent actions taken to control the zoonoses

Regular TB testing programme of cattle herds, with removal of all positive animals. Almost universal pasteurisation of all the milk supply destined for human consumption. Sales of raw milk are banned in Scotland. There are fewer than 100 producer-retailers of raw cows milk approved by the FSA in England and Wales. Such herds must retain OTF status and undergo annual TB testing with negative results. Milk from individual TB test reactor cows in TB breakdown herds cannot be used for human consumption according to Regulation (EC) No. 853/2004 of the European Parliament. Milk from negative-testing cows in dairy herds that have lost their OTF status must be pasteurised before it is used for human consumption. Ante- and post-mortem inspection of cattle in slaughterhouses by inspectors of the Food Standards Agency. Written advice on public health risks from M. bovis for owners of TB-infected herds and other domestic animals. Notification to the local teams of the relevant public health protection agencies of all cattle herds that have their OTF status withdrawn due to a TB breakdown, plus any cases of M. bovis infection confirmed in other domestic species. Regular liaison/coordination meetings between animal health, public health protection and food standards competent authorities in the UK, both at a national and local level.

Measures in case of the positive findings or single cases

In Great Britain, see above. In Northern Ireland, reactors are individually valued and compulsorily removed to one DARD contracted abattoir. Removed animals are subject to Veterinary Public Health Programme ante mortem examination and post mortem examination. Appropriate samples are taken for further laboratory examination, including histopathology, culture and VNTR typing. Movements from the herd, except directly to slaughter in NI, are immediately restricted. Movements into the herd may also be restricted, where considered epidemiologically necessary. A testing regime with an inter-test interval of about 60 days is instigated. Appropriate tracing forwards and backwards and lateral herd risk assessment is carried out with movement controls and testing applied as necessary. Cleansing and disinfection of premises is required. Restoration of OTF status is dependent on completion of the appropriate number of consecutive tests with negative results. Herds are retested after a four to six month interval once OTF status is regained and thereafter annually or more frequently if considered necessary. Where inconclusive reactors to tests are detected, the animal is required to be isolated and retested. If the herd has OTF status, the status is changed to OTF status suspended (OTS). The inconclusive reactors are retested once. If, at the retest, the inconclusive reactor is not negative the animal is declared a reactor and is compulsorily removed to slaughter. Where lesions of TB are suspected at routine slaughter ,OTS is applied. Lesion material is submitted for laboratory examination. If TB is confirmed, the herd becomes OTW. If not, remaining negative to laboratory tests for TB, in the absence of an alternative diagnosis, remains OTS. Movements of cattle off affected premises are immediately restricted, except for animals directly slaughtered in Northern Ireland. OTF status is restored when the herd has undergone the required testing schedule and cleansing and disinfection. One clear herd test is required in the case of disease in OTS herds and two consecutive clear herd tests are required in the case of OTW herds. Where a herd is OTW, forward tracing and appropriate testing is carried out. Back-tracings of reactors are also undertaken, as appropriate. Back-traced herds are placed under movement restriction (OTS or OTW) until appropriate tests have been carried out. Any cattle on holdings adjoining an infected herd which are considered by the Veterinary Officer dealing with the breakdown to be at increased risk of TB infection are subject to an increased frequency of testing. Herds are retested after a four to six month interval once OTF status is regained and thereafter annually or more frequently if considered necessary.

Results of the investigation

For the latest set of comprehensive statistics on TB in cattle in England, Wales and Scotland please see: https://www.gov.uk/government/statistics/incidence-of-tuberculosis-tb-in-cattle-in-great-britain Northern Ireland: Approximately 24,539 herds were tuberculin tested during 2015 (approx. 1.66 million cattle) and 15,873 IFN- tests were carried out in 2015. There were 1,688 new TB herd breakdowns where a skin test reactor was detected in a herd where no reactor animal had been identified in previous 12 months. There was an increase of 2164 reactors, or 24.49% compared with 2014, and there was an increase of 291 breakdown herds or 20.83% compared to 2014.

Additional information

Managing the risk of infection from badgers (see previous sections): Voluntary privately funded local badger vaccination projects (England and Wales) and government-run badger vaccination projects (Wales). Privately-funded licensed badger culling projects in annual testing areas of England with high endemic incidence of TB in cattle. Voluntary adoption of on-farm biosecurity measures.

1.2 BRUCELLOSIS

1.2.1 General evaluation of the national situation

1.2.1.1 Brucella - general evaluation

History of the disease and/or infection in the country

Humans: In the UK cases of brucellosis in humans usually occur as a result of infection acquired outside the countries although historically in Northern Ireland infection had been recorded in those whose work may bring them into close contact with infected cattle. Animals: Great Britain - England, Wales, Scotland: all livestock in Great Britain are officially free of infection from Brucella abortus, Brucella melitensis, Brucella ovis and Brucella suis. All cattle herds within Great Britain achieved Officially Brucellosis Free (OBF) status for Brucella abortus on 1 October 1985 and Great Britain achieved regional freedom in 1996. Northern Ireland: Northern Ireland: Northern Ireland was granted Officially Free status for Brucella abortus on 6th October 2015 (Commission Implementing Decision (EU) 2015/1784). Northern Ireland was already officially free of Brucella melitensis, Brucella ovis and Brucella suis. Brucella melitensis, B. canis, B. ovis and B. suis have never been recorded in United Kingdom.

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

During the year 2015, there were no cases of brucellosis of cattle in Great Britain, which has retained its Officially Brucellosis Free Status. There were also no herds detected as infected with Brucella abortus in Northern Ireland during the year. Northern Ireland was granted Officially Free status for Brucella abortus on 6th October 2015 (Commission Implementing Decision (EU) 2015/1784). No sheep or goat herds were detected positive for Brucella mellitensis during the annual sheep and goat survey in 2015.

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

Cases of brucellosis in humans are usually recorded associated with infection acquired outside the UK. Historically in Northern Ireland cases of Brucella abortus were occasionally acquired when infection was transmitted by infected cattle.

Additional information

During 2015, a total of 1,137 dogs for export were tested for brucellosis; all were negative. Serology of 599 alpacas, 5 buffalo, 8 camels, 21 deer, 15 oryx and 4 Vicuna all for import/export requirements, yielded negative results.

1.2.2 Brucella in animals

1.2.2.1 B. abortus in animal - Cattle (bovine animals) - Control and eradication programmes - Northern Ireland

Monitoring system

Sampling strategy

For veterinary administrative purposes, the province is divided into 10 regions, each with a Divisional Veterinary Office. The regions are sub-divided into "patches", each managed by a veterinary officer (VO) and team of technical officers. A centralised animal health database (Animal and Public Health Information System or APHIS), incorporating an animal movement and test management system is used for all aspects of Brucellosis testing. The animal health database is used to administer between-herd movement of cattle, captured in real-time using a movement document system and with terminals located in markets and abattoirs. The animal movement and test management system facilitates management of herd-level and animal-level tests, with serological results recorded at animal level. Screening for Brucellosis comprises serological testing of eligible cattle, ELISA testing of bulk milk tank samples from dairy herds and sampling at slaughter of cattle. Monthly bulk milk sampling commenced in 2001 and all dairy herds were included in the screening programme within the following year. The requirement for pre-movement testing was introduced in December 2004 and abolished in September 2015. The Department of Agriculture and Rural Development for Northern Ireland (DARD) carries out a programme of blood testing of all herds containing breeding stock (and milk testing of all dairy herds). Routine brucellosis blood sampling was carried out on beef cattle herds in Northern Ireland on an annual basis until June 2015, when testing frequency was changed to a biennial basis. Dairy herds were routinely blood sampled on a biennial basis until November 2015, when the frequency of testing was decreased to once every five years. Monthly bulk milk ELISA testing continues. At present the Serum Agglutination Test is used in accordance with Annex C of Directive 64/432/EEC as a screening test for low risk tests with the Complement Fixation Test (CFT) and ELISA Test used for confirmation (if any SAT reading greater than or equal to 30 iu is detected at this test). Parallel testing with SAT and ELISA is carried out in all high risk tests: if any SAT results are greater than or equal to 30iu or any iELISA results are non negative, CFT testing may be carried out. Any animal giving an SAT test result of 30 iu or more or any CFT reading of <20 iu is classified as an inconclusive reactor and is required to be isolated and retested. A risk analysis is carried out and if significant risk factors exist, then an ELISA test is requested on subsequent tests. Derestriction of the animals movements within the country may occur if the iELISA and CFT results are negative and SAT remains less than 102 iu. Animals with SAT readings of 102 iu may be taken as reactors, as may animals with CFT readings of 20 iu. Those with iELISA positive results may be removed, again depending on significant risk factors. Abortions are required to be notified and a restriction notice is issued for these animals, prohibiting their movement off the premises and requiring them to be isolated. The animals are tested using SAT, CFT and ELISA tests until a negative test result at 21 days post-calving is obtained.

Frequency of the sampling

As described in monitoring system above.

Type of specimen taken

Blood, milk, vaginal swab, tissues/organ as appropriate.

Case definition

Culture and isolation of the organism.

Diagnostic/analytical methods used

Serology and culture.

Vaccination policy

Vaccination policy: Vaccination of animals is not allowed.

Measures in case of the positive findings or single cases

Herd restrictions are imposed once a reactor is identified. The reactor 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. Compensation is paid to a limit of 75% of the average market value subject to a ceiling based on market returns. When an animal is intended to be slaughtered, the amount of compensation is based on the market value of the animal. The market value is an amount agreed between the competent authority and the owner of the animal. Where agreement cannot be reached the owner has the option to nominate an independent valuer to value the animal. Where either the competent authority or the owner is dissatisfied with the determination of market value they may submit an appeal to an independent panel. 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. 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.

Notification system in place

Statutory notification of abortions is required under the Brucellosis Control Order (Northern Ireland) 2004 (as amended). The isolation of Brucella species in a laboratory is reportable under the Zoonoses Order (Northern Ireland) 1991.

Results of the investigation including the origin of the positive animals

In 2015, 20,806 herds were checked. In total, 0 herds were detected positive. Overall, 584,988 animals were tested individually and 0 animals were detected as positive. The annual herd incidence was 0.00% in December 2015 and the annual animal incidence was 0.000% in the same month compared to an annual herd incidence of 0.04% and an annual animal incidence of 0.001% for the same period in 2014. There have been no confirmed breakdowns since February 2012.

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

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. There was a fall in brucellosis incidence in Northern Ireland from its peak (annual herd incidence of 1.43%) at the start of 2002 to a low point in October 2005 (0.34%). Subsequently, there was a rise in herd incidence from this point, however a marked decrease in annual herd incidence occurred from the end of 2008 to the end of December 2012. The culture confirmed herd incidence for 2015 was 0.00%, and Northern Ireland was granted Officially Free status for Brucella abortus on 6th October 2015 (Commission Implementing Decision (EU) 2015/1784).

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 have occurred in the past associated with occupational contact with infected cattle.

1.2.2.2 B. abortus in animal - Cattle (bovine animals)

Status as officially free of bovine brucellosis during the reporting year

Free regions

Great Britain is officially free of infection from Brucella abortus. Northern Ireland was granted Officially Free status for Brucella abortus on 6th October 2015 (Commission Implementing Decision (EU) 2015/1784).

Monitoring system

Sampling strategy

Great Britain - England, Wales, Scotland: Brucellosis is a notifiable disease and there is a statutory surveillance programme for the disease in Great Britain. As in previous years, the principle surveillance system in 2015 was quarterly testing of bulk milk samples from dairy herds by the ELISA test, together with the requirement for notification and investigation of abortions or premature calvings and post import testing. Farmers in Great Britain are legally required to notify the Animal and Plant Health Agency (APHA) of any abortions or premature calvings that take place in their herd under Article 10 of the Brucellosis (England) Order 2000 and equivalent legislation in Wales and Scotland. This applies to both dairy and beef herds. Abortions and premature calvings 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 by culture. If a suspected Brucella organism has been cultured, it must be reported to the Competent Authority and sent for identification to the Brucella National Reference Laboratory under the requirements of the Zoonoses Order 1989.

Type of specimen taken

Blood, milk, placental material and swabs 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

Great Britain - 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 are tested by a serology indirect ELISA and complement fixation test. Herd restrictions which stop the movement of animals off the premises, except under the authority of a movement license, are imposed once a reactor is identified (on suspicion). The animal is required to be kept in isolation and slaughtered within 21 days. Other animals on the farm can be sent, under license, 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. 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 paid for reactors and contacts is in accordance with a table of values based on the current average market price for the type of animal. Whenever the Officially Brucellosis Free (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

In Great Britain, notification is required under the Brucellosis (England) Order 2000 and its equivalents in Wales and Scotland. The Zoonoses Order 1989 requires the isolation of Brucella species in any laboratory to be reported to the Competent Authority.

Results of the investigation

Great Britain - England, Wales, Scotland: During 2015, APHA Weybridge tested 37,847 bulk milk samples from 8,516 farms as part of the national surveillance programme. Routine monitoring of cattle abortions and premature calvings was carried out with 6,270 cases investigated during the year. Overall, there were no cases of brucellosis in cattle in Great Britain confirmed during 2015.

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

Great Britain - England, Wales, Scotland: All herds within Great Britain achieved Officially Brucellosis Free (OBF) status on 1 October 1985.

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

Great Britain - England, Wales, Scotland: As livestock in Great Britain 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.

1.2.2.3 B. melitensis in animal - Goats

Status as officially free of caprine brucellosis during the reporting year

The entire country free

The entire country is 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 and herds is checked each year in the Annual Sheep and Goat survey.

Frequency of the sampling

Annual sampling.

Type of specimen taken

Blood, organ/tissues as appropriate.

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

During the year 2015, surveillance for brucellosis was provided by the National Sheep and Goat Survey. 492 blood samples from 120 goat herds in Great Britain and 141 samples from 28 goat herds in Northern Ireland were tested, all with negative results. In addition, all investigations into goat abortions were negative on testing for brucellosis.

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

The 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)

There is no evidence of humans being infected with brucellosis asociated with goats in the UK. Brucella melitensis infection in man is acquired from outside the UK.

1.2.2.4 B. melitensis in animal - Sheep

Status as officially free of ovine brucellosis during the reporting year

The entire country free

The entire country is 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

A sample of flocks is checked each year in the Annual Sheep and Goat survey.

Frequency of the sampling

Annual survey.

Type of specimen taken

Blood, organ/tissues as appropriate.

Case definition

Isolation of the organism.

Diagnostic/analytical methods used

Microbiological techniques to confirm. Serology to monitor.

Vaccination policy

No vaccination is permitted.

Notification system in place

Brucella in sheep is a notifiable disease under national legislation. Isolation of the organism in a laboratory must also be reported to the Competent Authority under the Zoonoses Order 1989 and Zoonoses Order (Northern Ireland) 1991.

Results of the investigation

During 2015, surveillance for freedom from B. melitensis was provided for by the National Sheep and Goat Survey in addition to routine surveillance of samples submitted from cases of abortions. In the survey, total of 11,277 blood samples from 801 flocks were tested in Great Britain, all with negative results. In Northern Ireland, 4,155 animals in 255 flocks were tested, all with negative results. In addition, all investigations into sheep abortions were negative on testing for brucellosis.

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.

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 Salmonella in animals

2.1.1.1 Salmonella in animal - Ducks - unspecified

Monitoring system

Sampling strategy

Monitoring for Salmonella in duck breeding, fattening and commercial egg laying flocks is carried out on a voluntary basis by the food business operator.

Frequency of the sampling

Animals at farm

No statutory sampling carried out. Voluntary operator sampling according to food business operator's own protocol

Type of specimen taken

Animals at farm

Faeces samples, bootswabs, hatchery debris, cull birds, hatcher tray liners, organs at post mortem etc

Methods of sampling (description of sampling techniques)

Animals at farm

Voluntary samples usually sent by the operator to a private testing laboratory/ government testing laboratory to monitor Salmonella status of the flock or post mortem samples sent by private veterinarian for diagnostic purposes

Case definition

Animals at farm

Culture and isolation of Salmonella from samples taken from the animal/flock or associated with its environment. Reports of Salmonella isolates under the Zoonoses Order are classed as positive.

Vaccination policy

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

Control program/mechanisms

The control program/strategies in place

Operators are encouraged to monitor in the same way as done for Gallus gallus under Regulation (EC) No. 2160/2003, but there is no statutory national Salmonella control programme in the duck industry sector in the UK. All Salmonellae isolated must be reported to the Competent Authority under the requirements of national legislation. Advice on disease control measures is given and visits to the farm by Government officials may be made, particularly if the Salmonella is considered to be 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 ducks. Assistance is given to the public health authorities with on-farm investigations and epidemiological studies if there is a outbreak of salmonellosis in humans associated with the farm.An Industry Assurance Scheme, similar to those already in place for the broiler, turkey and layer chicken sectors has been developed by representatives of the UK duck industry and was published in 2011. The Duck Assurance Scheme is owned and administered by the British Poultry Council and is managed by an independently chaired Technical Advisory Committee. It covers all areas relating to quality and welfare in duck production: breeding, hatching, rearing, catching, transport, slaughter, free-range and table eggs, and includes guidance on control of Salmonella by means of biosecurity, farm hygiene and vaccination.

Measures in case of the positive findings or single cases

Advice is given on control of Salmonella and farm visits may be made by the veterinary and public health authorities. Restrictions may be placed on the premises under the Zoonoses Order.

Notification system in place

All isolations of Salmonella must be reported to the Competent Authority and a culture supplied to the National Reference Laboratory under the Zoonoses Order 1989 in Great Britain and the Zoonoses Order (Northern Ireland) 1991 in Northern Ireland. Units tested are not known because the laboratories do not report negative results unless sampling was part of an official control programme or survey.

Results of the investigation

Voluntary monitoring for Salmonella is carried out by a significant proportion of the duck industry, but because this is done on a voluntary basis, the number of submissions for Salmonella testing from UK duck flocks can vary from year to year. There were a total of 268 reports of Salmonella isolated from ducks in the GB in 2015. Salmonella Indiana was the most commonly isolated serovar (90). There were 2 isolations of Salmonella Typhimurium (DT8) and 4 isolations of S. Enteritidis .

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. S. Typhimurium DT8 has been associated with farmed ducks in the UK for many years, accounting for around 50% of all S. Typhimurium incidents in ducks but no DT8 was isolated in 2013. In 2010, an outbreak of Salmonella Typhimurium DT 8 in humans occurred in England and Northern Ireland, with 81 recorded cases and 5 patients hospitalised. Descriptive epidemiological investigation found a strong association with infection and consumption of duck eggs. This was the first known outbreak of salmonellosis linked to duck eggs in the UK since 1949 and highlighted the impact of a changing food source and market on the re-emergence of salmonellosis linked to duck eggs. (Noble, D.J, Lane, C., Little, C.L., Davies, R., de Pinna, E., Larkin, L., Morgan, D. (2011). Revival of an old problem: An increase of Salmonella enterica serovar Typhimurium Definitive Phage Type 8 Infections in 2010 in England and Northern Ireland linked to duck eggs. Epidemiology and Infection)

2.1.1.2 Salmonella in animal - Geese - unspecified

Monitoring system

Sampling strategy

Monitoring for Salmonella in geese is carried out on a voluntary basis by the food business operator. Reports of Salmonella in geese usually arise from samples sent by a private veterinarian for diagnostic purposes. There is no official National Control Programme for the control of Salmonella in the geese industry sectors. Government funded scanning surveillance programmes are delivered by the Animal and Plant Health Agency, Scotland's Rural College (SRUC) and the Agri-food and Biosciences Institute (AFBI). These programmes are built upon the subsidised diagnosis and disease investigation service offered to livestock farmers through their private veterinary surgeons.

Type of specimen taken

Animals at farm

Usually faeces or from organs at post mortem

Methods of sampling (description of sampling techniques)

Animals at farm

Voluntary samples usually sent by a private veterinarian for diagnostic purposes

Case definition

Animals at farm

Culture and isolation of Salmonella from samples taken from the animal/flock or associated with its environment. Reports of Salmonella isolates under the Zoonoses Order are classed as positive.

Diagnostic/analytical methods used

Animals at farm

Various

Vaccination policy

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

Control program/mechanisms

The control program/strategies in place

Operators are encouraged to monitor in the same way as for Gallus gallus under Regulation (EC) No. 2160/2003, but there is no statutory Salmonella National Control Programme in the goose industry sector in the UK. All Salmonellae isolated must be reported to the Competent Authority under the requirements of national legislation. Advice on disease control measures is given and visits to the farm by Government officials may be made, particularly if the Salmonella is considered to be 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 geese. Assistance is given to the public health authorities with on-farm investigations and epidemiological studies if there is a outbreak of salmonellosis in humans associated with the farm.

Measures in case of the positive findings or single cases

Advice is given on control of Salmonella and farm visits may be made by the veterinary and public health authorities. Restrictions may be placed on the premises under the Zoonoses Order.

Notification system in place

All isolations of Salmonella must be reported to the Competent Authority and a culture supplied to the National Reference Laboratory under the Zoonoses Order 1989 in Great Britain and the Zoonoses Order (Northern Ireland) 1991 in Northern Ireland. Units tested are not known because the private laboratories do not report negative results unless sampling is carried out as part of an official control programme or survey.

Results of the investigation

Submission of samples from geese is most likely to be for diagnostic purposes. There were no report sof Salmonella in geese in GB in 2015.

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

There have been very few reports of Salmonella from geese in recent years.

2.2 CAMPYLOBACTERIOSIS

2.2.1 Campylobacter in foodstuffs

2.2.1.1 Campylobacter spp., unspecified in food - Retail Chicken Survey 2014/15

Monitoring system

Sampling strategy

Retail Survey

Type of specimen taken

UK produced whole, fresh chickens 25g of neck skin and packaging swab

Methods of sampling (description of sampling techniques)

Sampling plan based on 2010 market share data, sampling from 7 main retailers, plus butchers and other smaller retailers.

Diagnostic/analytical methods used

Prevalence and enumeration of Campylobacter levels based on method described in EN/ISO/TS 10272-2:2006 Microbiology of food and animal feeding stuffs Horizontal method for detection and enumeration of Campylobacter spp Part 2: Colony-count technique.

Control program/mechanisms

The control program/strategies in place

Tackling Campylobacter specifically is a top priority for the Food Standards Agency. We have established the Acting on Campylobacter Together (ACT) initiative to bring together the whole food chain to reduce levels of Campylobacter in chicken and to reduce the burden of foodborne illness in the UK. Further details can be found at: http://www.food.gov.uk/news-updates/campaigns/campylobacter/actnow

Recent actions taken to control the zoonoses

To measure progress on the effectiveness of this work, a joint government and industry target to reduce Campylobacter in UK produced chickens by 2015 has been set. The Food Standards Agency, Defra, the UK poultry industry, and major retailers have agreed a new target that will measure efforts to reduce the levels of Campylobacter in chickens. The target is for the industry to reduce the numbers of the most contaminated carcases (>1,000 cfu/g) in UK poultry houses from 27% to 10% by 2015.
http://www.food.gov.uk/science/microbiology/campylobacterevidenceprogramme/

Results of the investigation

A final report which included the full analysis of the data from the survey carried out between February 2014 and February 2015 was published in September 2015 and can be found here: http://www.food.gov.uk/sites/default/files/campylobacter-retail-survey-final-report.pdf Overall, the results of the 12 months survey (please be aware that sampling was carried out between February 2014 March 2015) showed: 73% of chickens tested positive for the presence of Campylobacter (above limit of detection; >10 cfu/g). 19% of chickens tested positive for Campylobacter within the highest band of contamination (>1,000 cfu/g). 0.1% (5 samples) of packaging tested positive at the highest band of contamination 7% of packaging tested positive for the presence of Campylobacter

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

Research has shown that reducing the numbers of the most highly contaminated birds would reduce the public health risk by between 50% and 90%, saving over 100,000 people a year from falling prey to a form of food poisoning which can result in permanent paralysis.

2.2.1.2 Campylobacter spp., unspecified in food - Retail Chicken Survey 2015/16

Monitoring system

Sampling strategy

Retail Survey

Type of specimen taken

UK produced whole, fresh chickens: 25g of neck skin and packaging swab

Methods of sampling (description of sampling techniques)

An equal number of samples (100 per quarter per retailer) is collected form the 9 main retailers, plus butchers and other smaller retailers. Overall Campylobacter prevalence is weighted according to market share data from March 2015.

Diagnostic/analytical methods used

Prevalence and enumeration of Campylobacter levels based on method described in EN/ISO/TS 10272-2:2006 Microbiology of food and animal feeding stuffs Horizontal method for detection and enumeration of Campylobacter spp Part 2: Colony-count technique.

Control program/mechanisms

The control program/strategies in place

Tackling Campylobacter specifically is a top priority for the Food Standards Agency. We have established the Acting on Campylobacter Together (ACT) initiative to bring together the whole food chain to reduce levels of Campylobacter in chicken and to reduce the burden of foodborne illness in the UK. Further details can be found at: http://www.food.gov.uk/news-updates/campaigns/campylobacter/actnow

Recent actions taken to control the zoonoses

To measure progress on the effectiveness of this work, a joint government and industry target to reduce Campylobacter in UK produced chickens by 2015 has been set. The Food Standards Agency, Defra, the UK poultry industry, and major retailers have agreed a new target that will measure efforts to reduce the levels of Campylobacter in chickens. The target is for the industry to reduce the numbers of the most contaminated carcases (>1,000 cfu/g) in UK poultry houses from 27% to 10% by 2015.
http://www.food.gov.uk/science/microbiology/campylobacterevidenceprogramme/ By the end of 2015, the target was not achieved across the industry as a whole. However, due to the measurable progress being made by the industry it was agreed to roll the target over to the end of 2016.

Results of the investigation

Still ongoing (survey commenced July 2015) Results are published on a quarterly basis. Results from the first two quarters (sampling from July to December) showed: July 2015 to September 2015 (total sample number 1032): 76.3% of skin samples were positive for Campylobacter (774 samples) 14.9% of chickens (skin samples) had levels of Campylobacter above 1000 cfu/g (148 samples) 6.4% (68 samples) of packaging samples were positive for Campylobacter and 0.3% of packaging samples (3 samples) had a level Campylobacter above 1000 cfu/swab. October 2015 to December 2015 (total sample number 966): 58.9% of skin samples were positive for Campylobacter (566 samples) 10.7% of skin samples had high levels of Campylobacter over 1000 cfu/g (104 samples) 5.7% (56 samples) of packaging samples were positive for Campylobacter and 0.1% (1 sample) of packaging samples had a level Campylobacter above 1000 cfu/swab

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

Foodborne Campylobacter is estimated to make more than 280,000 people ill each year in the UK and is the biggest cause of food poisoning. An EFSA Opinion stated that up to 80% of cases can be attributed to raw poultry meat and a tenfold decrease in the exposure levels from this source is likely to reduce the number of human Campylobacter cases by 50 to 90% across all Member States.

2.2.2 Campylobacter in animals

2.2.2.1 Campylobacter in animal - Gallus gallus (fowl) - broilers - Data from GB

Monitoring system

Sampling strategy

A quantitative Campylobacter monitoring programme of broiler slaughter batches and broiler carcasses, based on EU technical specifications in Decision 2007/516/EC. The monitoring began in March 2012 and will conclude in December 2016 with the aim of monitoring the level of Campylobacter carcass contamination, determine if there is a significant change in the number of carcasses with the highest levels of Campylobacter contamination and provide baseline data to feed into risk assessment models ubTitle order number and then Subtitle Text

Frequency of the sampling

At slaughter Carcase: total samples were spread evenly across the year with 1/12th of the total samples taken each month. Caeca: total samples were spread evenly across the year with 1/12th of the total samples taken each month.

Type of specimen taken

At slaughter Carcase: neck skin sample taken from carcase after chilling and before further processing. Caeca: intact caecae taken at time of evisceration (caecal content).

Methods of sampling (description of sampling techniques)

Enter SuAt slaughter Carcase: The study unit was a slaughter batch defined as a delivery of chickens, which have been raised in the same flock, to a slaughterhouse on one single day. The target population was large abattoirs that produce, in total, more than 85% of the annual UK broiler slaughter throughput. The sampling was randomised (by abattoir, day of sampling and batch) and weighted according to abattoir throughput. Caeca: The study unit was a slaughter batch defined as a delivery of chickens, which have been raised in the same flock, to a slaughterhouse on one single day. The target population was large abattoirs that produce, in total, more than 85% of the annual UK broiler slaughter throughput. The sampling was randomised (by abattoir, day of sampling and batch) and weighted according to abattoir throughput. bTitle order number and then Subtitle Text

Case definition

At slaughter Carcase: Positive slaughter batch a batch where at least one of ten colonies from a sample was confirmed as thermotolerant Campylobacter spp. Caeca: Positive slaughter batch - a batch where at least one of ten colonies from a sample was confirmed as thermotolerant Campylobacter spp.

Diagnostic/analytical methods used

Samples were tested for detection and quantification of thermotolerant Campylobacter spp. following ISO10272:2006 part 2. Confirmation and speciation of Campylobacter were undertaken as described in ISO 10272:2006, using biochemical methods. Samples were tested before 80 hours from collection.

Vaccination policy

None

Control program/mechanisms

The control program/strategies in place

A Campylobacter Risk Management Programme has been developed to reduce levels of Campylobacter in chicken. The programme encompasses a range of projects targeted at different points across the food chain, from farm to fork. The Food Standards Agency (FSA) is working in partnership with the industry and Defra as part of a Joint Working Group on Campylobacter. The working group has developed a Joint Action Plan, which will help identify and implement interventions that will reduce Campylobacter. To contribute to this work the Agency is also funding new research in collaboration with the Biotechnology and Biological Sciences Research Council (BBSRC), Defra, the Northern Ireland Department for Agriculture and Rural Development and the Scottish Government, the research forms part of a joint strategy entitled: UK Research and Innovation Strategy for Campylobacter (UK RISC) in the food chain (http://multimedia.food.gov.uk/multimedia/pdfs/campylobacterstrategy.pdf).

Recent actions taken to control the zoonoses

To measure progress on the effectiveness of the Risk Management Programme, a joint government and industry target to reduce Campylobacter in UK produced chickens by 2015 has been set. The Food Standards Agency, Defra, the UK poultry industry, and major retailers have agreed a new target that will measure efforts to reduce the levels of Campylobacter in chickens. The target is for the industry to reduce the numbers of the most contaminated carcases (>1,000 cfu/g) in UK poultry houses from 27% to 10% by 2015. http://www.food.gov.uk/science/microbiology/campylobacterevidenceprogramme/

Results of the investigation including the origin of the positive animals

In 2015, 501 neck skin samples were tested with 59.7% (n=299) positive for C. jejuni and 11.0% (n=55) positive for C. Coli. Of the 501 caecal contents samples tested 16.2% (n=81) were positive for C. Coli and 53.7% (n=269) for C. jejuni. The enumeration results indicated that there was no statistically significant difference in the percentage of birds with more than 1,000 cfu/g contamination compared to the UK 2008 EU baseline survey results.

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

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection) It is estimated that achievement of the reduction target above could mean a reduction in Campylobacter food poisoning of up to 30% about 111,000 cases per year.

2.3 LISTERIOSIS

2.3.1 General evaluation of the national situation

2.3.1.1 Listeria - general evaluation

History of the disease and/or infection in the country

Listeria monocytogenes is widely distributed in the environment, including soil, decaying vegetation and fodder such as silage in which the bacteria can multiply. In humans the disease most commonly occurs in pregnant women, neonates and people over the age of 60 years with a range of underlying medical conditions including cancer and diabetes. Consumption of foods contaminated with L. monocytogenes is the main route of transmission to humans. Zoonotic infection acquired directly from animals is also possible, although cases reporting animal contact are rare. In animals, listeriosis is chiefly a disease of farmed ruminants, with cattle and sheep considered the most frequently clinically infected species. Infection is opportunistic, and may occur through umbilical infection in the neonatal period, or more commonly though the ingestion of soil or soil-contaminated feed, notably poor quality silage. Laboratory reports of listeriosis in humans in the UK have fallen from a peak in the late 1980s following targeted provision of advice to pregnant women to avoid ripened soft cheeses and pts. Listeriosis is a rare disease in the UK and numbers remained low, at around 100 - 150 UK cases per year up to 2003 when an increase in the number of cases to around 200 per year was noted, mainly attributable to an increase in England and Wales. The rise in the number of cases has occurred particularly in people over 60 years of age and the reason for this increase is unknown. The number of pregnancy-associated cases has remained relatively low. In an attempt to try and understand this increase, several surveys focused on ready-to-eat foods that have been linked to the recent rise and/or from case food histories have been carried out over recent years with the aim to investigate the microbiological quality of these products (results reported in previous annual reports). The potential link, if any, between listeriosis infection in animals and infection in humans still remains unclear. In animals in the UK, the majority of cases occur between January and April when animals are housed. This peak in cases is linked to the feeding of poorly fermented soil-contaminated silage.

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

Food data: Results of surveys carried out in 2015 are given in the tables. Listeria spp were detected in 24 of the 915 milk and dairy product samples tested during the year. Animals: During 2015, there were 201 incidents of listeriosis confirmed in animals in Great Britain and Northern Ireland, with diagnoses achieved via the submission of clinical material by private veterinarians for diagnostic investigation at the Animal and Plant Health Agency, Scotland's Rural Colleges and the Agri-food and Biosciences Institute. Of the total, 118 incidents were recorded in Great Britain and 22 in Northern Ireland. In Great Britain there were 30 incidents in cattle, where Listeria spp was diagnosed as the cause of abortion, mastitis, iritis or encephalitis, usually associated with the feeding of poor quality silage. In sheep and goats, there were 88 incidents where listeriosis was diagnosed, as the cause of meningitis, septicaemia or abortions. In 2015, the percentage of foetopathy cases in sheep and goats in Great Britain due to infection with Listeria spp as a percentage of all diagnoses was 2.8% out of a total 829 incidents of diagnosed fetopathy investigated during the year. In 2014 the percentage of foetopathy cases in sheep and goats due to infection with Listeria spp as a percentage of all diagnoses was 3.8% (26 cases of 685 investigations). In 2013 the percentage was 2.8%. This was higher than in 2012 (1.6%), but roughly consistent with previous years results of 3.4% (2011) and 2.5% (2010). In Northern Ireland, there were 10 incidents reported cattle, 9 incidents in sheep, 1 incident in a chicken, 1 report from a horse and 1 from a donkey during 2013. In 2014 there were 196 incidents of listeriosis confirmed in animals in Great Britain and Northern Ireland: 149 incidents were recorded in Great Britain and 47 in Northern Ireland.In 2013 there were 200 incidents of listeriosis confirmed in animals in Great Britain and Northern Ireland: 178 incidents were recorded in Great Britain and 22 in Northern Ireland. During 2012, there were 220 incidents of listeriosis confirmed in animals in Great Britain and Northern Ireland: 175 incidents were recorded in Great Britain and 45 in Northern Ireland. During 2011, listeriosis was diagnosed in 164 incidents in animals in the UK: of these, 146 and occurred in Great Britain and 18 in Northern Ireland. Numbers of diagnoses of listeriosis vary between years, and are influenced by submission rates to diagnostic laboratories, but also by climatic factors which may influence silage quality or soil exposure for grazing animals. The data reported in the table for prevalence in animals summarises confirmed clinical diagnoses of listeriosis from specimens submitted to APHA, SRUC and AFBI laboratories during 2015. For Great Britain data, diagnoses use strict criteria and are recorded (once only per incident) using the Veterinary Investigation Diagnostic Analysis (VIDA) system.

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

It is believed that consumption of contaminated foods is the main transmission route for both people and animals. Human infection acquired directly from animals is possible, but apart from a few cases it is not clear what, if any, connection there is between human listeriosis and animal listeriosis.

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

It is believed that consumption of contaminated foods is the main transmission route for both people and animals. Human infection acquired directly from animals is possible, but apart from a few cases it is not clear what, if any, connection there is between human listeriosis and animal listeriosis. There was one incident of note reported in 2013: an investigation was undertaken following an outbreak of listerial encephalitis in a milking sheep flock, and the subsequent isolation of Listeria spp. from the bulk milk tank. The farm supplied milk for the production of unpasteurized hard and soft cheeses, and was also open to the public. Between February and April 2013, thirteen cases of nervous disease were reported in ewes, with clinical signs consisting variously of circling, unilateral paralysis, drooling or recumbency. Post-mortem examination of one ewe in April confirmed histopathological lesions typical of listerial encephalitis, although Listeria was not isolated from either the brain or the milk of this ewe. Listeria spp. were detected from bulk milk collected by the farmer on several sampling occasions in April and also in subsequent months, but Listeria was not isolated from pooled samples from individual ewes. Following the initial detection of Listeria spp., milk ceased to be sold for the manufacture of unpasteurized cheese. A farm visit was undertaken by a Veterinary Investigation Officer in June. There had been no further cases of listerial encephalitis in ewes, and no upsurge of clinical mastitis was reported. Swabs were taken from various items of dairy equipment. Listeria monocytogenes was yielded from cultures of a swab taken from the bulk milk tank above the milk line, raising the possibility of biofilms harbouring the bacteria. Although the possibility of clinical or subclinical listerial mastitis could not be discounted, it was considered that the most likely source of this contamination was environmental. A thorough clean of the internal workings of the bulk milk tank was recommended, in addition to a thorough expert review of cleaning processes and monitoring procedures. The farmer was also made aware of the industry Code of Practice for preventing or controlling ill health from animal contact at visitor attractions.

Recent actions taken to control the zoonoses

The Food Standards Agency's Strategy for 2010-2015 includes the outcome that food produced or sold in the UK is safe to eat, and a main priority is to reduce foodborne disease using a targeted approach. The FSAs Foodborne Disease Strategy (FDS) for 2010-2015, established as one of the initiatives to deliver this objective, proposes a pathogen-specific approach to reducing human foodborne disease rates in the UK, and identifies Listeria monocytogenes (L. monocytogenes), which causes the most deaths, as a priority for action.The five-year Listeria Risk Management Programme comprises three main workstreams, each informed by research and surveillance:- Consumer behaviours and actions: activities to raise awareness and promote behaviours and actions to reduce the risk of listeriosis among key vulnerable groups, e.g. older people, pregnant women and people with existing medical conditions, particularly cancer patients.- Procurement and provision of food to vulnerable people: activities to ensure the risk of listeriosis is considered as part of food procurement and food safety management in places where vulnerable people are cared for, e.g. hospitals.- Industry compliance and enforcement: activities to improve industry compliance with the law focusing on sectors producing foods that are high-risk for Listeria monocytogenes, and to ensure enforcement in this area is robust and consistent.To achieve the greatest impact, activities are being targeted at specific high-risk food industry sectors and particular vulnerable groups of the population and the places where they are cared for. More information is available at: http://www.food.gov.uk/safereating/microbiology/listeria

Additional information

Surveillance system: 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 882/2004 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.

2.4 YERSINIOSIS

2.4.1 General evaluation of the national situation

2.4.1.1 Yersinia - general evaluation

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

Infection with yersiniosis is not notifiable in humans or animals in the UK. Human data: A small number of human cases are reported each year on a voluntary basis. Animal Data: during the year, there were 143 cases of yersiniosis reported in the UK in animals (18 in Great Britain and 125 in Northern Ireland) from clinical diagnostic samples submitted by private veterinarians to the Animal and Plant Health Agency, to Scotland's Rural Colleges and to the Agri-food and Biosciences Institute. The number of diagnoses is generally small and it is therefore difficult to comment on trends. Analysis of all incidents of fetopathy in sheep and goats in Great Britain, indicated Yersinia pseudotuberculosis accounted for 1.2% out of a total 829 incidents of all diagnoses of fetopathy investigated during the year. In 2014 there were 168 cases of yersinosis (including fetopathy) diagnosed in animals in the UK, with 82 cases identified in 2013, 50 cases in 2012, 44 cases in 2011 and in 23 cases in 2010. A study to estimate the prevalence of Yersinia, as well as other pathogens, in UK pigs at slaughter was carried out in 2013. A total of 624 carcase swabs and 620 tonsil samples, from 624 pigs, were tested for the presence of Yersinia. After accounting for clustering of pigs within farms, the prevalence of Yersinia was 32.9% (95% CI 28.8-37.0) for tonsil samples, and the prevalence in the carcase swab samples was 1.9% (95% CI 0.8-3.0).

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

Infection with yersiniosis is not notifiable in humans or animals in the UK.Human data: A small number of human cases are reported each year on a voluntary basis.Food: There were no food surveys carried out in 2013.Animal Data: during the year, there were 83 cases of yersiniosis reported in the UK in animals (11 in Great Britain and 72 in Northern Ireland) from clinical diagnostic samples submitted by private veterinarians to the Animal Health and Veterinary Laboratories Agency, the Scotland's Rural Colleges and the Agri-food and Biosciences Institute. The number of diagnoses is generally small and it is therefore difficult to comment on trends. Analysis of all incidents of fetopathy in sheep and goats in Great Britain, indicated Yersinia pseudotuberculosis accounted for 0.7% out of a total 907 incidents of all diagnoses of fetopathy investigated during the year. In 2012, 50 cases, in 2011, 44 cases and in 2010, 23 cases of yersiniosis (including fetopathy) were diagnosed in animals in the UK. A study to estimate the prevalence of Yersinia, as well as other pathogens, in UK pigs at slaughter was carried out in 2013. A total of 624 carcase swabs and 620 tonsil samples, from 624 pigs, were tested for the presence of Yersinia. After accounting for clustering of pigs within farms, the prevalence of Yersinia was 32.9% (95% CI 28.8-37.0) for tonsil samples, and the prevalence in the carcase swab samples was 1.9% (95% CI 0.8-3.0).

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

Transmission 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. Y. enterocolitica has been isolated from many domestic and wild mammals, birds and some cold-blooded animals. More than 50 serotypes have been identified, not all of which cause disease in animals and man. Y. pseudotuberculosis has been isolated from various species of wild and domestic mammals, birds and reptiles.

2.4.2 Yersinia in animals

2.4.2.1 Yersinia in animal - Pigs

Monitoring system

Sampling strategy

Animals at slaughter (herd based approach)

A study to estimate the prevalence of Salmonella, Toxoplasma, Yersinia, Hepatitis E virus (HEV), Porcine Reproductive and Respiratory Syndrome virus (PRRSv) and extended spectrum -lactamase (ESBL) E. coli in UK pigs at slaughter and to investigate antimicrobial resistance (AMR) in Campylobacter coli was carried out in 2013. This was the first UK-wide study of Toxoplasma, HEV, PRRSv and ESBL E. coli in pigs.The study design was consistent, where possible, with the technical specifications for the EU baseline survey for Salmonella in slaughter pigs (Commission Decision 2006/668/EC), with a target sample size of 600 pigs. In anticipation of non-responses or inadequate samples, a further 10% of pigs were scheduled for sampling. The study was carried out at the 14 largest abattoirs of the 169 approved premises in the UK who between them process 80% of pigs slaughtered in the UK. Sampling was weighted so that the number of carcases to sample in each of the selected abattoirs was proportional to the throughput of the abattoir. Overall, 654 pigs were scheduled for sampling during the study period.

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling was scheduled to take place between 14th January 2013 and 12th April 2013. The sampling schedule was randomized so that the day of sampling and the carcase to be sampled on a given day was based on a random selection. The sampling day within each month was randomly chosen from the days the selected slaughterhouse was usually open. The individual carcase to be sampled was randomly chosen from the total number of carcases that the selected slaughterhouse processed daily. The total number of carcases to be sampled was stratified by calendar month.

Type of specimen taken

Animals at slaughter (herd based approach)

Tonsils and a carcass swab

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Samples were collected by trained staff of the Food Standards Agency (FSA) in Great Britain and by the Veterinary Public Health Unit of the Department of Agriculture and Rural Development (DARD) in Northern Ireland. Tonsils were collected at the evisceration point and two carcase swabs at pre-chill. One carcase swab was taken on the left or right side of the carcase using one single sponge for all four sites described in Annex A of Standard ISO 17604 (hind limb, abdomen, mid-dorsal region, jowl). The second carcase swab was taken, using the same sites, but on the opposite side of the carcase. One carcass swab was tested for Salmonella and one for Yersinia. All samples taken were from carcasses deemed fit for consumption by the Competent Authority. The exclusion criteria were as follows: any carcase that was totally condemned; animals with a live weight of less than 50kg; animals that had undergone emergency slaughter; and animals kept in the UK for less than 3 months prior to slaughter were excluded from the study.

Diagnostic/analytical methods used

Animals at slaughter (herd based approach)

Yersinia enterocolitica was isolated by the cold enrichment method. A tonsil scrape was added to one universal of Phosphate Buffer Solution (PBS) and a carcase swab was rinsed in PBS to achieve approximately a 10% v/v suspension. In addition, 2ml of a control sample, spiked with 2 to 3 colonies of Y. enterocolitica (NCTC 10460 FD NO. 3067), was added to a universal of PBS (10% v/v) and processed in parallel with each batch of test samples. The samples were stored at 2-8degreesC and sub-cultured weekly; 0.1ml was subcultured onto Yersinia selective agar (Oxoid CIN MED PO0287A) for 3 successive weeks. The plates were incubated at 30degreesC and examined at 24 hours and 48 hours. Identification of Y. enterocolitica was confirmed by colony morphology and biochemical tests (API 20E, Biomerieux).Any samples that arrived at the testing laboratory more than 96 hours after sample collection were excluded from testing/analysis.

Results of the investigation

Overall, 624 carcase swabs and 620 tonsil samples, from 624 pigs, were tested for the presence of Yersinia. One third (204/620; 32.9%) of the tonsil samples tested positive for Yersinia compared with only 1.9% (12/of 624) of the carcase swabs. For tonsil samples, the prevalence was 32.9% (95% CI 28.8-37.0), after accounting for clustering within farms, and for carcase swabs the prevalence was 1.9% (95% CI 0.8-3.0). Of the 620 pigs for which both sample types were collected, 10 (1.6%) pigs tested positive in both samples with the remaining 196 (31.6%) pigs testing positive in only one sample. The kappa test confirmed the poor agreement between the sample types (kappa statistic=0.06) with, unsurprisingly, very strong evidence that the tonsils identified significantly more positive pigs than the carcase swabs (p0.001). The proportion of pigs that tested positive for Yersinia in the tonsils was not found to vary significantly between the different months of sampling (p=0.22).The majority of the positive pigs (87.3%) and carcases (91.7%) were infected with Y. enterocolitica. A further 21 (10.3%) of the positive pigs were infected with Y. pseudotuberculosis. After accounting for within-farm clustering, the prevalence of Y. enterocolitica carriage was 28.7% (95% CI 24.8-32.7) whilst the prevalence on carcases was 1.8% (95% CI 0.7-2.8). The prevalence of Y. pseudotuberculosis carriage was 3.4% (95% CI 2.0-4.8). There was no apparent clustering of the less common Yersinia species (Y. frederiksenii/ intermedia, Y. kristensenii and Y. pseudotuberculosis) within a particular geographic region.Roughly a quarter of the pigs aged <6 months and >12 months were found to carry Yersinia in the tonsils compared to roughly a third of those aged 6-12 months (p=0.22). All of the positive carcase swabs were from pigs aged 6-12 months.The abattoirs participating in the survey processed 80% of the UK pig slaughter throughput; this coverage combined with the randomized sampling approach provides a robust and representative estimates of prevalence.There are a number of issues to consider when interpreting the data presented in this report. The sampling schedule (the day of sampling and the carcase to be sampled) was randomised, hence for some abattoirs more than one carcase was sampled on a given day which could have resulted in pigs being sampled from the same farm on the same day. However this only occurred in two instances and would suggest limited clustering of pigs. In addition, all of the prevalence and seroprevalence data presented were adjusted to take into account within-farm clustering.

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

The prevalence of Y. enterocolitica carriage identified in the 2013 study to estimate the prevalence of Yersinia in UK pigs at slaughter was significantly higher than the results from the 2003 UK abattoir survey [28.7% (95% CI 24.8-32.7) versus 10.2% (95% CI 8.911.5)] and is higher than Y. enterocolitica carriage reported in other studies. However the studies are not directly comparable: in the 2013 study, tonsil samples were tested for Yersinia spp. compared to caecal samples in the 2003 survey and higher rates of carriage were found in the 2003 survey during December to May, which includes the sampling timeframe for this study. Therefore the increase seen may be, in part, an artefact of the study design; if sampling had been carried out throughout the year, lower isolation rates may have been observed thus reducing the overall prevalence. The apparent rise in the prevalence of Yersinia should be treated with caution given the lack of a comparable method across the studies. Y. pseudotuberculosis was identified in 10.3% of the positive pigs (3.4% prevalence overall); in a previous study in England by Ortiz Martinez et al. (2010) 18% of the pigs were found to carry Y. pseudotuberculosis. This is the first time a UK-wide study, representative of the UK pig population, has been undertaken to assess the contamination of carcases with Yersinia. Although over one quarter of the pigs were found to be carrying Y. entercolitica, very few carcases (2%) were contaminated with this organism.

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

The prevalence of Y. enterocolitica carriage was significantly higher in this study compared with the 2003 UK abattoir survey [28.7% (95% CI 24.8-32.7) versus 10.2% (95% CI 8.911.5)] and is higher than Y. enterocolitica carriage reported in other studies. However the studies are not directly comparable: in this study, tonsil samples were tested for Yersinia spp. compared to caecal samples in the 2003 survey and higher rates of carriage were found in the 2003 survey during December to May, which includes the sampling timeframe for this study. Therefore the increase seen may be, in part, an artefact of the study design; if sampling had been carried out throughout the year, lower isolation rates may have been observed thus reducing the overall prevalence. The apparent rise in the prevalence of Yersinia should be treated with caution given the lack of a comparable method across the studies. Y. pseudotuberculosis was identified in 10.3% of the positive pigs (3.4% prevalence overall); in a previous study in England by Ortiz Martinez et al. (2010) 18% of the pigs were found to carry Y. pseudotuberculosis.This is the first time a UK-wide study, representative of the UK pig population, has been undertaken to assess the contamination of carcases with Yersinia. Although over one quarter of the pigs were found to be carrying Y. entercolitica, very few carcases (2%) were contaminated with this organism.

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

The number of confirmed human cases of Y. enterocolitica and other Yersinia spp. in the UK has risen again in recent years following a decline to 55 confirmed cases in 2012. The number of cases in the UK are low compared to other European countries, probably due to the low consumption of raw pork in the UK (Rosner et al., 2010). Pigs are considered to be the primary reservoir of human pathogenic Y. enterocolitica strains, mainly because of the high prevalence of such strains in pigs and the high genetic similarity between human and porcine isolates. Yersinia was identified in the EFSA opinion on meat inspection in pigs as one of the four major public health hazards. During the 2013 UK abattoir study of slaughter pigs approximately one quarter were found to be infected with Y. enterocolitica, however very few carcases (2%) were contaminated with this organism. It is encouraging that so few carcases were found to be contaminated with the organism indicating that the processes applied at the abattoir to reduce contamination of the carcases are having a positive effect and are effective in preventing widespread contamination of carcases. Most Y. enterocolitica types associated with human infections belong to bioserotypes 1B/O:8, 2/O:9, 3/O:3, 4/O:3, and 2/O:5,27. In a previous study of English pigs at slaughter, the most common biotypes of Y. enterocolitica were 2/O:9 (33%) and 2/O:5 (26%) (Ortiz Martinez et al., 2010). Biotyping of the isolates was not undertaken in this study because of the low prevalence and therefore hazard on the carcasses, so the predominant type and range of biotypes cannot be reported.

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

The number of confirmed human cases of Y. enterocolitica and other Yersinia spp. in the UK has declined in recent years with 55 confirmed cases in 2012. The number of cases in the UK are low compared to other European countries, probably due to the low consumption of raw pork in the UK (Rosner et al., 2010). Pigs are considered to be the primary reservoir of human pathogenic Y. enterocolitica strains, mainly because of the high prevalence of such strains in pigs and the high genetic similarity between human and porcine isolates. Yersinia was identified in the recent EFSA opinion on meat inspection in pigs as one of the four major public health hazards.Approximately one quarter of slaughter pigs were found to be infected with Y. enterocolitica, however very few carcases (2%) were contaminated with this organism. It is encouraging that so few carcases were found to be contaminated with the organism indicating that the processes applied at the abattoir to reduce contamination of the carcases are having a positive effect and are effective in preventing widespread contamination of carcases. Most Y. enterocolitica types associated with human infections belong to bioserotypes 1B/O:8, 2/O:9, 3/O:3, 4/O:3, and 2/O:5,27. In a previous study of English pigs at slaughter, the most common biotypes of Y. enterocolitica were 2/O:9 (33%) and 2/O:5 (26%) (Ortiz Martinez et al., 2010). Biotyping of the isolates was not undertaken in this study because of the low prevalence and therefore hazard on the carcasses, so the predominant type and range of biotypes cannot be reported.

Additional information

Information on the 2013 slaughterhouse survey of pigs taken from 'Powell et al. (2014) Study of Salmonella, Toxoplasma, Hepatitis E virus, Yersinia, Porcine Reproductive and Respiratory Syndrome virus, antimicrobial resistance in Campylobacter and extended spectrum beta lactamase E. coli in UK pigs at slaughter: OZ0150 final report' (available on Defra website). The project was funded by Defra, the Food Standards Agency, the British Pig Executive, the Veterinary Medicines Directorate, Public Health England and Public Health Wales. We thank Industry for supporting this work and the abattoirs for participating in this study.

2.5 TRICHINELLOSIS

2.5.1 General evaluation of the national situation

2.5.1.1 Trichinella - general evaluation

History of the disease and/or infection in the country

Humans:There have been no known cases of human trichinosis acquired from infected meat from animals reared in the United Kingdom either in the UK or in other countries that have received meat and meat products from the UK since 1975. Overall, there were no laboratory-confirmed cases of Trichinellosis between 1987 and 1999 in the UK. Ten cases of trichinellosis were diagnosed in England and Wales between 2000 and 2010, which included an outbreak of eight cases in 2000 associated with the consumption of imported pork salami. The remaining 2 cases were travel-related. Animals:The last positive diagnosis in pigs in Great Britain was in 1978. In Northern Ireland, the last confirmed case of Trichinellosis in pig meat was in 1979. This case was linked to suspected illegally imported meat.

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

There were no human cases of trichinosis reported in England, Wales, Scotland or Northern Ireland in 2013. There is no evidence to indicate that Trichinella exists in pigs, wild boar or horses in the UK, as shown by the negative results from carcasses that are tested annually. Pigs, horses and wild boar are routinely monitored for the presence of Trichinella. In the UK in 2015, 6,112,998 muscle samples from domestic pigs were examined for Trichinella. In addition, 3,595 horses, 1,120 farmed wild boar and 14 feral wild boar muscle samples were examined. All samples yielded negative results. An ongoing survey of Trichinella in foxes was carried out by the Food Standards Agency (FSA) in the United Kingdom between January 2015 and April 2015. In total, 39 samples were examined of which none were positive.

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

There is no evidence to indicate that Trichinella exists in pigs or wild boar in the UK, as shown by the negative results from carcasses and wildlife that are tested annually.

Additional information

From January 2006, enhanced testing for Trichinella, by the EU pepsin digest method, was extended to the domestic slaughter of all boars, sows and farmed wild boar that are processed in a slaughterhouse and feral wild boar processed in an Approved Game Handling Establishment. In 2008, a voluntary programme for testing feral wild boar hunted for own consumption or direct supply was also introduced. Testing of samples is undertaken by laboratories in the slaughterhouse, accredited contract laboratories or at the accredited contract laboratory appointed by government. All laboratories take part in a laboratory quality assurance programme organised by the National Reference Laboratory.

2.5.2 Trichinella in animals

2.5.2.1 Trichinella in animal - Solipeds, domestic - horses

Monitoring system

Sampling strategy

Surveillance system: Regulation (EC) No. 2015/1375 lays down specific rules on official controls for Trichinella in meat. It requires carcases of horses to be sampled in slaughterhouses.

Frequency of the sampling

Every carcase at slaughter

Type of specimen taken

As per legislation. Sample size 5 grams

Case definition

Detection of Trichinella spp. larvae.

Diagnostic/analytical methods used

Digestion method as per the legislation

Notification system in place

Notified to the Food Standards Agency and Department of Environment, Food and Rural Affairs (Defra) in Great Britain / Department of Agriculture , Environment and Rural Affairs in Northern Ireland.

Notification system in place

Notified to the Food Standards Agency and Department of Environment, Food and Rural Affairs (Defra) in Great Britain / Department of Agriculture and Rural Development in Northern Ireland.

Results of the investigation including the origin of the positive animals

A total of 3,595 horses were tested at slaughter in 2015. There were no positive findings during the year.

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

Horses are routinely monitored for the presence of Trichinella at the slaughterhouse. There was no evidence to indicate that trichinellosis existed in the UK horse population in 2015.

2.5.2.2 Trichinella in animal - Pigs

Officially recognised regions with negligible Trichinella risk

The UK has applied to be a region with negligible risk from Trichinella. There is no evidence to indicate that Trichinella exists in pigs or wild boar in the UK, as shown by the negative results from carcasses and wildlife that are tested annually.

Monitoring system

Sampling strategy

General

Surveillance system: Regulation (EC) No. 2015/1375 lays down specific rules on official controls for Trichinella in meat. It also lays down the methods of detection to be used and requires carcases of domestic swine to be sampled in slaughterhouses and tested for the presence of Trichinella as part of the post mortem inspection. Carcasses of horses, wild boar and other farmed and wild animal species susceptible to Trichinella infection are also required to be sampled in slaughterhouses or game handling establishments. Carcases of domestic swine kept solely for fattening and slaughter can be exempt from testing if they come from a holding or category of holding that has been officially recognised by the Competent Authority as operating under controlled housing conditions in accordance with the criteria specified in Regulation (EU) No. 2015/1375. Systematic testing of pigs from a holding or a compartment officially recognised as applying controlled housing conditions may also be reduced if the holding or compartment can demonstrate that no autochthonous Trichinella infestations in domestic swine have been detected in the Member State in the past three years and that prevalence of Trichinella does not exceed one per million in that population.

Frequency of the sampling

General

As per the legislation for sows, boars and wild boar together with a proportion of finishing pigs plus all pigs that are not from holdings or compartments operating under controlled housing conditions..

Type of specimen taken

General

As per the legislation. Sample size 1 gram for domesticated pigs, 2 grams for breeding animals and 5 grams for farmed/wild boar.

Methods of sampling (description of sampling techniques)

General

As per the legislation

Case definition

General

Detection of Trichinella spp. larvae.

Diagnostic/analytical methods used

General

From January 2006, testing for Trichinella spiralis, by the EU muscle digest method as per legislation. Other equivalent methods are allowed in legislation but are not currently used.

Notification system in place

In the UK in 2015, 6,112,998 muscle samples from domestic pigs were examined for Trichinella. All samples yielded negative results. For wild boar - farmed and feral: Farmed wild boars - UK: 1,120 tested, 0 positive, Feral wild boars - UK: 14 tested, 0 positive.

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

Since January 2006 all boars, sows, farmed wild boar processed in a slaughterhouse and feral wild boar processed through an Approved Game Handling Establishment together with a proportion of finishing pigs are routinely monitored for the presence of Trichinella. There was no evidence to indicate that trichinellosis existed in the UK domesticated pig population or the farmed/wild boar population in 2015. The last positive diagnosis in pigs in Great Britain was in 1978. In Northern Ireland, the last confirmed case of Trichinellosis in pig meat was in 1979. This case was linked to suspected illegally imported meat.

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

No known cases of human trichinosis acquired from infected meat from animals reared in the United Kingdom have been identified either in the UK or in other countries that have received meat and meat products from the UK since 1975.There were no human cases reported in England, Wales, Northern Ireland or Scotland in 2015. The last recorded outbreak in the UK, albeit involving imported food, was of eight cases reported in 2000.

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

No known cases of human trichinosis acquired from infected meat from animals reared in the United Kingdom have been identified either in the UK or in other countries that have received meat and meat products from the UK since 1975.There were no human cases reported in England, Wales, Northern Ireland or Scotland in 2011. The last recorded outbreak in the UK, albeit involving imported food, was of eight cases reported in 2000.

2.6 ECHINOCOCCOSIS

2.6.1 General evaluation of the national situation

2.6.1.1 Echinococcus - general evaluation

History of the disease and/or infection in the country

Echinococcus granulosus is present in areas of the UK. E. multilocularis has not been found in the indigenous UK animal population. Humans: The number of indigenously acquired human cases of hydatidosis (E. granulosus) in the UK is usually very low, with an average of one new case identified approximately every five years. Indigenously aquired E. multilocularis infection has not been diagnosed in humans in the UK. Animals: In the UK, E. granulosus is present in the farmed livestock population. Hydatid disease in animals is not notifiable in the UK 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 Official Inspector or Official Veterinarian. Meat inspection in all approved slaughterhouses is carried out by or is under the supervision of an Official Veterinarian in Great Britain and the post mortem findings are recorded centrally. In Northern Ireland, Veterinary Service staff are situated in all meat plants and carry out post mortem inspection of all carcases, including inspection for evidence of hydatid cysts. E. multilocularis has not been found in indigenous animals in the UK.

History of the disease and/or infection in the country

Echinococcus granulosus is present in areas in Scotland, England and Wales. E. multilocularis has not been found in the indigenous UK animal population. Humans:The number of indigenously acquired human cases of hydatidosis (E. granulosus) in the UK is usually very low, with an average of one new case identified approximately every five years. Indigenously aquired E. multilocularis infection has not been diagnosed in humans in the UK. Animals:In Great Britain, E. granulosus (sheep strain) is present in the sheep and cattle population. Hydatid disease in animals is not notifiable in the UK 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 Official Inspector or Official Veterinarian. Meat inspection in all approved slaughterhouses is carried out by or is under the supervision of an Official Veterinarian in Great Britain.

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

Echinococcus granulosus: The identification of cysts that are reported as the finding of hydatid disease at post mortem inspection of livestock slaughtered for human consumption at licensed abattoirs in the UK occurs regularly. However these cysts are not subject to further investigation and so their identification does not give a specific overview of hydatid prevalence. The impact of the disease on the health of the individual animal is negligible, with only marginal economic losses to the individual farmer from condemnation of affected organs, principally the liver. Echinococcus multilocularis: As part of an annual, continuous monitoring programme in wild definitive hosts to demonstrate disease freedom in the UK, faecal samples are collected from Red Foxes (Vulpes vulpes) and tested for the presence of E.multilocularis and E. granulosus. In total in 2015, 367 faecal samples were collected in Great Britain and a further 324 were collected and tested in Northern Ireland. Of the total 691 foxes tested in the UK during the year, all tested negative for E.multilocularis and E. granulosus. These results are supported by previous surveys and give 99.5% confidence that E. multilocularis is not present in the UK Red Fox population at a prevalence of 1% or greater.

Recent actions taken to control the zoonoses

Echinococcus multilocularis: Under EU Commission Delegated Regulation (EU) No 1152/2011, which came into force on the 1st January 2012, surveillance of the wild definitive hosts (Red Foxes) is required to demonstrate disease freedom to justify continued preventive health measures to control E. multilocularis infection in dogs and prevent further geographical spread of the parasite to free areas within the EU. That surveillance requires the testing each year of a specified number of foxes randomly sampled from across Great Britain and Northern Ireland.

2.7 RABIES

2.7.1 General evaluation of the national situation

2.7.1.1 Lyssavirus (rabies) - general evaluation

History of the disease and/or infection in the country

The United Kingdom is recognised as having rabies free status by the O.I.E. Human rabies is extremely rare in the UK. The last indigenous human death from classical rabies occurred in 1902. Since 1902, there have been 26 reported cases of human rabies in the UK. Of these, 25 resulted from infection whilst abroad. There was one case of rabies caused by infection with European Bat Lyssavirus type 2 in 2002, which was caused by a bite from an indigenous bat. The last case of indigenous terrestrial rabies in an animal in the UK was in 1922. Rare cases of rabies in animals in quarantine (the most recent in 2008) have not affected the UK's rabies free status. In total, eleven bats have tested positive for live European Bat Lyssavirus during the passive surveillance programme in Great Britain that has been undertaken since 1987.

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

If rabies is suspected on the basis of clinical signs in humans or animals, it is compulsory to notify the relevant government departments and further investigations are carried out. Humans: There were no human cases of rabies reported in 2015. Animals: In 2015, two cats, six dogs, a rabbit and 27 zoo bats, were submitted for laboratory testing. All these samples tested negative for rabies. The Animal and Plant Health Agency (APHA) has a longstanding programme of passive scanning surveillance for European Bat Lyssavirus (EBLV) in bats in Great Britain (GB). This programme involves testing dead bats usually submitted by bat workers. Between 1987 and December 2015, 5,838 bats were tested for Lyssavirus and in that time, only eleven cases tested positive for live EBLV.

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

European Bat Lyssaviruses (EBLVs) are related to rabies virus. These viruses 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. Only EBLV 2 has been detected in the UK.

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, mainly pets. Defra follows its generic contingency plan should classical rabies be identified in animals in Great Britain and similar arrangements exist for Northern Ireland. Defra's revised Contingency Plan for Exotic Animal Diseases was laid before Parliament in December 2008. A Rabies Disease Control Strategy is published.

2.7.2 Lyssavirus (rabies) in animals

2.7.2.1 Lyssavirus (rabies) in animal - All animals

Monitoring system

Sampling strategy

If rabies is suspected on the basis of clinical signs in an animal, it is compulsory to notify the relevant government departments and further investigations are carried out. In England, Wales and Scotland, the Animal and Plant Health Agency (APHA) and in Northern Ireland the Department for Agriculture and Rural Development Veterinary Services must be notified.

Type of specimen taken

Organs/tissues: central nervous system tissue

Case definition

Rabies is confirmed if OIE prescribed tests confirm the presence of the rabies virus in the animal's tissues.

Diagnostic/analytical methods used

A number of tests may be used, including Fluorescent Antibody Test (FAT), Tissue culture test (RTCIT), Mouse inoculation test, PCR etc.

Vaccination policy

Vaccination is permitted in the United Kingdom.

2.8 Q-FEVER

2.8.1 General evaluation of the national situation

2.8.1.1 Coxiella (Q-fever) - general evaluation

History of the disease and/or infection in the country

Humans: In the UK, most Q fever cases are thought to be associated with exposure to farm animals or farm environments, however the source and route of transmission for most sporadic cases is usually not determined. Animals: Q fever is considered an endemic disease in UK livestock. A small number of cases of Q fever associated with abortion in cattle, sheep or goats are diagnosed each year.

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

Human disease: Although Q fever cases in humans are generally considered sporadic, outbreaks were reported in 2006, 2007 and 2011. The annual mean incidence rate of human infection in the UK (based on analysis of data from 1999 to 2008) is around 0.18 cases per 100,000 population/year. Mean annual incidence rates are usually higher in Northern Ireland (1.17 per 100,000/year for the period 1999 - 2008) than in England and Wales (0.14 per 100,000/year) and Scotland (0.37 per 100,000/year). The regional distribution of human cases is similar to the distribution and density of sheep populations, with the majority of cases reported from South West England, Wales, Scotland and Northern Ireland (although there were fewer human cases than might be expected in the northern regions of England). Animal Disease: Between three and eight incidents of clinical disease due to Q fever infection in livestock have been reported annually from 2008 - 2015. These are incidents where Q fever is considered to be the cause of abortion in livestock, usually ruminants. In addition, C. burnetii may be detected by PCR in placental or uterine material from submissions where Q fever was not considered to be contributing to the clinical problem of abortion. Such incidents will not be recorded as Q fever abortion under the Veterinary Investigation Diagnostic Analysis (VIDA) system reports, but are still considered of zoonotic interest as the presence of C. burnetii had been confirmed.

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

The organism is shed in the urine, faeces, milk and products of parturition of infected ruminants. The organism can survive in the environment for prolonged periods and withstand many disinfectants and extremes of temperature. Humans are usually infected through inhalation of dust or aerosols containing C. burnetii, most frequently at the time of calving, lambing or kidding (including abortion outbreaks) or at slaughter. Farm workers, veterinarians, and abattoir workers have historically been at high risk of infection, however the source and route of transmission for most sporadic cases is usually not determined. In the UK, cases generally peak during the spring/early summer lambing season when infected animals shed high numbers of organisms during lambing. Other modes of transmission to humans, including tick bites and human to human transmission, are rare. There is a weight of evidence against the foodborne route of transmission for C. burnetii, as although C. burnetii can be excreted into milk it is destroyed by pasteurisation.

Recent actions taken to control the zoonoses

Recent UK outbreaks and a large outbreak in humans in Europe have raised awareness of the risks of contracting this disease, especially to those exposed to high concentrations of the organism from placenta or birth fluids. Advice to farmers on reducing the risks from infection are highlighted annually by the veterinary and public health aurthorities in the UK. Information for farmers on Q fever infection is available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487806/Q_fever_information_for_farmers_2015.pdf

2.8.2 Coxiella (Q-fever) in animals

2.8.2.1 C. burnetii in animal

Monitoring system

Sampling strategy

Government funded scanning surveillance programmes are delivered by the Animal and Plant Health Agency (APHA), the Scottish Agricultural College Consulting, Veterinary Services (SACCVS) and the Agri-Food and Biosciences Institute (AFBI). These programmes are built upon the subsidised diagnosis and disease investigation service offered to livestock farmers through their private veterinary surgeons. Through this scanning surveillance programme, a small number of cases of Q fever associated with abortion in cattle, sheep or goats are diagnosed each year.

Frequency of the sampling

Clinical diagnostic samples submitted by private veterinarians during disease investigations. Usually submissions received for investigation of ruminant abortion.

Type of specimen taken

Tissue samples/cotyledons and foetal fluid submitted for clinical diagnosis. Blood samples

Diagnostic/analytical methods used

Routinely using modified Ziehl Nielsen (MZN) stain followed by PCR confirmation. Also ELISA and histopathology. PCR method: Jones, R.M., Twomey, F., Hannon, S., Errington, J., Pritchard, G.C & Sawyer, J (2010) Detection of Coxiella burnetii in placenta and abortion samples from British ruminants using real-time PCR Veterinary Record 167, 965-967. ELISA: Horigan, M.W., Bell, M.M., Pollard, T.R., Sayers, A.R & Pritchard, G.C. Q fever diagnosis in domestic ruminants: comparison between Complement Fixation and commercial ELISA tests. Journal of Veterinary Diagnostic Investigation.

Vaccination policy

Vaccination for Q fever infection is not generally undertaken in the UK but has been used following abortion storms in specific herds and flocks.

Control program/mechanisms

The control program/strategies in place

Advice to farmers on preventing infection is regularly updated and risks from infection are highlighted annually by the veterinary and public health authroties in the UK. Control of Q fever is aimed primarily at disease surveillance, and also provision of advice on disease control through management and good hygiene measures on farm. Information on Q fever and the updated guidance on measures to avoid infection is available on the Defra, Scottish Government, Welsh Government, Department for Agriculture, Environment and Rural Affairs, Public Health England and Health and Safety Executive websites. (A leaflet, entitled Q fever: information for farmers provides general advice for farmers and others involved with farm livestock, both for their own personal protection and to reduce health risks to the wider population - available at :
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487806/Q_fever_information_for_farmers_2015.pdf)

Notification system in place

Q fever is not notifiable in animals in the UK. In Northern Ireland, Q fever is a designated organism under the Zoonoses Order (NI) 1991. If found during post mortem, the Agri-Food and Biosciences Institute (AFBI) will notify DAERA, and an advisory letter which includes public health advice will be issued to the animal's owner.

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

There were seven incidents (three cattle, one sheep and three goats) of Q fever abortion in England and Wales confirmed in 2015. There were no confirmed diagnoses in Scotland or in Northern Ireland. In six of these incidents, Coxiella burnetii was the sole pathogen identified from the investigation. This contrasts to previous years where concurrent co-infections have been identified more frequently. Of the confirmed cattle incidents, two involved dairy herds in England where single or multiple abortions had been reported. In one of the dairy herds the two cows diagnosed with Coxiella burnetii concurrent mycotic placentitis was also diagnosed. The third cattle incident was identified in a suckler herd in Wales. In sheep, Q fever infection was confirmed as the cause of abortion in one ewe, the second to abort in a smallholding of 17 pedigree sheep in England. All goat incidents occurred in England. The first incident was identified in February, where Q fever was confirmed as the cause of abortion in five dairy goats which had recently been dried off in a milking herd of 800. Coxiella burnetii was the sole abortifacient detected during the investigation. The second (and third using our VIDA diagnostic criteria) incidents involved a newly established goat herd which had sourced animals from multiple farms experienced abortions and maternal deaths affecting 10 out of group of 80 young goats which had arrived on farm a few days earlier. An initial diagnosis of listeriosis explained the early abortions and maternal deaths, but C. burnetii was confirmed as cause of abortion from a second submission in April. Continued abortions prompted a third submission from this farm in June, from which C. burnetii was also detected as a sole pathogen (two incidents of Q fever according to VIDA diagnostic criteria). The final incident of Q fever in goats in 2015 was identified in June, and involved large milking herd, where eight out of a group of 200 lactating does aborted. C. burnetii was the sole abortifacient identified in the investigation. There were four incidents of Q fever reported in 2014, three in 2013, six in 2012, eight in 2011 and five in 2010. These incidents were all reported in England and Wales - there were no recorded incidents of Q fever diagnosis in Northern Ireland or Scotland during this period. Survey: A PCR survey using abortion material collected from randomly selected abortion submissions from farms in England and Wales where Q fever was not suspected was carried out in 2010/2011. During 2010, testing of 192 ovine cotyledons, all from different farms, did not reveal any positives which indicates that prevalence in the sample population is less than 1% (95% confidence). During 2011, C. burnetii was detected in nine (7.3%) of the 124 cattle cotyledons and in one of the nine goat samples. C. burnetii was not detected in any of the pig (4) or alpaca (2) samples tested in the survey. This survey highlighted the potential zoonotic risks of C. burnetii infection for people handing bovine abortion material. (Reference: Pritchard GC; Smith RP; Errington J; Hannon S; Jones RM; Mearns R (2011) Prevalence of Coxiella burnetii in livestock abortion material using PCR. Veterinary Record 169 (15) 391)

2.9 TOXOPLASMA

2.9.1 General evaluation of the national situation

2.9.1.1 Toxoplasma - general evaluation

History of the disease and/or infection in the country

An estimated 350,000 people become infected with Toxoplasma each year in the UK, of which 10-20% are symptomatic. Although the clinical signs are usually mild, infection can be associated with serious sequelae including eye disease and disability. People who are immunocompromised and pregnant women newly infected with Toxoplasma are particularly vulnerable; in the latter, miscarriage, stillbirth and deformities of the child can occur. Tissue cysts are highly infectious for humans and other animals and, in addition to direct transmission from cat faeces or material from aborting sheep, undercooked meat has been identified as an important source of human infection. Toxoplasmosis is only notifiable in humans in Scotland. In the rest of UK, the human cases relate to voluntary laboratory reporting.In animals in the UK, toxoplasmosis is not notifiable or reportable. In animals, surveillance relates to examination of samples received for diagnostic or monitoring reasons at government veterinary laboratories. Isolates from private laboratories are not reported. Toxoplasmosis is endemic in the UK sheep population.

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

Animal Data:Great Britain (England, Scotland and Wales):Toxoplasma gondii was the implicated cause in 23.3% of incidents of fetopathy where a diagnosis was reached in sheep and goats in Great Britain in 2013 (n=907). Toxoplasmosis was the third most common cause of fetopathy in sheep in Great Britain during 2013. This is an increase compared to previous years where Toxoplasma abortion accounted for approximately one fifth of all all incidents of fetopathy in sheep and goats where a diagnosis was made, with 18.5% in 2012, 17.8% in 2011, 22.5% in 2010, 23.1% in 2009, and 22.9% in 2008. During 2013, there were 214 diagnoses of abortion due to toxoplasmosis in sheep and one diagnosis in goats confirmed in Great Britain. The 2013 figures are similar to previous years: 247 recorded diagnoses of abortion due to toxoplasmosis in sheep and one diagnosis in goats in 2012, 145 in sheep and one in goats in 2011, 215 in sheep and one in goats in 2010, 204 in sheep and in one case in goats in 2009 and 201 in sheep with none in goats in 2008. These figures arising from clinical investigations are the number of incidents recorded from 2008 - 2012. An incident is defined as the first diagnosis of a disease from a clinical diagnostic submission from an animal or group of animals on a single premises within a defined period of time.Serological examinations for Toxoplasma gondii using the latex agglutination test (LAT) are undertaken by the Animal Health and Veterinary Laboratories Agency (AHVLA) on sera submitted to regional diagnostic laboratories. During 2013, 528 (65.3%) of 808 sheep sera received (from 216 separate submissions) tested positive for T. gondii. This compares to 444 (51.3%) positive sera from 864 samples (213 submissions) received in 2012. In goats, 32 (50.0%) of 64 sera (17 separate submissions) tested positive. None of the 52 pig sera (two separate submissions) tested positive. Five dog sera (two submissions), one alpaca serum and one deer serum all tested negative. These findings provide a summary of the serological status of samples submitted for diagnosis, monitoring and screening purposes during 2013 but do not constitute a structured survey. Positive samples, as defined here, have LAT titres of 1/64 or greater and indicate a history of exposure to this protozoan parasite.Northern Ireland:Toxoplasma gondii was not diagnosed as a cause of bovine abortion in Northern Ireland in 2013. T. gondii was diagnosed as the cause of ovine abortion in 66 out of 209 cases (19.9%) in which significant pathogens were detected. In 2013, T. Gondii was identified in 26 cattle sera out of a total of 41 samples submitted. In sheep there were 202 positive samples out of a total of 499 sera submissions. These results are similar to 2012 in cattle but slightly lower in sheep : evidence of T. gondii infection was identified in 25 cattle sera samples out of a total of 34 samples submitted during the year. In sheep, there were 455 positive samples out of a total of 533 sera submissions. In 2011, there were 627 sheep sera tested with 283 identified as positive for T gondii. The increase in the identification of cases of T. gondii infection in 2012 is due to the significant increase in the number of samples submitted to AFBI for diagnostic purposes following abortions. This is attributed to the publicity campaign about the perceived risk of introduction of Schmallenberg virus. Positive samples, as defined for this report, have LAT titres of 1/64 or greater and indicate a history of exposure to parasite.United Kingdom - survey in pigs at slaughterhouse:A study to estimate the prevalence of Toxoplasma, as well as other pathogens, in UK pigs at slaughter was carried out in 2013. This was the first UK-wide study of Toxoplasma prevalence in pigs. A total of 620 plasma samples, from 620 pigs were tested for Toxoplasma - after accounting for clustering of pigs within farms, the seroprevalence of Toxoplasma was 7.4% (95% CI 5.3-9.5).

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.

Recent actions taken to control the zoonoses

The Control of Substances Hazardous to Health (COSHH) Regulations 2002 require employers and the self employed to assess risks to health from harmful substances, including micro-organisms, and to take steps to prevent or control those risks, and The Management of Health and Safety at Work Regulations 1999 require employers and the self employed to further assess any risks which affect pregnant women.Updated information on zoonoses and appropriate control measures can be found in HSE Agriculture Information sheet 2 - Common Zoonoses in Agriculture (available at www.HSE.gov.uk/pubns/ais2.pdf). There is also the 1997 publication Infection risks to new and expectant mothers in the workplace - a guide for employers, by the Advisory Committee on Dangerous Pathogens (ref: ISBN 0-7176-1360-7)

2.9.2 Toxoplasma in animals

2.9.2.1 Toxoplasma in animal - Pigs - Survey - national survey

Monitoring system

Sampling strategy

A study to estimate the prevalence of Salmonella, Toxoplasma, Yersinia, Hepatitis E virus (HEV), Porcine Reproductive and Respiratory Syndrome virus (PRRSv) and extended spectrum -lactamase (ESBL) E. coli in UK pigs at slaughter and to investigate antimicrobial resistance (AMR) in Campylobacter coli was carried out in 2013. This was the first UK-wide study of Toxoplasma, HEV, PRRSv and ESBL E. coli in pigs.The study design was consistent, where possible, with the technical specifications for the EU baseline survey for Salmonella in slaughter pigs (Commission Decision 2006/668/EC), with a target sample size of 600 pigs. In anticipation of non-responses or inadequate samples, a further 10% of pigs were scheduled for sampling. The study was carried out at the 14 largest abattoirs of the 169 approved premises in the UK who between them process 80% of pigs slaughtered in the UK. Sampling was weighted so that the number of carcases to sample in each of the selected abattoirs was proportional to the throughput of the abattoir. Overall, 654 pigs were scheduled for sampling during the study period.

Frequency of the sampling

Sampling was scheduled to take place between 14th January 2013 and 12th April 2013. The sampling schedule was randomized so that the day of sampling and the carcase to be sampled on a given day was based on a random selection. The sampling day within each month was randomly chosen from the days the selected slaughterhouse was usually open. The individual carcase to be sampled was randomly chosen from the total number of carcases that the selected slaughterhouse processed daily. The total number of carcases to be sampled was stratified by calendar month.

Type of specimen taken

One blood sample (EDTA plasma), post bleed, along with the whole heart and whole tongue, were taken for testing. Only the blood sample was tested for the purposes of this survey - the heart and tongue tissue from seropositive pigs have been stored for possible future molecular investigations using nucleic acid amplification testing (NAAT).

Methods of sampling (description of sampling techniques)

Samples were collected by trained staff of the Food Standards Agency (FSA) in Great Britain and by the Veterinary Public Health Unit of the Department of Agriculture and Rural Development (DARD) in Northern Ireland. All samples taken were from carcasses deemed fit for consumption by the Competent Authority. The exclusion criteria were as follows: any carcase that was totally condemned; animals with a live weight of less than 50kg; animals that had undergone emergency slaughter; and animals kept in the UK for less than 3 months prior to slaughter were excluded from the study.

Diagnostic/analytical methods used

The Sabin-Feldman Dye Test was used for serodiagnosis (Reiter-Owonaet al., 1999). Any samples that arrived at the testing laboratory more than 96 hours after sample collection were excluded from testing/analysis.

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

Advisory Committee on the Microbiological Safety of Food (ACMSF) (2011). Risk profile in relation to Toxoplasma in the food chain. Available: http://www.food.gov.uk/multimedia/pdfs/consultation/criskproToxoplasmafoodchain.pdf. The seroprevalence of Toxoplasma gondii in this study was 7.4% (95% CI 5.3-9.5). As recognised in the ACMSF Toxoplasma risk profile, previous seroprevalence data for UK-reared pigs is sparse. Nevertheless, this figure is comparable with those published several decades ago in which 4-12% of UK pigs tested positive using the Dye Test (Rawal, 1959; McColm et al., 1981; Jackson et al., 1987) and the estimate also falls within the range of recent seroprevalence estimates from other European countries such as the Netherlands, Ireland, Portugal, Italy and Spain. Seroprevalence had decreased in several European countries from the 1990s due to increasingly intensive management systems, however, as consumer demand for outdoor-reared pork meat is increasing, the prevalence of Toxoplasma may show a parallel increasing trend again due to greater access of pigs to environmental sources of infection. Outdoor farming currently accounts for around 40% of commercial pig breeding herds in the UK. In this survey, only one of the Toxoplasma-positive pigs was recorded as being born outdoors but the information concerning the production system was relatively poorly completed so it was not possible to accurately assess any potential association with seroprevalence. Nevertheless, this survey provides a useful baseline against which to measure future trends in seroprevalence as husbandry practices evolve. Seropositivity in the human population has been found to vary geographically within the UK, with the highest levels thought to be in Northern Ireland and the lowest in England and Scotland; within GB, seropositivity is generally highest in the west (ACMSF 2011). Porcine seroprevalence might also be expected to vary between regions due to differences in local husbandry practices and geographical or climatic features; all factors that may affect oocyst survival and dispersal. However, no clear spatial heterogeneity was identified in these results. In this study, pigs were sampled during January to May hence the possible impact of seasonality should be considered. Most of the pigs sampled in this study would have been born in late summer/ early autumn and this may have a bearing on their exposure and sero-status.

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

It is difficult to gauge the public health implications of the findings for a number of reasons. Firstly, the correlation between seropositivity and the number of viable cysts of T. gondii in edible tissue has not yet been fully elucidated (ACMSF 2011). In addition, the relative contribution of the foodborne route of transmission to the overall human disease burden, as well as the contribution of different food vehicles, is unknown (ACMSF 2011). Thus, whilst the seroprevalence identified in this survey is considerably lower than that found in a recent survey of sheep in Great Britain, in which 74% of animals tested seropositive (Hutchinson et al., 2011), the significance of this difference to UK consumers is unclear. The results of this survey provide a nationally representative baseline seroprevalence against which future survey results and the effectiveness of control measures can be monitored. However, a number of other data gaps remain which will be imperative to explore before the scale of the risk posed by pork and pork products can be accurately inferred.

Additional information

Information on the 2013 slaughterhouse survey of pigs taken from 'Powell et al. (2014) Study of Salmonella, Toxoplasma, Hepatitis E virus, Yersinia, Porcine Reproductive and Respiratory Syndrome virus, antimicrobial resistance in Campylobacter and extended spectrum beta lactamase E. coli in UK pigs at slaughter: OZ0150 final report' (available on Defra website). The project was funded by Defra, the Food Standards Agency, the British Pig Executive, the Veterinary Medicines Directorate, Public Health England and Public Health Wales. We thank Industry for supporting this work and the abattoirs for participating in this study.

3 ANTIMICROBIAL RESISTANCE INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

3.1 SALMONELLOSIS

3.1.1 Salmonella in animals

3.1.1.1 Antimicrobial resistance in Salmonella Poultry, unspecified

Sampling strategy used in monitoring

Frequency of the sampling

In England, Wales and Scotland (Great Britain) all isolations of Salmonella must be reported under the 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 in laying hens and broilers (Gallus gallus) and in turkeys were selected from isolates derived from testing carried out under the Salmonella National Control Programmes in accordance with the EFSA recommendations, SANCO/431/2007 and Decision 2007/407/EC.

Type of specimen taken

As per requirements of the Salmonella National Control Programmes.

Methods of sampling (description of sampling techniques)

In accordance with the Salmonella National Control Programmes.

3.2 ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1 Escherichia coli, non-pathogenic in foodstuffs

3.2.1.1 Antimicrobial resistance in E.coli, non-pathogenic, unspecified

Stratification procedures per animal populations and food categories

2 Stratification procedures as specified in Commission Decision 2013/652/EU and as specified in technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria - straitification accounts for types of retailer and type of meat production.

Randomisation procedures per animal populations and food categories

3 Randomisation procedures as specified in Commission Decision 2013/652/EU and as specified in technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria.

Sampling strategy used in monitoring

Frequency of the sampling

4 Frequency of the sampling as specified in Commission Decision 2013/652/EU and as specified in technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria

Type of specimen taken

5 Sampling in accordance with Commission Decision 2013/652/EU and the technical specifications. 300 samples were taken of fresh retail beef cuts, which included beef steak expensive, beef steak less expensive and other sliced/diced beef. Processed meat, minced meat, joints or meat with added herbs/spices were excluded from the sampling for both beef and pork.

Type of specimen taken

5 Samples were collected in accordance with 2013/652/EU and the technical specifications. For the pork, 300 samples were taken of fresh retail pork cuts, which included pork fillets and steaks, pork chops and other diced/sliced pork. Processed meat, minced meat, joints or meat with added herbs/spices were excluded from the sampling for both beef and pork.

Methods of sampling (description of sampling techniques)

6 The EFSA Technical Specification (2014; 12(5):3686) was used for the sampling design and strategy and was based on market share data. Meat samples were randomly collected from large retailers in UK locations with statistically representative population numbers. Samples were collected quarterly during 1 week per month to ensure an even distribution. The minimum sample size collected was 25g.

Procedures for the selection of isolates for antimicrobial testing

Procedure for selection of samples as specified in Commission Decision 2013/652/EU and the technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria.

Procedures for the selection of isolates for antimicrobial testing

7 Procedure for selection of samples as specified in Commission Decision 2013/652/EU and the technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria.

Methods used for collecting data

Data collected on a form which was submitted to APHA for testing alongside the retail meat sample.

Methods used for collecting data

8 Data collected on a form which was submitted to APHA for testing alongside the retail meat sample.

Laboratory methodology used for identification of the microbial isolates

9 Methodology used was as per the guidance in the EURL AMR laboratory protocol for the isolation of ESBL, AmpC, and carbapanemase producing E. coli from fresh meat http://www.eurl-ar.eu/data/images/protocols/esbl_ampc_cpeprotocol_version_meat_october2015_version3.pdf

Laboratory used for detection for resistance

Antimicrobials included in monitoring

10 Antimicrobials and media used as provided in Commission Decision 2013/652/EU

Cut-off values used in testing

11 CUT-OFF values used as specified in Commission Decision 2013/652/EU

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

17 Evaluation of relevance not available at this time.

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

16 Evaluation not available at this time.

Results of the investigation

15 Analysis of results not available at this time.

Notification system in place

14 Notification system not applicable to this survey

Measures in case of the positive findings or single cases

13 Not applicable to this survey

Control program/mechanisms

The control program/strategies in place

12 A specific sampling survey was implemented to provide these retail meat samples

The control program/strategies in place

11 CUT-OFF values used as specified in Commission Decision 2013/652/EU

Additional information

18 Aswell as being plated onto the agars as specified in the EURL protocol samples were also plated onto ESBL Brilliance agar - the results of this non-mandatory monitoring are reported in the UK dataset for 2015.

Additional information

18 Aswell as being plated onto the agars as specified in the EURL protocol samples (MacConkey + 1 mg/L cefotaxime and CHROMID Carba and CHROMID OXA-48) were also plated onto OXOID ESBL Brilliance agar - the results of this non-mandatory monitoring are reported in the UK dataset for 2015.

3.2.1.2 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Meat from bovine animals

Description of sampling designs

1 Sampling design as specified in Commission Decision 2013/652/EU and as specified in technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria - at retail outlets with proportional allocation of the number of samples to the population of the geographical region (NUTS-3 area) accounting for at least 80 % of the national population.

3.2.1.3 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Meat from pig

Description of sampling designs

1 Sampling design as specified in Commission Decision 2013/652/EU and as specified in technical specifications on randomised sampling for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria - at retail outlets with proportional allocation of the number of samples to the population of the geographical region (NUTS-3 area) accounting for at least 80 % of the national population.

3.2.2 Escherichia coli, non-pathogenic in animals

3.2.2.1 Antimicrobial resistance in E.coli, non-pathogenic, unspecified

Stratification procedures per animal populations and food categories

2 Stratification procedures as specified in Commission Decision 2013/652/EU. Sampling was stratified by abattoir throughput at slaughterhouses in GB and NI representing over 60% of UK throughput.

Randomisation procedures per animal populations and food categories

3 Randomisation procedures as specified in Commission Decision 2013/652/EU. Random selection of sampling days in each month, and batches to be sampled on any given day.

Sampling strategy used in monitoring

Frequency of the sampling

4 Frequency of sampling as defined in Commission Decision 2013/652/EU. Approximately 381 samples were collected evenly throughput 2015.

Type of specimen taken

5 Sample taken as specified in Commission Decision 2013/652/EU - 25g of caecal content sample taken at the point of evisceration.

Methods of sampling (description of sampling techniques)

6 Sampling technique as specified in Commission Decision 2013/652/EU. 25g of caecal content sample collected at the point of evisceration.

Procedures for the selection of isolates for antimicrobial testing

7 Randomisation as specified in Commission Decision 2013/652/EU. Only one isolate taken forward at random from each holding - duplicate samples were exempt from being taken forward for analysis.

Methods used for collecting data

8 Background data on samples was inputted by FSA staff when collecting samples. This was done via an 'AMR2 Form' which captured data on the holding of origin, confirmation that the sample was from a fattening pig, date of sampling, etc.

Laboratory methodology used for identification of the microbial isolates

9 E. coli are isolated from caecal contents following EURL methods. Briefly, 1 gram of caecal contents is added to 9 mls of Buffered Peptone Water (BPW), the sample mixed, and 10 l plated to MacConkey agar which is incubated at 44C. For selective isolation of antimicrobial resistant isolates, sample and BPW is incubated overnight at 37C before plating 10 l to suitable selective agars such as MacConkey agar + 1 mg/L cefotaxime and CHROMagar ESBL (for isolation of ESBLs), CHROMID carba and CHROMID OXA-48 (for isolation of carbapenem resistant isolates). Presumptive E. coli are confirmed as such using suitable tests.

Laboratory methodology used for identification of the microbial isolates

9 Identification of isolates was as per the EURL AMR protocol on the isolation of ESBL, AmpC and carbapenemase producing E. coli from caecal samples. http://www.crl-ar.eu/data/images/protocols/esbl_ampc_cpeprotocol_version_caecal_dec2014_version2.pdf

Laboratory used for detection for resistance

Antimicrobials included in monitoring

10 Antimicrobials used in the monitoring as specified in 2013/652/EU. ESBL testing in accordance with the AMR EURL laboratory protocol on the Isolation of ESBL, AmpC and carbapenemase producing E. coli from caecal samples.

Antimicrobials included in monitoring

10 Antimicrobials included in the monitoring as in Commission Decision 2013/652/EU

Cut-off values used in testing

11 CUTOFFs included in the monitoring as specified in Commission Decision 2013/652/EU

Cut-off values used in testing

11 CUT-OFF values as specified in Commission Decision 2013/652/EU

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

17 Relevance of findings not available at this time.

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

16 Evaluation of results of the investigation not available at this time.

Results of the investigation

15 Interpretation of results of the investigation not available at this time.

Notification system in place

14 Notification system not applicable

Measures in case of the positive findings or single cases

13 Measures in the case of positive findings not applicable.

Control program/mechanisms

The control program/strategies in place

12 No control programmes/strategies in place. A new pig survey was implemented to acquire the caecal samples for this EU monitoring

Additional information

18 No additional information

Additional information

18 Aswell as being plated onto the agars as specified in the EURL protocol (MacConkey + 1 mg/L cefotaxime and CHROMID Carba and CHROMID OXA-48) samples were also plated onto ESBL Brilliance agar - the results of this non-mandatory monitoring on ESBL Brilliance agar are reported to EFSA. Three-hunded samples were also plated onto CHROMID Carba [TotUnitsTested] = 300] using the EURL AMR laboratory protocol. No ne of these samples were positive for carbapenemase producers [TotUnitsPositive=0].

3.2.2.2 Antimicrobial resistance in E.coli, non-pathogenic, unspecified Pigs

Description of sampling designs

1 Sampling designs as specified in Commission Decision 2013/652/EU. Random sampling plan stratified by slaughter throughput - sampled at slaughterhouses in GB and NI representing over 60% of UK throughput. Sample collection distributed evenly over each month of the year. One caecal sample per epidemiological unit (holding) taken forward for AMR testing. Samples taken on random days within the month. Samples arrived at laboratory for processing within 24 hours of collection.

ANIMAL POPULATION TABLES

Table Susceptible animal population

Animal species	Category of animals	Population		
		holding	animal	herd/flock
Cattle (bovine animals)	Cattle (bovine animals)	98,652	9,918,569	
Deer	Deer - farmed		30,687	
Gallus gallus (fowl)	Gallus gallus (fowl) - breeding flocks, unspecified - adult		12,510,968	1,725
	Gallus gallus (fowl) - broilers		107,055,604	44,082
	Gallus gallus (fowl) - laying hens		36,998,025	4,056
Goats	Goats		100,700	
Pigs	Pigs	37,750	4,739,123	
Sheep	Sheep		33,336,590	
Sheep and goats	Sheep and goats			140,647
Solipeds, domestic	Solipeds, domestic - horses		282,786	
Turkeys	Turkeys		4,322,167	
	Turkeys - breeding flocks, unspecified - adult			257
	Turkeys - fattening flocks			3,057

DISEASE STATUS TABLES

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

Region	Total number of animals	Number of animals to be tested under the program	Number of animals tested	Number of animals tested individually	Number of positive animals	Number of positive animals slaughtered	Total number of animals slaughtered
Northern Ireland (NUTS level 2)	1,608,851	919,853	732,716	584,988	0	0	0

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

Region	Number of new positive herds	Number of depopulated herds	Total number of herds	Number of herds under the program	Number of herds under the program tested/checked	Number of positive herds
UNITED KINGDOM	0		24,539	24,539	18,387	0
Northern Ireland (NUTS level 2)	0	0	24,539	18,387	18,387	0

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

Region	Number of herds with unknown status, at the end of the period	Number of herds with status not free or not officially free and last check positive, at the end of the period	Number of herds with status not free or not officially free and last check negative, at the end of the period	Number of herds with status free or officially free suspended, at the end of the period	Number of herds with status free, at the end of the period	Number of herds with status officially free, at the end of the period
Northern Ireland (NUTS level 2)	0	0	0	21	0	24,518

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

Region	Number of animals serologically tested under investigations of suspect cases	Number of herds with status officially free	Number of infected herds	Total number of herds	Number of herds tested under surveillance by bulk milk	Number of animals or pools tested under surveillance by bulk milk	Number of notified abortions whatever cause	Number of animals tested by microbiology under investigations of suspect cases
UNITED KINGDOM	7,631	76,077	0	76,077	9,096	38,895	4,870	2,761
NORTH EAST (ENGLAND)		51,232	0	51,232				
NORTH WEST (ENGLAND)		51,232	0	51,232				
YORKSHIRE AND THE HUMBER		51,232	0	51,232				
EAST MIDLANDS (ENGLAND)		51,232	0	51,232				
WEST MIDLANDS (ENGLAND)		51,232	0	51,232				
EAST OF ENGLAND		51,232	0	51,232				
LONDON		51,232	0	51,232				
SOUTH EAST (ENGLAND)		51,232	0	51,232				
SOUTH WEST (ENGLAND)		51,232	0	51,232				
WALES		11,669	0	11,669				
SCOTLAND (NUTS level 1)		13,176	0	13,176				

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

Region	Number of herds with status officially free	Number of infected herds	Total number of herds
UNITED KINGDOM	140,647	0	140,647

DISEASE STATUS TABLES

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

Region	Total number of animals	Number of animals to be tested under the program	Number of animals tested	Number of animals tested individually	Number of positive animals	Number of positive animals slaughtered	Total number of animals slaughtered
NORTH EAST (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
NORTH WEST (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
YORKSHIRE AND THE HUMBER	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
EAST MIDLANDS (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
WEST MIDLANDS (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
EAST OF ENGLAND	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
LONDON	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
SOUTH EAST (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
SOUTH WEST (ENGLAND)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033
WALES	1,220,554	1,220,554	1,220,554	1,220,554	7,568	8,103	8,103
Northern Ireland (NUTS level 2)	1,662,526	1,662,526	1,662,526	1,662,526	10,996	10,996	12,355
Extra-Regio NUTS 1 (UNITED KINGDOM)	5,384,753	4,146,712	4,146,712	4,146,712	27,381	28,033	28,033

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

Region	Number of new positive herds	Number of depopulated herds	Total number of herds	Number of herds under the program	Number of herds under the program tested/checked	Number of positive herds
UNITED KINGDOM	6,479		87,440	87,440	70,186	9,628
NORTH EAST (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158
NORTH WEST (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158
YORKSHIRE AND THE HUMBER	3,954	3	51,232	51,232	34,783	6,158
EAST MIDLANDS (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158
WEST MIDLANDS (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158
EAST OF ENGLAND	3,954	3	51,232	51,232	34,783	6,158
LONDON	3,954	3	51,232	51,232	34,783	6,158
SOUTH EAST (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158
SOUTH WEST (ENGLAND)	3,954	3	51,232	51,232	34,783	6,158

Region	Number of new positive herds	Number of depopulated herds	Total number of herds	Number of herds under the program	Number of herds under the program tested/checked	Number of positive herds
WALES	837	1	11,669	11,669	11,125	1,375
Northern Ireland (NUTS level 2)	1,688	12	24,539	24,539	24,278	2,095
Extra-Regio NUTS 1 (UNITED KINGDOM)	3,954	3		51,232	34,783	6,158

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

Region	Total number of herds under the program, at the end of the period	Total number of animals under the program, at the end of the period	Number of herds with unknown status, at the end of the period	Number of animals with unknown status, at the end of the period	Number of herds with status not free or not officially free and last check positive, at the end of the period	Number of animals with status not free or not officially free and last check positive, at the end of the period	Number of herds with status not free or not officially free and last check negative, at the end of the period	Number of herds with status free or officially free suspended, at the end of the period	Number of animals with status free or officially free suspended, at the end of the period	Number of herds with status free, at the end of the period	Number of herds with status officially free, at the end of the period	Number of animals with status officially free, at the end of the period
NORTH EAST (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
NORTH WEST (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
YORKSHIRE AND THE HUMBER	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
EAST MIDLANDS (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
WEST MIDLANDS (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
EAST OF ENGLAND	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
LONDON	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
SOUTH EAST (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
SOUTH WEST (ENGLAND)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820
WALES	11,669	1,118,979		0	485	106,555		479	58,193		10,705	954,232
Northern Ireland (NUTS level 2)			0		610		1,011	1,372		0	21,546	
Extra-Regio NUTS 1 (UNITED KINGDOM)	51,232	5,384,753		0	2,135	666,000		2,134	372,933		46,963	4,345,820

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

Region	Number of herds with status officially free	Number of infected herds	Total number of animals	Interval between routine tuberculin tests	Number of animals tested with tuberculin routine 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	Total number of herds
UNITED KINGDOM	13,174	2							13,176
SCOTLAND (NUTS level 1)	13,174	2	1,713,027	48	265,800	2,320	11	5	13,176

PREVALENCE TABLES

Table BRUCELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Buffalos - Unspecified - Not Available - animal sample - blood - Surveillance - Industry sampling - Selective sampling	animal	5	0	Brucella	0
	Cattle (bovine animals) - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	14560	0	Brucella	0
	Sheep and goats - Farm - Not Available - Not Available - Monitoring - EFSA specifications - Not applicable - Census	animal	11277	0	Brucella melitensis	0

Table CAMPYLOBACTER in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cats - Veterinary clinics - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	30	30	Campylobacter	30
	Cattle (bovine animals) - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	58	58	Campylobacter	58
	Dogs - pet animals - Unspecified - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Campylobacter, unspecified sp.	1
	Dogs - Veterinary clinics - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	158	158	Campylobacter	158
	Gallus gallus (fowl) - broilers - Slaughterhouse - United Kingdom - animal sample - caecum - Monitoring - Official sampling - Objective sampling	slaughter animal batch	501	350	Campylobacter coli	81
					Campylobacter jejuni	269
	Gallus gallus (fowl) - broilers - Slaughterhouse - United Kingdom - food sample - neck skin - Monitoring - Official sampling - Objective sampling	slaughter animal batch	501	354	Campylobacter coli	55
					Campylobacter jejuni	299
	Goats - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Campylobacter, unspecified sp.	1
	Goats - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	1	1	Campylobacter	1
	Other animals - Veterinary clinics - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	7	7	Campylobacter	7
	Pigs - Farm - Not Available - animal sample - caecum - Surveillance - Official sampling - Suspect sampling	animal	5	5	Campylobacter jejuni	2
					Campylobacter, unspecified sp.	3
	Pigs - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Campylobacter, unspecified sp.	1
	Poultry, unspecified - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	2	2	Campylobacter	2
	Sheep - Farm - Not Available - animal sample - caecum - Surveillance - Official sampling - Suspect sampling	animal	7	7	Campylobacter jejuni	2
					Campylobacter, unspecified sp.	5
	Sheep - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Campylobacter jejuni	1
	Sheep - Farm - Not Available - animal sample - foetus/stillbirth - Surveillance - Official sampling - Suspect sampling	animal	8	8	Campylobacter fetus subsp. fetus	3
					Campylobacter jejuni	1
					Campylobacter lari	1
					Campylobacter, unspecified sp.	3
	Sheep - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	186	186	Campylobacter	186

Table CAMPYLOBACTER in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Meat from broilers (Gallus gallus) - fresh - chilled - Retail - Not Available - food sample - meat - Monitoring - Official sampling - Objective sampling	single (food/feed)	25	Gram	2525	1721	Campylobacter coli	28
							Campylobacter jejuni	313
							Campylobacter, unspecified sp.	1,380

Table COXIELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	N of clinical affected herds	Zoonoses		N of units positive
Not Available	Cattle (bovine animals) - Farm - United Kingdom - animal sample - Clinical investigations - Industry sampling - Suspect sampling	animal	11	11			Coxiella	11
	Goats - Farm - United Kingdom - animal sample - Clinical investigations - Industry sampling - Suspect sampling	animal	1	1			Coxiella	1
	Sheep - Farm - United Kingdom - animal sample - Clinical investigations - Industry sampling - Suspect sampling	animal	5	5			Coxiella	5

Table ECHINOCOCCUS in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Foxes - wild - Natural habitat - Not Available - animal sample - faeces - Survey - national survey - Official sampling - Convenient sampling	animal	691	0	Echinococcus granulosus complex	0
					Echinococcus multilocularis	0

Table ESCHERICHIA COLI in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	77	14	VTEC O157	14
	Goats - Farm - Not Available - animal sample - faeces - Surveillance - Industry sampling - Not specified	animal	4	0	VTEC O157	0
	Sheep - animals over 1 year - Farm - Not Available - animal sample - faeces - Surveillance - Industry sampling - Not specified	animal	3	0	VTEC O157	0

Table ESCHERICHIA COLI in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cheeses, made from unspecified milk or other animal milk - unspecified - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	6	0	Verocytotoxigenic E. coli (VTEC)	0
	Cheeses, made from unspecified milk or other animal milk - unspecified - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	100	0	Verocytotoxigenic E. coli (VTEC)	0
	Seeds, sprouted - ready-to-eat - Processing plant - Unknown - food sample - Monitoring - Official sampling - Objective sampling	single (food/feed)	25	Gram	6	0	Verocytotoxigenic E. coli (VTEC)	0
	Seeds, sprouted - ready-to-eat - Retail - Unknown - food sample - Monitoring - Official sampling - Objective sampling	single (food/feed)	25	Gram	8	0	Verocytotoxigenic E. coli (VTEC)	0

Table FLAVIVIRUS in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
UNITED KINGDOM	Birds - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - active - Official sampling - Suspect sampling	animal	336	0	West Nile virus	0
	Solipeds, domestic - horses - Farm - United Kingdom - animal sample - blood - Clinical investigations - Not applicable - Suspect sampling	animal	2	0	West Nile virus	0
	Solipeds, domestic - horses - Farm - Unknown - animal sample - blood - Clinical investigations - Not applicable - Suspect sampling	animal	3	0	West Nile virus	0

Table LISTERIA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Alpacas - Farm - Not Available - animal sample - Clinical investigations - Not applicable - Suspect sampling	animal	1	1	Listeria	1
	Cattle (bovine animals) - Farm - Not Available - animal sample - Clinical investigations - Not applicable - Suspect sampling	animal	31	31	Listeria	31
	Cattle (bovine animals) - Farm - Not Available - animal sample - foetus/stillbirth - Surveillance - Official sampling - Suspect sampling	animal	4	4	Listeria monocytogenes	4
	Cattle (bovine animals) - Farm - Not Available - animal sample - organ/tissue - Surveillance - Official sampling - Suspect sampling	animal	6	6	Listeria monocytogenes	6
	Goats - Farm - Not Available - animal sample - Clinical investigations - Not applicable - Suspect sampling	animal	2	2	Listeria	2
	Sheep - Farm - Not Available - animal sample - Clinical investigations - Not applicable - Suspect sampling	animal	87	87	Listeria	87
	Sheep - Farm - Not Available - animal sample - foetus/stillbirth - Surveillance - Official sampling - Suspect sampling	animal	10	10	Listeria ivanovii	1
					Listeria monocytogenes	9
	Sheep - Farm - Not Available - animal sample - organ/tissue - Surveillance - Official sampling - Suspect sampling	animal	4	4	Listeria monocytogenes	4

Table LISTERIA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Method	Zoonoses	N of units tested	N of units positive
Not Available	Cheeses, made from unspecified milk or other animal milk - unspecified - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	793	45	<= 100	Listeria monocytogenes, unspecified	793	1
							>100	Listeria monocytogenes, unspecified	793	5
	Cheeses, made from unspecified milk or other animal milk - unspecified - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	793	45	Not Available	Listeria monocytogenes, unspecified	793	45
	Other processed food products and prepared dishes - sandwiches - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	2867	84	<= 100	Listeria monocytogenes, unspecified	2,867	9
							>100	Listeria monocytogenes, unspecified	2,867	3
	Other processed food products and prepared dishes - sandwiches - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	2867	84	Not Available	Listeria monocytogenes, unspecified	2,867	84

Table LYSSAVIRUS in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Bats - wild - Natural habitat - United Kingdom - animal sample - Monitoring - Official sampling - Suspect sampling	animal	31	1	European bat lyssavirus 2	1
	Bats - zoo animal - Zoo - United Kingdom - animal sample - Surveillance - Official sampling - Not specified	animal	27	0	Lyssavirus	0
	Cats - Unspecified - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	2	0	Rabies virus	0
	Dogs - Unspecified - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	6	0	Rabies virus	0
	Rabbits - Unspecified - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	1	0	Rabies virus	0

Table MYCOBACTERIUM in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Alpacas - farmed - Farm - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	132	35	Mycobacterium bovis	35
	Badgers - wild - Unspecified - Not Available - animal sample - Surveillance - Not applicable - Not specified	animal	339	48	Mycobacterium bovis	48
	Cats - pet animals - Veterinary clinics - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	231	34	Mycobacterium bovis	34
	Deer - farmed - Slaughterhouse - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	24	14	Mycobacterium bovis	14
	Deer - Unspecified - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	1	1	Mycobacterium bovis	1
	Deer - wild - Natural habitat - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	21	12	Mycobacterium bovis	12
	Dogs - pet animals - Veterinary clinics - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	6	0	Mycobacterium bovis	0
	Ferrets - Veterinary clinics - Not Available - Not Available - Clinical investigations - Official sampling - Suspect sampling	animal	2	0	Mycobacterium bovis	0
	Goats - Unspecified - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	2	0	Mycobacterium bovis	0
	Lamas - Unspecified - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	20	2	Mycobacterium bovis	2
	Pigs - Slaughterhouse - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	74	19	Mycobacterium bovis	19
	Pigs - Unspecified - Not Available - animal sample - Surveillance - Not applicable - Not specified	animal	1	1	Mycobacterium bovis	1
	Rabbits - wild - Natural habitat - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	1	0	Mycobacterium bovis	0
	Sheep - Unspecified - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	12	7	Mycobacterium bovis	7
	Wild boars - wild - Natural habitat - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	16	14	Mycobacterium bovis	14
	Zoo animals, all - Zoo - Not Available - Not Available - Surveillance - Official sampling - Suspect sampling	animal	19	9	Mycobacterium bovis	9

Table SALMONELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Birds - wild - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	3	3	Salmonella Kedougou	1
							Salmonella Not typeable	1
							Salmonella Typhimurium DT 193	1
	Cattle (bovine animals) - adult cattle over 2 years - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	4	4	Salmonella Dublin	4
	Cattle (bovine animals) - calves (under 1 year) - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	26	26	Salmonella Dublin	25
							Salmonella spp., unspecified	1
	Cattle (bovine animals) - Farm - Not Available - animal sample - faeces - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	15	15	Salmonella Bredeney	1
							Salmonella Dublin	9
							Salmonella Enteritidis PT 21	1
							Salmonella spp., unspecified	1
							Salmonella Typhimurium DT 120	1
							Salmonella Typhimurium RDNC	1
							Salmonella Typhimurium, monophasic - DT 193	1
	Cattle (bovine animals) - Farm - Not Available - animal sample - foetus/stillbirth - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	23	23	Salmonella Dublin	22
							Salmonella Montevideo	1
	Cattle (bovine animals) - Farm - Not Available - animal sample - placental swab - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	1	1	Salmonella spp., unspecified	1
	Cattle (bovine animals) - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	381	381	Salmonella 1,4,12:i:-	4
							Salmonella 1,4,5,12:i:-	6
							Salmonella Agama	7
							Salmonella Ajiobo	1
							Salmonella Anatum	5
							Salmonella Braenderup	1
							Salmonella Butantan	6
							Salmonella Coeln	2
							Salmonella Dublin	238
							Salmonella enterica subsp. enterica rough	2
							Salmonella Enteritidis	2
							Salmonella IIIb 61:-:1,5	2
							Salmonella IIIb 61:-:1,5,7	2
							Salmonella IIIb 61:k:1,5,7	1
							Salmonella Kedougou	2
							Salmonella Kentucky	1
							Salmonella Kingston	1
							Salmonella Kottbus	2
							Salmonella Mbandaka	54
							Salmonella Montevideo	15
							Salmonella Muenster	1
							Salmonella Newport	5

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cattle (bovine animals) - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	381	381	Salmonella Not typeable	2
							Salmonella Oslo	1
							Salmonella Othmarschen	1
							Salmonella Typhimurium DT 1	1
							Salmonella Typhimurium DT 104	6
							Salmonella Typhimurium DT 193	1
							Salmonella Typhimurium Not typable	7
							Salmonella Typhimurium U 302	2
	Cattle (bovine animals) - unspecified - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	1	1	Salmonella Dublin	1
	Ducks - Farm - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N_A	310	310	Salmonella Ajiobo	1
							Salmonella Anatum	1
							Salmonella Bovismorbificans	10
							Salmonella Bredeney	1
							Salmonella enterica subsp. enterica rough	7
							Salmonella Enteritidis	1
							Salmonella Enteritidis PT 9b	4
							Salmonella Give	64
							Salmonella Hadar	24
							Salmonella Indiana	110
							Salmonella Infantis	1
							Salmonella Kedougou	1
							Salmonella Kottbus	4
							Salmonella Mbandaka	10
							Salmonella Monschaui	4
							Salmonella Not typeable	9
							Salmonella Orion	53
							Salmonella Senftenberg	1
							Salmonella Typhimurium DT 8	2
							Salmonella Typhimurium DT 9	1
							Salmonella Virchow	1
	Gallus gallus (fowl) - breeding flocks for broiler production line - Hatchery - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	1	1	Salmonella Montevideo	1
	Gallus gallus (fowl) - breeding flocks, unspecified - adult - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	1361	Y	1361	6	Salmonella 1,13,23:i:-	1
							Salmonella Agona	3
							Salmonella Indiana	1
							Salmonella Senftenberg	1
	Gallus gallus (fowl) - broilers - before slaughter - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	36043	Y	36043	557	Salmonella 1,13,23:i:-	60
							Salmonella 1,4,12:d:-	1
							Salmonella 1,4,12:i:-	1
							Salmonella 6,7:-:-	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Gallus gallus (fowl) - broilers - before slaughter - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	36043	Y	36043	557	Salmonella 6,7:z10:-	11
							Salmonella Agama	1
							Salmonella Agona	2
							Salmonella Braenderup	1
							Salmonella enterica subsp. enterica rough	6
							Salmonella Enteritidis	1
							Salmonella Enteritidis Other	1
							Salmonella Enteritidis PT 21	44
							Salmonella Enteritidis PT 35	1
							Salmonella Enteritidis PT 6a	3
							Salmonella Give	1
							Salmonella Goldcoast	3
							Salmonella Idikan	3
							Salmonella Indiana	22
							Salmonella Kedougou	122
							Salmonella Kottbus	1
							Salmonella Livingstone	4
							Salmonella Mbandaka	211
							Salmonella Montevideo	19
							Salmonella Newport	3
							Salmonella Ohio	25
							Salmonella Orion	2
							Salmonella Senftenberg	14
							Salmonella Typhimurium DT 41	1
				Y	8048	97	Salmonella Dublin	4
							Salmonella enterica, subspecies diarizonae	1
							Salmonella Enteritidis PT 21	8
							Salmonella Goldcoast	1
							Salmonella Kottbus	1
							Salmonella Mbandaka	26
							Salmonella Montevideo	1
							Salmonella Muenster	31
							Salmonella Schwarzengrund	1
							Salmonella Senftenberg	8
							Salmonella spp., unspecified	3
							Salmonella Tennessee	7
							Salmonella Typhimurium DT 104b	1
							Salmonella Typhimurium DT 120	1
							Salmonella Typhimurium DT 193	1
							Salmonella Typhimurium DT RDNC	2

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Gallus gallus (fowl) - broilers - Hatchery - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	198	198	Salmonella 1,13,23:i:-	123
							Salmonella 6,7:z10:-	3
							Salmonella enterica subsp. enterica rough	2
							Salmonella Enteritidis PT 1	1
							Salmonella Enteritidis PT 21	10
							Salmonella Idikan	4
							Salmonella Indiana	2
							Salmonella Javiana	2
							Salmonella Livingstone	5
							Salmonella Mbandaka	31
							Salmonella Montevideo	4
							Salmonella Senftenberg	11
	Gallus gallus (fowl) - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N	1	1	Salmonella Gallinarum biovar Pullorum	1
	Gallus gallus (fowl) - laying hens - adult - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	3674	Y	3674	22	Salmonella 1,13,23:i:-	1
							Salmonella 1,4,12:i:-	1
							Salmonella Agama	5
							Salmonella Agona	1
							Salmonella Ajiobo	1
							Salmonella Anatum	1
							Salmonella Coeln	1
							Salmonella Dublin	1
							Salmonella I, group O:1,3,19	1
							Salmonella Indiana	1
							Salmonella Kedougou	2
							Salmonella Kingston	1
							Salmonella Mbandaka	3
							Salmonella Montevideo	1
							Salmonella Schwarzengrund	1
				Y	382	5	Salmonella Enteritidis	1
							Salmonella Mbandaka	1
							Salmonella spp., unspecified	1
							Salmonella Typhimurium DT 193	1
							Salmonella Typhimurium DT RDNC	1
	Gallus gallus (fowl) - laying hens - Farm - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	1	1	Salmonella Durham	1
	Gallus gallus (fowl) - laying hens - Hatchery - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	36	36	Salmonella Senftenberg	35
							Salmonella Typhimurium DT 193	1
	Gallus gallus (fowl) - laying hens - Packing centre - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	1	1	Salmonella Livingstone	1
	Gallus gallus (fowl) - parent breeding flocks for broiler production line - adult - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock		Y	364	2	Salmonella Enteritidis PT 21	1
							Salmonella Muenster	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Gallus gallus (fowl) - parent breeding flocks for broiler production line - hatching eggs - Hatchery - Not Available - environmental sample - hatcher basket liner - Clinical investigations - Industry sampling - Suspect sampling	herd/flock		N_A	74	74	Salmonella Enteritidis PT 21	2
							Salmonella Mbandaka	37
							Salmonella Muenster	33
							Salmonella Schwarzengrund	1
							Salmonella Tennessee	1
	Guinea fowl - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N_A	1	1	Salmonella Indiana	1
	Gulls - wild - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	1	1	Salmonella Typhimurium DT 208	1
	Hedgehogs - wild - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	2	2	Salmonella Enteritidis 11	2
	Partridges - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N_A	6	6	Salmonella Derby	1
							Salmonella Orion	2
							Salmonella Senftenberg	1
							Salmonella Typhimurium DT 8	2
	Pheasants - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N_A	34	34	Salmonella enterica subsp. enterica rough	1
							Salmonella Gallinarum biovar Pullorum	2
							Salmonella Give	1
							Salmonella Indiana	1
							Salmonella Orion	10
							Salmonella Senftenberg	1
							Salmonella Tennessee	1
							Salmonella Typhimurium DT 1	4
							Salmonella Typhimurium DT 193	1
							Salmonella Typhimurium DT 40	6
							Salmonella Typhimurium DT 8	4
							Salmonella Typhimurium Not typable	2
	Pigeons - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N_A	23	23	Salmonella Typhimurium DT 2	19
							Salmonella Typhimurium DT 99	4
	Pigs - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	145	145	Salmonella 1,4,12:i:-	49
							Salmonella 1,4,5,12:i:-	39
							Salmonella Bovismorbificans	2
							Salmonella Derby	7
							Salmonella Kedougou	1
							Salmonella London	3
							Salmonella Newport	1
							Salmonella Reading	1
							Salmonella Typhimurium DT 104	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Pigs - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	145	145	Salmonella Typhimurium DT 193	7
							Salmonella Typhimurium DT 195	1
							Salmonella Typhimurium Not typable	3
							Salmonella Typhimurium U 288	22
							Salmonella Typhimurium U 302	6
							Salmonella Typhimurium U 308	2
	Pigs - unspecified - Farm - Not Available - animal sample - faeces - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	2	2	Salmonella Typhimurium DT 104	1
							Salmonella Typhimurium DT 104b	1
	Pigs - unspecified - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	11	11	Salmonella Derby	1
							Salmonella Dublin	1
							Salmonella spp., unspecified	1
							Salmonella Typhimurium	1
							Salmonella Typhimurium PT 193	2
							Salmonella Typhimurium RDNC	1
							Salmonella Typhimurium, monophasic - DT 193	4
	Quails - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	herd/flock		N_A	4	4	Salmonella Infantis	1
							Salmonella Typhimurium DT 104	3
	Seals - wild - Unspecified - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	1	1	Salmonella Bovismorbificans	1
	Sheep - animals over 1 year - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	5	5	Salmonella Dublin	1
							Salmonella enterica, subspecies diarizonae	1
							Salmonella spp., unspecified	3
	Sheep - Farm - Not Available - animal sample - faeces - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	2	2	Salmonella enterica, subspecies diarizonae	1
							Salmonella spp., unspecified	1
	Sheep - Farm - Not Available - animal sample - foetus/stillbirth - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	3	3	Salmonella Dublin	2
							Salmonella spp., unspecified	1
	Sheep - Farm - Not Available - animal sample - organ/tissue - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	1	1	Salmonella Dublin	1
	Sheep - Farm - Not Available - Not Available - Clinical investigations - Industry sampling - Suspect sampling	animal		N_A	1	1	Salmonella enterica, subspecies diarizonae	1
	Sheep - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	66	66	Salmonella 1,4,12:i:-	2
							Salmonella 1,4,5,12:i:-	1
							Salmonella Agama	2
							Salmonella Dublin	7
							Salmonella IIIb 61:-:1,5	9
							Salmonella IIIb 61:-:1,5,7	8
							Salmonella IIIb 61:k:1,5,(7)	2

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	N of flocks under control programme	Target verification	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Sheep - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	66	66	Salmonella IIIb 61:k:1,5,7	24
							Salmonella Indiana	1
							Salmonella Montevideo	8
							Salmonella Newport	2
	Solipeds, domestic - horses - Farm - United Kingdom - animal sample - Clinical investigations - Not applicable - Not specified	animal		N	47	47	Salmonella 1,4,12:i:-	3
							Salmonella 1,4,5,12:i:-	5
							Salmonella Agama	3
							Salmonella Anatum	2
							Salmonella Ank	2
							Salmonella Enteritidis	1
							Salmonella Enteritidis 1	1
							Salmonella Enteritidis 8	2
							Salmonella Enteritidis PT 33	1
							Salmonella Enteritidis PT 9a	3
							Salmonella Montevideo	1
							Salmonella Newport	5
							Salmonella Not typeable	1
							Salmonella Typhimurium	17
	Turkeys - breeding flocks, unspecified - adult - Farm - United Kingdom - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	245	Y	245	5	Salmonella Derby	4
							Salmonella Dublin	1
	Turkeys - fattening flocks - before slaughter - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	439	Y	439	2	Salmonella Dublin	1
							Salmonella Schwarzengrund	1
	Turkeys - fattening flocks - before slaughter - Farm - United Kingdom - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	2618	Y	2618	267	Salmonella 1,4,5,12:i:-	7
							Salmonella Bovismorbificans	1
							Salmonella Derby	209
							Salmonella enterica subsp. enterica rough	6
							Salmonella Enteritidis PT 21	1
							Salmonella Kedougou	36
							Salmonella Kottbus	4
							Salmonella Newport	6
							Salmonella Senftenberg	1
	Turkeys - meat production flocks - Hatchery - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	15	15	Salmonella 6,7:-:-	9
							Salmonella Senftenberg	6
	Turkeys - parent breeding flocks - adult - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	11	Y	11	0	Salmonella	0
	Turkeys - parent breeding flocks - Farm - Not Available - Not Available - Control and eradication programmes - Official and industry sampling - Census	herd/flock	245	Y	245	5	Salmonella Derby	4
							Salmonella Dublin	1
	Turkeys - parent breeding flocks - Hatchery - United Kingdom - animal sample - Surveillance - Not applicable - Not specified	herd/flock		N	7	7	Salmonella Senftenberg	7

Table SALMONELLA in food

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Cheeses, made from unspecified milk or other animal milk - unspecified - Retail - Unknown - food sample - Survey - Official sampling - Objective sampling	single (food/feed)	25	Gram	198	1	Salmonella spp., unspecified	1
	Meat from other animal species or not specified - fresh - Unspecified - Not Available - Not Available - Unspecified - Not applicable - Not specified	single (food/feed)	25	Gram	243	243	Salmonella Bovismorbificans	5
							Salmonella Brandenburg	3
							Salmonella Derby	8
							Salmonella Dublin	2
							Salmonella Give	10
							Salmonella Goldcoast	1
							Salmonella Infantis	2
							Salmonella Panama	4
							Salmonella Rissen	1
							Salmonella Typhimurium	207
	Meat from other poultry species - fresh - Unspecified - Not Available - Not Available - Unspecified - Not applicable - Not specified	single (food/feed)	25	Gram	4	4	Salmonella Newport	1
							Salmonella Senftenberg	3
	Meat from pig - carcase - Slaughterhouse - United Kingdom - animal sample - Monitoring - Official, based on Regulation 854/2004 - Objective sampling	slaughter animal batch	1000	Square centimetre	1935	15	Salmonella spp., unspecified	15
	Meat from pig - fresh - Unspecified - Not Available - Not Available - Unspecified - Not applicable - Not specified	single (food/feed)	25	Gram	54	54	Salmonella Give	12
							Salmonella Rissen	1
							Salmonella Typhimurium	11
							Salmonella Typhimurium, monophasic	30
	Meat from sheep - fresh - Unspecified - Not Available - Not Available - Unspecified - Not applicable - Not specified	single (food/feed)	25	Gram	1	1	Salmonella Derby	1

Table SALMONELLA in feed

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	All feedingstuffs - Unspecified - Not Available - Not Available - Unspecified - Not applicable - Not specified	single (food/feed)	25	Gram	146	146	Salmonella Brandenburg	2
							Salmonella Mbandaka	18
							Salmonella Montevideo	1
							Salmonella Nottingham	1
							Salmonella Panama	1
							Salmonella Senftenberg	59
							Salmonella spp., unspecified	57
							Salmonella Tennessee	1
							Salmonella Typhimurium	6
	Compound feedingstuffs for cattle - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	18	18	Salmonella Agona	1
							Salmonella California	1
							Salmonella enterica subsp. enterica rough	2
							Salmonella Idikan	8
							Salmonella Kedougou	1
							Salmonella Kentucky	1
							Salmonella Orion	1
							Salmonella Tennessee	3
	Compound feedingstuffs for fish - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	8	8	Salmonella Infantis	1
							Salmonella Kedougou	7
	Compound feedingstuffs for pigs - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	5	5	Salmonella 3,19:-:-	1
							Salmonella Carno	1
							Salmonella Nottingham	1
							Salmonella Orion	1
							Salmonella Tennessee	1
	Compound feedingstuffs for poultry (non specified) - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	23	23	Salmonella 13,23:i:-	1
							Salmonella 3,19:-:-	1
							Salmonella Agona	1
							Salmonella Banana	1
							Salmonella Cubana	3
							Salmonella Kedougou	3
							Salmonella Mbandaka	3
							Salmonella Nottingham	2
							Salmonella Oranienburg	1
							Salmonella Orion	2
							Salmonella Tennessee	4
							Salmonella Thompson	1
	Compound feedingstuffs, not specified - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	1	1	Salmonella Mbandaka	1
	Feed material of cereal grain origin - barley derived - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	3	3	Salmonella Anatum	3

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Feed material of cereal grain origin - other cereal grain derived - by-products of brewing and distilling - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	1	1	Salmonella Nottingham	1
	Feed material of cereal grain origin - wheat derived - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	4	4	Salmonella Agona	1
							Salmonella Enteritidis PT 8	1
							Salmonella Kedougou	1
							Salmonella Tennessee	1
	Feed material of land animal origin - blood products - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	2	2	Salmonella Derby	1
							Salmonella Senftenberg	1
	Feed material of land animal origin - greaves - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	1	1	Salmonella Senftenberg	1
	Feed material of land animal origin - meat and bone meal - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	10	10	Salmonella Ealing	2
							Salmonella Livingstone	1
							Salmonella Mbandaka	1
							Salmonella Montevideo	2
							Salmonella Nottingham	1
							Salmonella Orion	1
							Salmonella Senftenberg	1
							Salmonella Tennessee	1
	Feed material of land animal origin - meat meal - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	2	2	Salmonella Bovismorbificans	1
							Salmonella Livingstone	1
	Feed material of land animal origin - poultry offal meal - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	12	12	Salmonella 6,7:-:-	1
							Salmonella Agona	1
							Salmonella Kedougou	3
							Salmonella Mbandaka	3
							Salmonella Orion	1
							Salmonella Senftenberg	2
							Salmonella Tennessee	1
	Feed material of land animal origin - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	24	24	Salmonella 1,4,[5],12:i:- - DT 120	1
							Salmonella 1,4,[5],12:i:- - DT 193	3
							Salmonella Agona	1
							Salmonella Bovismorbificans	1
							Salmonella Butantan	1
							Salmonella Derby	1
							Salmonella Kedougou	1
							Salmonella London	4
							Salmonella Mbandaka	5
							Salmonella Montevideo	1
							Salmonella Nottingham	2
							Salmonella Senftenberg	3
	Feed material of marine animal origin - fish meal - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	3	3	Salmonella Kentucky	1
							Salmonella Senftenberg	1
							Salmonella Tennessee	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Feed material of oil seed or fruit origin - other - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	2	2	Salmonella Mbandaka	1
							Salmonella Senftenberg	1
	Feed material of oil seed or fruit origin - rape seed derived - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	27	27	Salmonella Agona	1
							Salmonella Havana	1
							Salmonella Idikan	3
							Salmonella Senftenberg	2
							Salmonella Tennessee	20
	Feed material of oil seed or fruit origin - soya (bean) derived - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	43	43	Salmonella 3,19:-:-	1
							Salmonella 6,7:z10:-	1
							Salmonella Agona	2
							Salmonella Cubana	2
							Salmonella Fresno	1
							Salmonella Havana	3
							Salmonella Infantis	2
							Salmonella Mbandaka	3
							Salmonella Minnesota	2
							Salmonella Newport	1
							Salmonella Not typeable	2
							Salmonella Oranienburg	2
							Salmonella Orion	3
							Salmonella Rissen	1
							Salmonella Senftenberg	11
							Salmonella Soerenga	2
							Salmonella Tennessee	2
							Salmonella Typhimurium DT 193	1
							Salmonella Typhimurium U 288	1
	Feed material of oil seed or fruit origin - sunflower seed derived - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	5	5	Salmonella Agona	1
							Salmonella Enteritidis PT 8	1
							Salmonella Give	1
							Salmonella Senftenberg	2
	Other feed material - legume seeds and similar products - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	1	1	Salmonella 1,4,[5],12:i:- - DT RDNC	1
	Other feed material - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	7	7	Salmonella Havana	1
							Salmonella Kedougou	1
							Salmonella Livingstone	4
							Salmonella Senftenberg	1
	Other feed material - vegetable - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	3	3	Salmonella Livingstone	1
							Salmonella Ohio	2
	Pet food - final product - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	11	11	Salmonella Give	3
							Salmonella Kottbus	3
							Salmonella Mbandaka	2
							Salmonella Orion	1
							Salmonella Tennessee	1
							Salmonella Typhimurium U 302	1

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Sample weight	Sample weight unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Pet food - Unspecified - United Kingdom - feed sample - Surveillance - Not applicable - Not specified	batch (food/feed)	25	Gram	51	51	Salmonella 1,4,[5],12:i:- - DT 193	4
							Salmonella 1,4,[5],12:i:- - DT 29	1
							Salmonella 3,10:l,v:-	1
							Salmonella 4,12:d:-	1
							Salmonella 4,5,12:b:-	1
							Salmonella Agona	2
							Salmonella Anatum	1
							Salmonella Bovismorbificans	4
							Salmonella Chennai	1
							Salmonella Derby	4
							Salmonella Enteritidis	1
							Salmonella Enteritidis PT 21	1
							Salmonella Give	2
							Salmonella Indiana	2
							Salmonella Infantis	3
							Salmonella Kedougou	2
							Salmonella Kottbus	5
							Salmonella Lexington	1
							Salmonella Mbandaka	3
							Salmonella Montevideo	1
							Salmonella Orion	5
							Salmonella Panama	1
							Salmonella Typhimurium DT 208	1
							Salmonella Typhimurium DT 41b	1
							Salmonella Typhimurium U 302	2

Table TOXOPLASMA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Alpacas - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	4	2	Toxoplasma	2
	Cattle (bovine animals) - Farm - Not Available - animal sample - blood - Surveillance - Official sampling - Suspect sampling	animal	41	31	Toxoplasma gondii	31
	Cattle (bovine animals) - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Survey - Official sampling - Objective sampling	animal	305	5	Toxoplasma gondii	5
	Goats - Farm - Not Available - animal sample - blood - Surveillance - Official sampling - Suspect sampling	animal	8	5	Toxoplasma gondii	5
	Goats - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	5	5	Toxoplasma	5
	Pigs - Farm - Not Available - animal sample - blood - Surveillance - Official sampling - Suspect sampling	animal	71	14	Toxoplasma gondii	14
	Pigs - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	102	0	Toxoplasma	0
	Pigs - fattening pigs - Slaughterhouse - United Kingdom - animal sample - blood - Survey - Official sampling - Objective sampling	animal	2071	75	Toxoplasma gondii	75
	Sheep - Farm - Not Available - animal sample - blood - Surveillance - Official sampling - Suspect sampling	animal	598	375	Toxoplasma gondii	375
	Sheep - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	1031	609	Toxoplasma	609

Table TRICHINELLA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Badgers - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - Official sampling - Convenient sampling	animal	114	0	Trichinella, unspecified sp.	0
	Corvids, unspecified - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - Official sampling - Objective sampling	animal	139	0	Trichinella, unspecified sp.	0
	Foxes - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - Official sampling - Objective sampling	animal	39	0	Trichinella, unspecified sp.	0
	Gulls - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - Official sampling - Objective sampling	animal	7	0	Trichinella, unspecified sp.	0
	Pigs - breeding animals - not raised under controlled housing conditions - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	249798	0	Trichinella, unspecified sp.	0
	Pigs - breeding animals - raised under controlled housing conditions - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	210571	0	Trichinella, unspecified sp.	0
	Pigs - fattening pigs - not raised under controlled housing conditions - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	497298	0	Trichinella, unspecified sp.	0
	Pigs - fattening pigs - raised under controlled housing conditions - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	515531	0	Trichinella, unspecified sp.	0
	Rats - wild - Natural habitat - United Kingdom - animal sample - organ/tissue - Monitoring - Official sampling - Objective sampling	animal	232	0	Trichinella, unspecified sp.	0
	Solipeds, domestic - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	3595	0	Trichinella, unspecified sp.	0
	Wild boars - farmed - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	1120	0	Trichinella, unspecified sp.	0
	Wild boars - wild - Slaughterhouse - United Kingdom - animal sample - organ/tissue - Surveillance - Official sampling - Objective sampling	slaughter animal batch	14	0	Trichinella, unspecified sp.	0

Table YERSINIA in animal

Area of Sampling	Matrix - Sampling stage - Sampling origin - Sample type - Sampling context - Sampler - Sampling strategy	Sampling unit	Total units tested	Total units positive	Zoonoses	N of units positive
Not Available	Alpacas - farmed - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	4	4	Yersinia enterocolitica	2
					Yersinia pseudotuberculosis	1
					Yersinia, unspecified sp.	1
	Antelopes - zoo animal - Zoo - Not Available - animal sample - organ/tissue - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia pseudotuberculosis	1
	Birds - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	1	1	Yersinia	1
	Capybaras - Zoo - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia, unspecified sp.	1
	Cattle (bovine animals) - Farm - Not Available - animal sample - caecum - Surveillance - Official sampling - Suspect sampling	animal	2	2	Yersinia pseudotuberculosis	2
	Cattle (bovine animals) - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	89	89	Yersinia enterocolitica	47
					Yersinia pseudotuberculosis	21
					Yersinia, unspecified sp.	21
	Cattle (bovine animals) - Farm - Not Available - animal sample - foetus/stillbirth - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia pseudotuberculosis	1
	Deer - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	2	2	Yersinia	2
	Gallus gallus (fowl) - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia, unspecified sp.	1
	Goats - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	1	1	Yersinia	1
	Sheep - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	22	22	Yersinia enterocolitica	18
					Yersinia, unspecified sp.	4
	Sheep - Farm - Not Available - animal sample - foetus/stillbirth - Surveillance - Official sampling - Suspect sampling	animal	2	2	Yersinia pseudotuberculosis	2
	Sheep - Farm - Not Available - animal sample - organ/tissue - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia pseudotuberculosis	1
	Sheep - Farm - Not Available - Not Available - Clinical investigations - Not applicable - Suspect sampling	animal	14	14	Yersinia	14
	Solipeds, domestic - horses - Farm - Not Available - animal sample - faeces - Surveillance - Official sampling - Suspect sampling	animal	1	1	Yersinia enterocolitica	1

FOODBORNE OUTBREAKS TABLES

Foodborne Outbreaks: summarized data

Causative agent	Food vehicle	Outbreak strenght: Strong N outbreaks	Strong N human cases	Strong N hospitalized	Strong N deaths	Weak N outbreaks	Weak N human cases	Weak N hospitalized	Weak N deaths
Campylobacter jejuni	Other or mixed red meat and products thereof					1	4	1	1
Campylobacter, unspecified sp.	Broiler meat (Gallus gallus) and products thereof	3	82	1	0	4	52	2	0
	Other foods	1	7	0	0				
	Mixed food	1	33	0	0				
	Unknown					1	12	0	0
Clostridium perfringens	Bovine meat and products thereof	2	15	0	0	1	65	1	0
	Sheep meat and products thereof					2	12	0	0
	Broiler meat (Gallus gallus) and products thereof					2	24	1	0
	Other, mixed or unspecified poultry meat and products thereof	1	12	0	0				
	Other foods	1	30	0	0				
	Mixed food					1	16	1	0
	Unknown					2	36	0	0
Cryptosporidium parvum	Unknown					1	16	0	0
Microorganisms	Pig meat and products thereof					1	26	0	0
	Mixed food					1	80	0	0
	Unknown					2	26	0	0
Norovirus	Pig meat and products thereof	1	73	0	0				
	Crustaceans, shellfish, molluscs and products thereof	1	17	0	0				
	Mixed food					1	120	0	0
Salmonella Bovismorbificans	Broiler meat (Gallus gallus) and products thereof					1	21	0	0
Salmonella Enteritidis PT 21	Broiler meat (Gallus gallus) and products thereof	1	23	0	0	1	6	1	0
	Unknown					1	10	0	0
Salmonella Enteritidis PT 4	Unknown					1	12	1	0
Salmonella Enteritidis PT 56	Mixed food					1	29	1	0
Salmonella Enteritidis PT 59	Eggs and egg products					2	17	5	0
Salmonella Enteritidis PT 8	Eggs and egg products					1	26	2	0
Salmonella Kedougou	Unknown					1	99	0	0
Salmonella Typhimurium	Pig meat and products thereof	1	31	0	0				
Scrombotoxin	Fish and fish products					1	2	0	0
Shigella flexneri	Unknown					1	4	0	0
Shigella spp., unspecified	Unknown					1	13	8	0
Unknown	Unknown					2	45	0	0
VTEC O157	Other or mixed red meat and products thereof					1	12	5	0
	Tap water, including well water	1	22	5	0				
	Other foods	2	17	11	0				

Causative agent	Food vehicle	Outbreak strenght	Strong				Weak			
			N outbreaks	N human cases	N hospitalized	N deaths	N outbreaks	N human cases	N hospitalized	N deaths
VTEC O157	Mixed food		1	50	0	0				
	Unknown						1	5	1	0

Strong Foodborne Outbreaks: detailed data

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Campylobacter, unspecified sp.	Cryptosporidium	OB48-2015	General	Other foods	CHICKEN STEW, BEEF MINCE - CHILLI CON CARNE	Analytical epidemiological evidence	Others	Others	Unknown	Inadequate heat treatment	ANALYTICAL: COHORT STUDY	1	7	0	0
	unknown	OB102-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN LIVER PARFAIT	Analytical epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified)	Unknown	Inadequate chilling$Inadequate heat treatment	ANALYTICAL: COHORT STUDY	1	44	0	0
		OB17-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN LIVER PATE	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified)	United Kingdom	Inadequate heat treatment	N_A	1	21	0	0
		OB37-2015	General	Mixed food	PASTA SALAD AND NOODLES SALAD	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Cross-contamination	ANALYTICAL: CASE-CONTROL STUDY	1	33	0	0
		OB87-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN LIVER PATE	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified)	Unknown	Inadequate heat treatment	ANALYTICAL: COHORT STUDY	1	17	1	0
Clostridium perfringens	unknown	OB100-2015	General	Bovine meat and products thereof	OXTAIL STEW	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Canteen or workplace catering	Unknown	Unknown	Storage time/temperature abuse	CLOSTRIDIUM PERFRINGENS ISOLATED IN BOTH FOOD AND 1 FAECAL SAMPLE BUT ALPHA AND ENTEROTOXIN GENES ISOLATED ONLY IN FOOD SAMPLE. OFFICE BUFFET WHERE VARIOUS FOOD ITEMS BROUGHT IN BY STAFF MEMBERS, SOME FROM HOME AND SOME PURCHASED.	1	4	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Clostridium perfringens	unknown	OB11-2015	General	Other foods	HOT COOKED SLICED BEEF WITH GRAVY SERVED IN SANDWICH AND HOT COOKED PORK WITH GRAVY SERVED IN SANDWICH	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Storage time/temperature abuse	CLOSTRIDIUM PERFRINGENS FAFLP CLP.88. ANALYTICAL: COHORT STUDY	1	30	0	0
		OB88-2015	General	Bovine meat and products thereof	ROAST BEEF, BEEF SIRLOIN	Descriptive epidemiological evidence$Detection of causative agent in food chain or its environment - Symptoms and onset of illness pathognomonic to causative agent	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	United Kingdom	Inadequate heat treatment	CLOSTRIDIUM PERFRINGENS TOXIN PRODUCING	1	11	0	0
		OB98-2015	General	Other, mixed or unspecified poultry meat and products thereof	3 BIRD ROAST (CHICKEN, TURKEY AND DUCK)	Analytical epidemiological evidence$Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	School or kindergarten	School or kindergarten	Unknown	Inadequate chilling$Inadequate heat treatment$Storage time/temperature abuse	CLOSTRIDIUM PERFRINGENS FAFLP CLP.105 | CULTURE, CPE GENE AND ENTEROTOXIN ALL DETECTED. ANALYTICAL:COHORT STUDY	1	12	0	0
Norovirus	Calicivirus - sapovirus (Sapporo-like virus)	OB4-2015	General	Crustaceans, shellfish, molluscs and products thereof	OYSTERS	Analytical epidemiological evidence$Descriptive epidemiological evidence	Others	Unknown	Unknown	Cross-contamination $Unprocessed contaminated ingredient	GENOTYPE 1 | 2. ANALYTICAL: COHORT STUDY. ALL OF THE CASES WERE POSITIVE FOR NOROVIRUS GENOTYPE 1 AND 2, BUT 3 CASES HAD MIXED INFECTIONS WITH SAPOVIRUS.	1	17	0	0
	unknown	OB70-2015	General	Pig meat and products thereof	HAM HOCK WITH ROOT VEGETABLES	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	United Kingdom	Cross-contamination $Infected food handler	NOROVIRUS GENOTYPE 1. ANALYTICAL: COHORT STUDY	1	73	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Salmonella Enteritidis PT 21	unknown	OB107-2015	General	Broiler meat (Gallus gallus) and products thereof	Chicken meat	Descriptive epidemiological evidence$Detection of causative agent in food chain or its environment - Detection of indistinguishable causative agent in humans	Multiple places of exposure in one country	Farm (not specified)	United Kingdom	Unknown	SALMONELLA ENTERITIDIS PT21/PT35. FOODBORNE AND OCCUPATIONAL EXPOSURE CASES	1	23	0	0
Salmonella Typhimurium	unknown	OB23-2015	General	Pig meat and products thereof	PORK HOG ROAST	Analytical epidemiological evidence$Descriptive epidemiological evidence	Camp or picnic	Unknown	Unknown	Inadequate heat treatment	SALMONELLA TYPHIMURIUM PT UNTYPABLE. ANALYTICAL: COHORT STUDY. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	31	0	0
VTEC O157	unknown	OB106-2015	General	Mixed food	GREEN MULTI-LEAF LETTUCE:BISTRO AND MIXED LEAF AND RAW MINCED LAMB	Analytical epidemiological evidence$Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Multiple places of exposure in one country	Farm (not specified)	Unknown	Unprocessed contaminated ingredient	VTEC O157 PT8, VT2A. ANALYTICAL: CASE-CONTROL STUDY. EVIDENCE OF UNTREATED RIVER AND POND WATER BEING USED TO IRRIGATE CROPS AT SOURCE FARMS - GUIDANCE FOR RTE SALAD PRODUCTION BEING WRITTEN TO ADDRESS THIS. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	50	0	0
		OB49-2015	General	Other foods	MIXED RED + POULTRY MEATS: VARIOUS MEAT PRODUCTS - MAY HAVE BEEN E. COLI O157 IN RAW MEATS AND /OR CROSS-CONTAMINATION OF RTE FOODS	Analytical epidemiological evidence$Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Multiple places of exposure in one country	Retail	Unknown	Storage time/temperature abuse	VTEC O157 PT 21 | 28. ANALYTICAL: CASE-CONTROL STUDY. MLVA and Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	15	10	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
VTEC O157	unknown	OB55 -2015	General	Other foods	CHICKEN BURGERS AND BEEF BURGERS	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Temporary mass catering (fairs or festivals)	Unknown	United Kingdom	Cross-contamination $Inadequate heat treatment	VTEC O157 PT 32. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	2	1	0
		OB65 -2015	General	Tap water, including well water	PRIVATE WATER SUPPLY - SPRING WATER	Descriptive epidemiological evidence$Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Others	Water source	United Kingdom	Water treatment failure	VTEC O157 PT 21 | 28, VT 2. MLVA and Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	22	5	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Campylobacter jejuni	unknown	OB74-2015	General	Other or mixed red meat and products thereof	OFFAL AND CALVES LIVER WITH JUS, MASHED POTATO, BATTERED ONIONS AND SPINACH	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified) $Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Inadequate heat treatment$Infected food handler	CAMPYLOBACTER JEJUNI ST 61 (1 SAMPLE). ANALYTICAL: COHORT STUDY	1	4	1	1
Campylobacter, unspecified sp.	unknown	OB16-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN DRUMSTICKS, CHICKEN GOUJONS	Analytical epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Cross-contamination$Inadequate heat treatment	ANALYTICAL: COHORT STUDY	1	12	2	0
		OB43-2015	General	Unknown	N_A	Unknown	School or kindergarten	Unknown	Unknown	Unknown	N_A	1	12	0	0
		OB45-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN LIVER PATE	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified)	Unknown	Inadequate heat treatment	N_A	1	8	0	0
		OB6-2015	General	Broiler meat (Gallus gallus) and products thereof	HOME MADE CHICKEN DISH	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	N_A	1	5	0	0
		OB69-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN LIVER PARFAIT. DESERT (ETON MESS)	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Farm (not specified) $Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Infected food handler	N_A	1	27	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Clostridium perfringens	unknown	OB101-2015	General	Sheep meat and products thereof	Lamb shanks	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	unknown	Unknown	Inadequate chilling$Inadequate heat treatment	N_A	1	5	0	0
		OB103-2015	General	Sheep meat and products thereof	Lamb joint	Descriptive epidemiological evidence	Residential institution (nursing home or prison or boarding school)	Residential institution (nursing home or prison or boarding school) (not specified)	Unknown	Inadequate chilling$Storage time/temperature abuse	CLOSTRIDIUM PERFRINGENS FAFLP CLP.107	1	7	0	0
		OB104-2015	General	Broiler meat (Gallus gallus) and products thereof	VARIETY OF CHICKEN MEALS WITH DIFFERENT SAUCES - ALL BUTTERFLIED CHICKEN BREAST CHARCOAL GRILLED	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	CLOSTRIDIUM PERFRINGENS FAFLP CLP.103 AND CLP.104	1	4	1	0
		OB18-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN A LA KING	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Cross-contamination	N_A	1	20	0	0
		OB57-2015	General	Unknown	N_A	Unknown	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	ONLY TWO FAECAL SAMPLES OBTAINED 5 DAYS AFTER THE ONSET. C.PERFRINGENS GROWN BUT NO ENTEROTOXIN DETECTED.	1	18	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Clostridium perfringens	unknown	OB71-2015	General	Bovine meat and products thereof	ROAST BEEF	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Camp or picnic	Unknown	Inadequate heat treatment	CLOSTRIDIUM PERFRINGENS CLP.97 - ENTEROTOXIGENIC C PERFRINGENS (FAFLP CLP.97) ISOLATED FROM 12 FAECAL SPECIMENS AND C PERFRINGENS ENTEROTOXIN DETECTED IN 9 OF THESE SAMPLES.	1	65	1	0
		OB9-2015	General	Mixed food	SHEEKH KEBAB, LAMB KADAHI AND PILAU RICE	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Inadequate heat treatment$Other contributory factor$Storage time/temperature abuse	N_A	1	16	1	0
		OB97-2015	General	Unknown	N_A	Unknown	Residential institution (nursing home or prison or boarding school)	Residential institution (nursing home or prison or boarding school) (not specified)	Unknown	Unknown	CLOSTRIDIUM PERFRINGENS FAFLP CLP.101	1	18	0	0
Cryptosporidium parvum	unknown	OB12-2015	General	Unknown	N_A	Unknown	Multiple places of exposure in one country	Retail	Unknown	Unknown	CRYPTOSPORIDIUM PARVUM IIAA15G2R1	1	16	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Microorganisms	unknown	OB15-2015	Household / domestic kitchen	Mixed food	LAMB DISH - KHAZA GOSHT - LAMB | GRAVY | GINGER | TOMATO AND RICE MEAL - KABBIDEH PULAO - RICE | VEGETABLE | MEATBALL AND MEAT AND VEGETABLE SOUP - LAMB | CARROT | SWEETCORN	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Household	Unknown	Unknown	Inadequate chilling$Inadequate heat treatment$Storage time/temperature abuse	E. COLI, ENTEROBACTERIACEAE	1	80	0	0
		OB2-2015	General	Unknown	N_A	Detection of causative agent in food vehicle or its component - Detection of indistinguishable causative agent in humans	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Infected food handler	ENTEROPATHAGENIC E. COLI (EPEC), ENTEROTOXIGENIC (ETEC)	1	9	0	0
		OB39-2015	General	Unknown	N_A	Unknown	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Inadequate heat treatment$Other contributory factor$Storage time/temperature abuse	CLOSTRIDIUM PERFRINGENS SUSPECTED	1	17	0	0
		OB58-2015	General	Pig meat and products thereof	HOG ROAST	Descriptive epidemiological evidence	Residential institution (nursing home or prison or boarding school)	Residential institution (nursing home or prison or boarding school) (not specified)	Unknown	Unknown	CLOSTRIDIUM PERFRINGENS SUSPECTED	1	26	0	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Norovirus	unknown	OB85-2015	General	Mixed food	CHICKEN TIKKA, RICE, MINT YOGHURT DIP, DAHL, NANN BREAD, SPRING ROLL	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Inadequate heat treatment$Other contributory factor$Storage time/temperature abuse	N_A	1	120	0	0
Salmonella Bovismorbificans	unknown	OB63-2015	General	Broiler meat (Gallus gallus) and products thereof	CHICKEN WRAPS/FAJITA	Descriptive epidemiological evidence	Multiple places of exposure in one country	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Outbreak in Scotland, England and Wales	1	21	0	0
Salmonella Enteritidis PT 21	unknown	OB15-1-01	General	Broiler meat (Gallus gallus) and products thereof	Chicken nuggets	Descriptive epidemiological evidence	Multiple places of exposure in one country	Unknown	Unknown	Unknown	N_A	1	6	1	0
		OB34-2015	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	10	0	0
Salmonella Enteritidis PT 4	unknown	OB47-2015	General	Unknown	N_A	Analytical epidemiological evidence$Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Infected food handler$Other contributory factor	ANALYTICAL: COHORT STUDY. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	12	1	0
Salmonella Enteritidis PT 56	unknown	OB77-2015	General	Mixed food	SANDWICHES*VARIOUS CHICKEN DISHES	Descriptive epidemiological evidence	Take-away or fast-food outlet	Farm (not specified)	Unknown	Inadequate chilling$Inadequate heat treatment$Storage time/temperature abuse	SALMONELLA ENTERITIDIS PT56 and PT8. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	29	1	0
Salmonella Enteritidis PT 59	unknown	OB13-2015	General	Eggs and egg products	N_A	Descriptive epidemiological evidence	Residential institution (nursing home or prison or boarding school)	Unknown	Unknown	Unknown	Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	2	1	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Salmonella Enteritidis PT 59	unknown	OB60-2015	General	Eggs and egg products	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	15	4	0
Salmonella Enteritidis PT 8	unknown	OB15-3-10	General	Eggs and egg products	N_A	Descriptive epidemiological evidence	Unknown	Unknown	Unknown	Unknown	N_A	1	26	2	0
Salmonella Kedougou	unknown	OB33-2015	General	Unknown	N_A	Descriptive epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Cross-contamination$Infected food handler	N_A	1	99	0	0
Scrombotoxin	unknown	OB1-2015	General	Fish and fish products	TUNA SANDWICH	Descriptive epidemiological evidence	Take-away or fast-food outlet	Take-away or fast-food outlet	Unknown	Unknown	N_A	1	2	0	0
Shigella flexneri	unknown	OB68-2015	General	Unknown	N_A	Unknown	Take-away or fast-food outlet	Take-away or fast-food outlet	Unknown	Infected food handler	A SMALL CLUSTER OF SHIGELLA FLEXNERI 2B HAD BEEN IDENTIFIED IN PEOPLE WHO HAD EATEN FOOD FROM A TAKEAWAY. Whole Genome Sequencing results confirmed close genetic relatedness of outbreak isolates.	1	4	0	0
Shigella spp., unspecified	unknown	OB59-2015	General	Unknown	N_A	Unknown	Hospital or medical care facility	Unknown	Unknown	Other contributory factor	SHIGELLA SPP. SEROGROUP 1C ATYPICAL	1	13	8	0

Causative agent	Other Causative Agent	FBO nat. code	Outbreak type	Food vehicle	More food vehicle info	Nature of evidence	Setting	Place of origin of problem	Origin of food vehicle	Contributory factors	Comment	N outbreaks	N human cases	N hosp.	N deaths
Unknown	unknown	OB105-2015	General	Unknown	Unknown	Analytical epidemiological evidence	Restaurant or Cafe or Pub or Bar or Hotel or Catering service	Unknown	Unknown	Unknown	ANALYTICAL: COHORT AND CASE-CONTROL STUDY	1	30	0	0
		OB29-2015	Household / domestic kitchen	Unknown	N_A	Unknown	Household	Unknown	Unknown	Unknown	N_A	1	15	0	0
VTEC O157	unknown	OB15-3-1	General	Unknown	N_A	Unknown	Unknown	Unknown	Unknown	Unknown	E.coli O157 PT 21/28	1	5	1	0
		OB15-4-4	General	Other or mixed red meat and products thereof	Venison	Descriptive epidemiological evidence	Unknown	Unknown	Unknown	Unknown	E.coli O157 PT32	1	12	5	0

ANTIMICROBIAL RESISTANCE TABLES FOR CAMPYLOBACTER

ANTIMICROBIAL RESISTANCE TABLES FOR SALMONELLA

Table Antimicrobial susceptibility testing of Salmonella Choleraesuis in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**
0.5				1											
1							1							1	
2															1
4		1													
16			1												
>64													1		
>128											1				
>1024												1			
<=0.03										1					
<=0.5					1				1						
<=1								1							
<=8						1									

Table Antimicrobial susceptibility testing of Salmonella Derby in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8			1												
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1		1						1							
<=2													1		
<=4											1				
<=8						1						1			

Table Antimicrobial susceptibility testing of Salmonella group B in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
4			1												
>64		1											1		
>1024												1			
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1								1							
<=4											1				
<=8						1									

Table Antimicrobial susceptibility testing of Salmonella Panama in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4			1												
8			2												
32												2			
64												1			
<=0.015							3								
<=0.03										3					
<=0.25				3										3	3
<=0.5					3				3						
<=1		3						3							
<=2													3		
<=4											3				
<=8						3									

Table Antimicrobial susceptibility testing of Salmonella spp., unspecified in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
MIC	**N of resistant isolates**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2		1													
4			1												
<=0.015							1								
<=0.03										1					
<=0.25				1										1	1
<=0.5					1				1						
<=1								1							
<=2													1		
<=4											1				
<=8						1						1			

Table Antimicrobial susceptibility testing of Salmonella Typhimurium in Meat from pig - carcase

Sampling Stage: Slaughterhouse | Sampling Type: food sample - carcase swabs | Sampling Context: Monitoring

Sampler: HACCP and own check | Sampling Strategy: Objective sampling | Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.5**	**2**	**16**	**0.064**	**2**	**2**	**0.125**	**16**	**256**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
MIC	**N of resistant isolates**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**1**
1									1						
4			1												
16			1						1						
>32															1
>64		2											1		
>128						1									
>1024												2			
<=0.015							2								
<=0.03										2					
<=0.25				2										2	1
<=0.5					2										
<=1								2							
<=2													1		
<=4											2				
<=8						1									

ANTIMICROBIAL RESISTANCE TABLES FOR INDICATOR ESCHERICHIA COLI

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: AMR MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.12**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**
MIC	**N of resistant isolates**	**60**	**2**	**0**	**0**	**48**	**4**	**1**	**13**	**0**	**2**	**93**	**115**	**0**	**80**
0.03							7								
0.12							1								
0.25							3								
0.5														3	17
1									24					2	2
2		48						1							
4		39	84						1				2		
8		10	54						3		3		1		
16		2	1			2			8			7			1
>16								1							
32			1			31						1	5		
>32									1						79
64						11					1		26		
>64		58	1										84		
128						4					1				
>128						2									
512												1			
>1024												92			
<=0.015							159								

MIC	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.12**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**	**170**
	N of resistant isolates	**60**	**2**	**0**	**0**	**48**	**4**	**1**	**13**	**0**	**2**	**93**	**115**	**0**	**80**
<=0.03										170					
<=0.25				170										165	71
<=0.5					170				133						
<=1		13						168							
<=2			29										52		
<=4											165				
<=8						120						69			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.12	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.12	32
	Lowest limit	0.06	0.25	0.06	0.06	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	82	82	82	82	82	82	82	82	82	82	82	82
MIC	N of resistant isolates	69	82	21	21	21	74	21	21	2	0	0	0
0.03										16			
0.06										1		1	
0.12		8		3						2			
0.25		11						7	1		29		
0.5		1		1	2		6	1			2		
1		2	4	1	3		20		1				
2		12	7		3	17	10		5				3
4		26	4		4	35	15		6				54
8		12	10	2	4	9	18		8				22
16		2	17		1	1	10		1				2
32		2	19			3	1						
>32		1											
64			17			14							
>64			4			3							
<=0.015										63			
<=0.03												81	
<=0.06		5		58									

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.12	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.12	32
	Lowest limit	0.06	0.25	0.06	0.06	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	82	82	82	82	82	82	82	82	82	82	82	82
MIC	N of resistant isolates	69	82	21	21	21	74	21	21	2	0	0	0
<=0.12								45	7		51		
<=0.25							2						
<=0.5													1

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.12	16	64	8	1	2
	Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
	Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
	N of tested isolates	82	82	82	82	82	82	82	82	82	82	82	82	82	82
MIC	N of resistant isolates	82	6	82	66	18	21	0	17	0	7	63	69	0	55
0.03							2								
0.06										1					
0.12							2								
0.25							11								
0.5							1							5	5
1				7	19				2						1
2				8	9										
4			47	1	14		1		1						
>4				66											
8			13		11		1		4		7		1		
>8					13		5								
16			1						5			8			
32			1			5			4				4		
>32									3						55
64		1	2			3							25		
>64		81	3										40		
128						3					1				
>128						7					6				
1024												1			
>1024												62			
<=0.015							59								
<=0.03										81					

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.12**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**
MIC	**N of resistant isolates**	**82**	**6**	**82**	**66**	**18**	**21**	**0**	**17**	**0**	**7**	**63**	**69**	**0**	**55**
<=0.25														77	21
<=0.5					16				63						
<=1								82							
<=2			15										12		
<=4											68				
<=8						64						11			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER ESBL MON pnl2

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid	Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.12	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.12	32
	Lowest limit	0.06	0.25	0.06	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	42	42	42	42	42	42	42	42	42	42	42
	N of resistant isolates	42	42	0	1	28	0	0	0	0	0	0
MIC												
0.03									4			
0.25		1					3			4		
0.5		1				13						
1		1	2			15						
2		22			5	4						4
4		9	1		30	3						31
8		5	4		6	4						6
16		2	17		1	2						1
32		1	12									
64			4									
>64			2									
<=0.015									38			
<=0.03											42	
<=0.06				42								
<=0.12							25	14		38		
<=0.25						1						

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Pigs - fattening pigs

Sampling Stage: Slaughterhouse

Sampling Type: animal sample - caecum

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: OTHER ESBL MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.12	16	64	8	1	2
	Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
	Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
	N of tested isolates	42	42	42	42	42	42	42	42	42	42	42	42	42	42
MIC	N of resistant isolates	42	1	42	31	10	11	0	5	0	3	38	36	0	32
0.06										1					
0.25							7								
0.5							2								2
1					15				4						1
2				1	7										
4			28	2	2				2						1
>4				39											
8			9		5		1				3				
>8					2		1								
16									1						
32						2			2				3		
>32															31
64		3				2						1	12		
>64		39	1										21		
128						3					1				
>128						3					2				
>1024												38			
<=0.015							31								
<=0.03										41					
<=0.25														42	7
<=0.5					11				33						
<=1								42							

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	**8**	**16**	**0.25**	**0.5**	**16**	**0.064**	**2**	**2**	**0.12**	**16**	**64**	**8**	**1**	**2**
	Lowest limit	**1**	**2**	**0.25**	**0.5**	**8**	**0.015**	**1**	**0.5**	**0.03**	**4**	**8**	**2**	**0.25**	**0.25**
	Highest limit	**64**	**64**	**4**	**8**	**128**	**8**	**16**	**32**	**16**	**128**	**1024**	**64**	**8**	**32**
	N of tested isolates	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**	**42**
MIC	**N of resistant isolates**	**42**	**1**	**42**	**31**	**10**	**11**	**0**	**5**	**0**	**3**	**38**	**36**	**0**	**32**
<=2			4										6		
<=4											36				
<=8						32						3			

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from bovine animals - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.12	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.12	32
	Lowest limit	0.06	0.25	0.06	0.06	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	2	2	2	2	2	2	2	2	2	2	2	2
MIC	N of resistant isolates	1	2	1	1	1	2	1	1	0	0	0	0
0.12		1											
1			1		1		1						
2							1		1				1
4		1				1							1
32			1			1							
<=0.015										2			
<=0.03												2	
<=0.06				1									
<=0.12								1			2		

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from bovine animals - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	Nalidixic acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.12	16	64	8	1	2
	Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
	Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
	N of tested isolates	2	2	2	2	2	2	2	2	2	2	2	2	2	2
MIC	N of resistant isolates	2	0	2	2	1	0	0	0	0	0	2	1	0	1
1				1	1										
2					1										
4			2												
>4				1											
>32															1
>64		2											1		
128						1									
>1024												2			
<=0.015							2								
<=0.03										2					
<=0.25														2	1
<=0.5									2						
<=1								2							
<=2													1		
<=4											2				
<=8						1									

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON pnl2

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM substance	Cefepime	Cefotaxim	Cefotaxime + Clavulanic acid		Cefoxitin	Ceftazidim	Ceftazidime + Clavulanic acid		Ertapenem	Imipenem	Meropenem	Temocillin
	Cefotaxime synergy test	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available		Not Available	Not Available	Not Available	Not Available
	Ceftazidime synergy test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Positive/Present	Negative/Absent	Not Available	Not Available	Not Available	Not Available
	ECOFF	0.12	0.25	0.25	0.25	8	0.5	0.5	0.5	0.06	0.5	0.12	32
	Lowest limit	0.06	0.25	0.06	0.06	0.5	0.25	0.12	0.12	0.015	0.12	0.03	0.5
	Highest limit	32	64	64	64	64	128	128	128	2	16	16	64
	N of tested isolates	6	6	6	6	6	6	6	6	6	6	6	6
MIC	N of resistant isolates	6	6	1	1	1	6	1	1	0	0	0	0
0.03										2			
0.12				1									
0.25								2					
0.5		1											
1							2						
2		1			1	1	1						
4		1	1			2	1		1				3
8		2	1			2	2						2
16		1	1										1
32			2			1							
64			1										
<=0.015										4			
<=0.03												6	
<=0.06				4									
<=0.12								3			6		

Table Antimicrobial susceptibility testing of Escherichia coli, non-pathogenic, unspecified in Meat from pig - fresh - chilled

Sampling Stage: Retail

Sampling Type: food sample - meat

Sampling Context: Monitoring

Sampler: Official sampling

Sampling Strategy: Objective sampling

Programme Code: ESBL MON

Analytical Method: Macromethod broth dilution and tubes incubation (Dilution - broth in tubes)

Country of Origin: United Kingdom

	AM										Nalidixic				
	substance	Ampicillin	Azithromycin	Cefotaxim	Ceftazidim	Chloramphenicol	Ciprofloxacin	Colistin	Gentamicin	Meropenem	acid	Sulfamethoxazole	Tetracycline	Tigecycline	Trimethoprim
	ECOFF	8	16	0.25	0.5	16	0.064	2	2	0.12	16	64	8	1	2
	Lowest limit	1	2	0.25	0.5	8	0.015	1	0.5	0.03	4	8	2	0.25	0.25
	Highest limit	64	64	4	8	128	8	16	32	16	128	1024	64	8	32
	N of tested isolates	6	6	6	6	6	6	6	6	6	6	6	6	6	6
MIC	N of resistant isolates	6	0	6	6	1	1	0	2	0	0	4	5	0	2
0.25							1								
0.5															1
1					2										
2					1										
4			5	1	1										
>4				5											
8			1		2				1		1				
16									1						
32						1									
>32															2
64													3		
>64		6											2		
>1024												4			
<=0.015							5								
<=0.03										6					
<=0.25														6	3
<=0.5									4						
<=1								6							
<=2													1		
<=4											5				
<=8						5						2			

OTHER ANTIMICROBIAL RESISTANCE TABLES

Specific monitoring of ESBL-/AmpC-/carbapenemase-producing bacteria and specific monitoring of carbapenemase-producing bacteria, in the absence of isolate detected

Programme Code	Matrix Detailed	Zoonotic Agent Detailed	Sampling Strategy	Sampling Stage	Sampling Details	Sampling Context	Sampler	Sample Type	Sampling Unit Type	Sample Origin	Comment	Total Units Tested	Total Units Positive
CARBAMON	Pigs - fattening pigs	Escherichia coli, non-pathogenic, unspecified	Objective sampling	Slaughterhouse	N_A	Monitoring	Official sampling	animal sample - caecum	slaughter animal batch	United Kingdom	N_A	294	0