

The report of the Chief Veterinary Officer

Animal health 2002

JANUARY 31 | FEBRUARY 28 | MARCH 31 | APRIL 30 | MAY 31 | JUNE 30 | JULY 31 | AUGUST 31 | SEPTEMBER 30 | OCTOBER 31 | NOVEMBER 30 | DECEMBER 31



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Department for Environment
Food and Rural Affairs

The report of the Chief Veterinary Officer

Animal health 2002

Department for Environment, Food and Rural Affairs
Scottish Executive Environment and Rural Affairs Department
Welsh Assembly Government
June 2003

Acknowledgement for photographic material

We express our grateful thanks to the following for their permission to use the photographs contained in this report:

- Mike Lomas, Veterinary Advisor, Page Street;
- Veterinary Laboratories Agency, Weybridge.

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Published by the Department for Environment, Food and Rural Affairs. Printed in the UK, June 2003, on recycled material containing 80% post-consumer waste and 20% totally chlorine-free virgin pulp.

Product code PB 8258

Introduction



JM Scudamore, BSc, BVSc, MRCVS
Chief Veterinary Officer and Director General
Animal Health and Welfare

Following the foot-and-mouth disease (FMD) epidemic in 2001, we returned to something approaching normality in 2002, although there were, as ever, a great many new and on-going challenges for us to face as well as work dealing with the consequences of FMD.

Early in 2002 Great Britain's status as an 'FMD-free country without vaccination' was restored by the Office International des Epizooties (OIE) and the European Union (EU). This formally marked the end of the epidemic, leaving us with the lessons to be learned for the future. The *Lessons Learned Inquiry* highlighted, amongst other things, the need for greater flexibility, for more involvement of interested parties in contingency planning, the importance of scaling up operations quickly, and better communication. The Royal Society report contained 10 key findings, and in commenting on scientific issues relating to the transmission, prevention and control of epidemic diseases in livestock gave a clear steer towards a stronger framework for

emergency preparedness. The Government accepted virtually all the recommendations made and endorsed the lessons drawn by these inquiries.

Recognising the importance of animal movement controls in a disease prevention strategy, a 20-day whole farm standstill period remained in place during 2002, pending the conclusions of a full risk assessment and cost benefit analysis due in early 2003. We also began to develop a biosecurity training module for farmers, land managers and vets, and published an advisory summary leaflet in August.

A risk assessment to consider the likelihood of FMD entering the country via illegally imported meat was undertaken to help inform future policy and targeting. Work to improve detection of illegal food imports was a priority, with a pilot scheme for the use of detector dogs being implemented at Heathrow Airport, the use of scanners at ports and additional enforcement staff at major ports and airports. This was backed up by a publicity campaign to raise awareness of the import rules and penalties for breaking them.

Following sustained pressure from the UK Government, the rules on personal imports of products of animal origin were strengthened with effect from 1 January 2003. The roles and responsibilities for control of food imports were also examined by the Cabinet Office and a transfer of anti-smuggling enforcement activity to HM Customs and Excise in 2003 was recommended alongside agreed funding to ensure progress in the coming years.

Introduction

Work in a number of areas was necessarily curtailed during FMD. Every effort was made to restart disrupted work towards the end of 2001 and at the beginning of 2002, and our tuberculosis control programme and the randomised badger culling trial have recommenced albeit with a backlog of testing to be overcome. The number of new cases of bovine spongiform encephalopathy (BSE) continued to fall rapidly during 2002, and an expanded testing programme has provided further useful information on the incidence of the disease. A number of different schemes and initiatives under the National Scrapie Plan commenced with the objective of increasing the level of resistance to transmissible spongiform encephalopathies (TSEs) in the national sheep flock. A new EU Animal By-Products Regulation was adopted in October 2002 and will apply to all member states from May 2003.

European Bat Lyssavirus (EBLV), a rabies-related virus, was discovered on two occasions last year and, in one tragic instance, resulted in the death of a bat worker in Scotland though the source of the infection remained unknown. He had not been vaccinated against rabies and the virus has crossed from bats into people on only three other occasions in the last 25 years. This is the first instance of human fatality due to EBLV in the UK. These instances do not compromise the rabies-free status of Great Britain, but in conjunction with the Department of Health (DH) and the Bat Conservation Trust we issued urgent guidance on vaccination to bat workers and a study of the incidence of EBLV in British bats is underway.

In its report of January 2002, the Policy Commission on the Future of Farming and Food recommended that the UK reviewed its national strategy for animal health and welfare, a recommendation supported by the other FMD inquiries. Work has been undertaken during 2002 to develop an Animal Health and Welfare Strategy and a consultation exercise was launched during the year with a view to publishing a 10-year strategy and delivery plan in 2003. In partnership with the Scottish Executive and the Welsh Assembly Government, this will provide an opportunity to ensure we build a shared vision with industry and commit to developing a sustainable future for animal health and welfare in Great Britain.

As part of the overall Animal Health and Welfare Strategy, a new Veterinary Surveillance Strategy for the UK was launched in 2002. Developed in partnership with the Agriculture Departments of the UK's devolved administrations, the strategy seeks to improve on existing systems for the collection and analysis of national data on endemic and exotic diseases, intoxications, infections or welfare of farmed, wild and companion animals. The strategy will be driven by a continuous surveillance of the animal population in the UK and will facilitate prompt and appropriate decisions to be made regarding the safety of food, human and animal health, animal welfare and future research requirements. The relevance and importance of the strategy in the aftermath of FMD will be apparent, and in this report a large section on disease surveillance reports on a variety of issues of which FMD is but one.

During 2002, work began on a new Animal Welfare Bill to draw together and simplify over 20 pieces of existing legislation relating to the welfare of animals kept by humans. Covering a broad spectrum of current laws and animals, and following a consultation exercise, an

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outline of the Bill was announced in October and work continues to ensure that representations made by interested parties are properly assessed.

The Pet Travel Scheme was further extended to include Bahrain, Canada and the USA. Since the introduction of the scheme in February 2000 over 81,000 cats and dogs have entered Great Britain without the requirement for rabies quarantine, nearly half of them in 2002 alone.

Finally, I would like personally to thank all my staff for the challenging work they have undertaken in the past year. They have continued to demonstrate a high level of dedication and commitment to developing and implementing national animal health and welfare policies and issues.

JM Scudamore BSc, BVSc, MRCVS

Chief Veterinary Officer and
Director General Animal Health and Welfare
Department for Environment, Food and Rural Affairs

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Section A: Protection of public health in relation to food and diseases transmissible to humans

Chapter A1: Bovine spongiform encephalopathy (BSE) and other transmissible spongiform encephalopathies (TSEs)

The number of BSE cases in Great Britain continues to fall rapidly as the proportion of the cattle breeding herd born after the introduction of extra control measures on animal feed in August 1996 increases. The Government's greatly expanded cattle testing programme is providing useful additional information on the prevalence of the disease. The results broadly support the reduction in cases shown by passive veterinary surveillance.

Scrapie is a progressive and fatal neurological disorder and is perhaps the most widely recognised spongiform encephalopathy of animals. The disease has been reported in many countries and has been recognised in British sheep flocks for over two centuries, having been first recorded in 1732. Scrapie affects sheep and goats naturally and can be transmitted experimentally to several animal species.

TSE regulations

With the discovery of more BSE cases in other parts of Europe, additional measures have been introduced across the European Community (EC) to tackle the disease and other TSEs such as scrapie in sheep. The controls draw heavily on the robust arrangements previously in place in Great Britain.

The TSE (England) Regulations 2002, implementing European Union (EU) legislation, came into force in April 2002 following a public consultation by Defra and the Food Standards Agency (FSA). These replace most of the previous national

legislation on BSE, helping to consolidate the complex body of regulations which has grown up over the last few years. Similar legislation is now in force in Scotland and Wales.

In particular, the Regulations bring together controls and procedures for:

- animals suspected of being infected with TSEs and those confirmed as being infected;
- animal feeding, which affect most farmed livestock;
- specified risk material from ruminants – this material is defined and the disposal and movement of it is subject to controls;

- compulsory monitoring and testing programmes for BSE and scrapie.

A copy of the TSE Regulations 2002 is available at: www.legislation.hmso.gov.uk

BSE

Overall, the BSE epidemic in cattle in Great Britain is continuing to decline rapidly. In 2002, the disease was confirmed in 441 animals on the basis of clinical signs (passive surveillance) and a further 569 cases were confirmed through the active surveillance programme (from 333,075 animals tested). This compares with 781 clinical cases and 318 cases confirmed through active surveillance out of 78,852 animals tested during 2001.

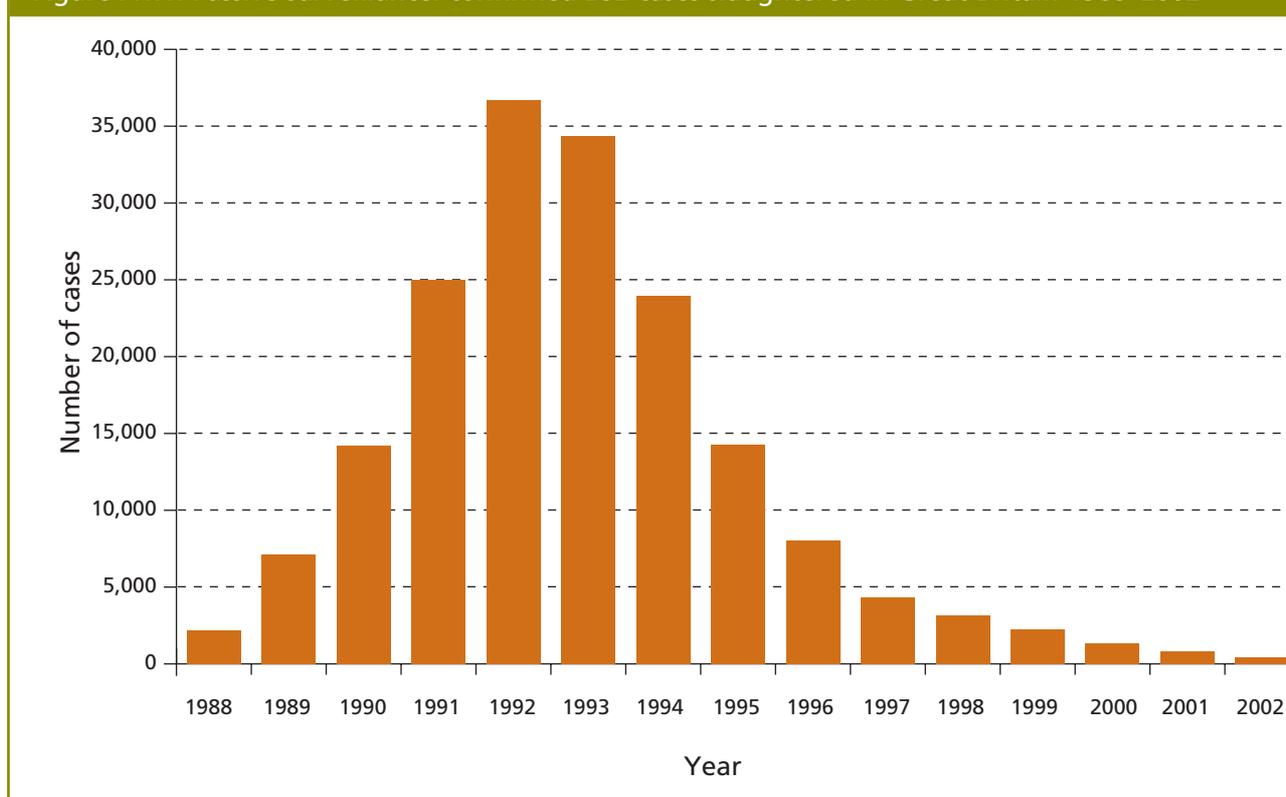
BSE cases born after the mammalian meat-and-bone meal ban

During 2002, 23 animals in Great Britain born after the ban on mammalian meat-and-bone meal in August 1996 were identified as having BSE. Of these animals, 18 tested positive under the Government's BSE testing programme; the remaining cases were detected via passive veterinary surveillance.

These cows would not have entered the human food chain because of the rule that prevents meat from animals aged over 30 months being sold for human consumption. They would also have been ineligible for the Date Based Export Scheme (DBES) because of their age. The offspring of these cases were traced, placed under restrictions and are not permitted to enter the food chain.

In accordance with standing procedures, cohort animals (animals from the same herd

Figure A1.1: Passive surveillance: confirmed BSE cases slaughtered in Great Britain 1988–2002



born 12 months either side of these animals) have been traced, placed under movement restrictions and barred from the food chain. In all these cases the cohort animals will, in any event, be excluded from the food chain because of their age.

As a result of possible maternal transmission, some infected animals were always expected to be born after August 1996, but there is no indication that this is the source of infection in any of the cases discovered during 2002. The Government has been carefully examining veterinary advice on the possible cause of these cases for evidence of control failure or new routes of transmission of the disease. It is still considered, however, that Great Britain has stringent rules in place to protect public health and to eradicate the disease, and that the cattle population born after 1 August 1996 is largely BSE-free.

BSE in sheep

There is a theoretical risk that BSE could exist in sheep because some sheep may have consumed feed infected with the BSE agent in the same way as cattle prior to July 1988 when ruminant protein was banned from ruminant feed. It has also been shown in the laboratory that sheep can be artificially infected with the disease. Additionally, scrapie has existed in sheep for many years and shares similar clinical characteristics with experimental BSE and may thus mask BSE if it is present. EU-wide controls are in place to protect the consumer against this theoretical risk.

FVO mission

The EU's Food and Veterinary Office inspected BSE controls in May 2002 and reported that BSE risks continue to be dealt with effectively. The Food and Veterinary Office noted a major achievement in the

delivery of a new BSE cattle-testing programme and agreed an amendment to the DBES to allow approved plants to handle cattle and beef not eligible for export by time separation. The progress made in addressing previous recommendations was acknowledged.

British Cattle Movement Service online

A major upgrade of the cattle tracing system computer database began in 2002. When completed, the British Cattle Movement Service will be able to improve their service to industry and government, including issuing statements to keepers of their database records.

There are now 28% of birth registrations and 41% of movement notifications being made electronically to the cattle tracing system. This is more accurate than paper-based systems, and the usage continues to increase.



Electronic birth registrations and movement notifications of cattle continues to increase.

Livestock identification

A Livestock Identification Programme was created to establish a single point for collecting livestock information from farmers,

encouraging them to use electronic means of recording and sending information to a central database. The basic livestock data is then available to internal and external users.

A successful partnership between Defra and the British Standards Institute (BSI) developed and published a publicly available specification (PAS 44:2002) for the approval of official cattle eartags. The new system replaced the field trial system with a more robust system of approval against technical specifications and supported by testing in a laboratory approved by the International Organisation for Standardisation (ISO).

A batch movements database was completed by developing the Animal Movements Licensing System to provide a central source of movement information for animal health purposes and improve enforcement in line with EU obligations.

A consultation document was published detailing proposals to improve pig identification and traceability requirements. Domestic sheep and goat identification rules were enhanced following foot-and-mouth disease (FMD), while new EC proposals issued in December 2002 for the identification and tracing of individual sheep and goats are being considered.

Scrapie

Scrapie in sheep can be found virtually worldwide but is notably absent in Australia and New Zealand. Many breeds and both sexes are affected, and the age of peak incidence is about 3.5 years. The onset of disease is insidious and frequently subtle, though usually clear enough to permit clinical diagnosis by an experienced observer.

Clinical signs

The fleece can be harsh to handle, tolerance towards exercise is reduced, the gait can become unsteady and water metabolism alters so that sheep drink small quantities more frequently. They may also discharge abnormally small quantities of urine, and rumination may be reduced. Rubbing the poll and buttocks in response to pruritus (itching) is common, but does not occur in all cases.

In the latter stages, behavioural changes show up in several ways. Animals may become more nervous or aggressive and may seek separation from the rest of the flock. Hypersensitivity to sound or movement may occur as might muscular twitches or tremors – hence the origin of the French word for scrapie, *la tremblante*. Wool loss through rubbing and nibbling are common features coupled with a general loss of condition – rubbing the back commonly stimulates a nibble reflex.

Ataxia (incoordination), especially of the hind limbs, is a major feature and can sometimes be accompanied by a tendency to move with a stilted, high stepping gait or to hop like a rabbit. A feature described in Shetland sheep was sudden death. It is not known whether these cases exhibited clinical signs of scrapie that went unobserved prior to death.

Not all sheep demonstrate the full range of clinical signs and there may be differences, subtle or otherwise, between scrapie in different breeds and countries. There could also be a change with time; for example in Iceland, scrapie now frequently presents with pruritus, whereas previously it did not do so. Comprehensive studies have not yet been undertaken on the range of clinical signs and their relation to possible variables.

Table A1.1: Summary of scrapie cases in Great Britain 1993–2002

Year	Positive	Negative	Inconclusive	Pending
1993	328	163	3	0
1994	235	90	2	0
1995	254	56	1	0
1996	460	87	3	0
1997	508	83	4	0
1998	499	99	1	0
1999	598	117	2	0
2000	568	86	0	0
2001	295	57	9	0
2002	419	104	1	17

Genetics

There is a substantial body of evidence that clarifies the role of the sheep PrP gene in conferring susceptibility or resistance to infection with clinical scrapie. Studies at the Institute of Animal Health, Edinburgh, led the way, and other groups in the UK and around the world have since provided further supportive evidence. The use of this knowledge has enabled the development of scrapie genotyping and breeding programmes for scrapie resistance. In Great Britain this has led to the development of the National Scrapie Plan (NSP).

National Scrapie Plan (NSP)

The NSP, a joint initiative of British agriculture and rural affairs departments, was officially launched in July 2001. Its principal objective is to increase the level of resistance to TSEs from the national flock; and as a consequence, remove the present theoretical risk to human health arising from the possible presence of BSE in sheep. Extensive

information on the Plan is published on the internet at:

www.defra.gov.uk/animalh/bse/bse-science/scrapie/nsp/nsp.html

Owners of eligible flocks receive, free of charge: electronic identification of sheep tested, blood sampling, scrapie genotype testing, flock results, individual animal certification (of scrapie genotype) and, if necessary, veterinary advice on selection and breeding for scrapie resistance. In return for this, they adopt a breeding strategy to increase the prevalence of resistant genotypes in their flock in line with NSP rules. There are a number of different schemes and initiatives operating as part of the Plan.

Ram Genotyping Scheme

The Plan was initially open to rams purebred flocks, registered with Breed Societies, but in January 2002 the NSP was opened up to non-registered purebred flocks. During 2002 more than 1,200 applications were received from this sector, 888 visits were carried out

and more than 31,000 animals were sampled. As many flocks in the pedigree/purebred sector tend to be small, a large number of ewes were also tested in these flocks to make the farm visits economical.

Rare Breeds Genotype Survey

A Rare Breeds Genotype Survey was carried out in 2002. Around 22,000 animals were genotyped for free in 836 flocks, whose owners were members of the Rare Breeds Survival Trust. The results are currently being analysed with the Trust in order to inform decisions on scrapie controls for these breeds.

Semen testing

An NSP semen testing service was launched in July 2002. The service provides genotyping of stored semen for use in NSP flocks, where the rams are dead or no longer available for blood sampling.

'Type 3' changes

In early November 2002, changes were introduced that enabled NSP members to trade and breed from 'type 3 genotype' rams for a further two years. These are rams that, because of their genotype, do not confer scrapie resistance to their progeny, but neither do they carry the most susceptible genes. These changes apply only to breeds that, because of their genotype distribution, faced particular difficulty in complying with the original rules. These are mainly hill breeds.

The changes should enable such breeds to increase their resistance as fast as they reasonably can, while retaining other important genetic characteristics.

Ewe Genotyping Service

At the beginning of December 2002, NSP members were invited to apply for a one-off Ewe Genotyping Service running to the end of March 2003. Industry representatives encouraged the introduction of the service, which enables individual flock owners to make more informed breeding decisions. Participants can use the information to increase the overall numbers of sheep carrying the most resistant genotypes within their flocks, while retaining key breed characteristics.

Under the Ewe Genotyping Service, the Government pays for the blood sampling kit, genotype test, associated carriage costs and the provision of a printed results summary. Farmers bear the cost of their own private vet to carry out the blood sampling.



Scrapie testing using the Prionics-check technique (a western immunoblotting system)

Field capability

Around 150 State Veterinary Service (SVS) Animal Health Officers and Veterinary Officers were trained and certified for NSP work. In addition, more than 120 local veterinary

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Table A1.2: NSP activity during 2002 (up to 6 January 2003)

	Members	Visits	Samples
Purebred registered flocks	5,002	5,680	205,939
Purebred non-registered flocks	1,031	888	31,001
Rare Breeds Survey	805	861	21,697
Ewe Genotyping Service (Dec 02–Mar 03)	–	42	2,145
NSP-tested sheep currently outside NSP flocks	–	–	30,804
Total	6,838	7,471	291,586

Table A1.3: Results by genotype groups for sheep genotyped for the Ram Genotyping Scheme

Genotype group	Proportion at end of 2002 (%)
Type 1 (most resistant)	24
Type 2 (careful selection)	39
Type 3 (no sale or use for breeding after specified dates)	29
Type 4 (susceptible – approved breeding programme possible)	4
Type 5 (highly susceptible – slaughter or castration)	4

inspectors attended NSP training sessions (more courses are planned). Following successful training and assessment, Animal Health Officers, Veterinary Officers and local veterinary inspectors are then certified to administer the NSP electronic identification device – ruminal bolus – and carry out NSP field work.

Sales and shows

There was an NSP stand at six shows between May and July 2002, and an NSP presence at 29 sales between July and October 2002. The aim was to promote an understanding of the NSP, answer questions and encourage applications. Defra also provided an on-the-spot sampling service for animals bought into NSP flocks, or NSP

animals that had lost their electronic identification device – the ruminal bolus. The 'Royal Welsh' and 'Sheep 2002' were particularly successful events for the NSP.

NSP genotyping

Scrapie-affected flocks

Departments continued to work on proposals for a voluntary NSP Scrapie Flocks Scheme. A public consultation was launched in November 2002, on a scheme which would be available for holdings that have reported scrapie in recent years. It would provide more extensive genotyping than other NSP schemes but with much tighter restrictions on the use of sheep of particular genotypes.

Key features in line with EU proposals include: whole flock genotyping, culling/destruction of the most susceptible genotypes, with compensation and assistance with the sourcing of resistant replacement stocks.

EU proposals

The EU Standing Committee on the Food Chain and Animal Health adopted two EU proposals in December 2002. The first sets minimum requirements for genotype-based breeding programmes, including the slaughter or castration of rams with the most susceptible VRQ-carrying genotypes and restriction on ewes of known VRQ genotypes going for breeding (VRQ stands for the amino acids valine, arginine and glutamic acid which are scrapie-related alleles). Derogations at Member States' discretion are provided for rare breeds and breeds with low levels of resistance. These requirements apply on a voluntary basis from January 2004 but will become compulsory from April 2005. Member States will also be required to set out a framework for recognising the TSE-resistant status (flock certification) of individual flocks.

The second proposal (Regulation (EC) No. 260/2003) provides for extensive genotyping-based action on holdings that have a confirmed case of scrapie from October 2003. It will have many features in common with the above-mentioned voluntary NSP Scrapie Flocks Scheme, but it will not be retrospective.

New Animal By-Products Regulation

The new EU Animal By-Products Regulation was adopted in October 2002 and will apply in Member States from 1 May 2003.

The Regulation permits the use of composting and biogas treatments for catering waste and low-risk animal by-products. Animal by-products must be treated to at least the EU standard of 70(C for 1 hour. However, for plants which process only catering waste (not animal by-products), the Regulation allows Member States to specify national standards.

Defra commissioned a risk assessment examining the risks to public and animal health from the use of catering waste in composting and biogas treatment processes. The risk assessment makes recommendations on the minimum treatment and hygiene standards necessary to ensure that composting of catering waste can be done safely.

A consultation exercise was completed on a proposed amendment to the Animal By-Products Order 1999 which would introduce national standards for composting and biogas processing, based on the recommendations made in the risk assessment.

Active surveillance for TSEs

Since mid-2001, EU Member States have been required to undertake surveillance for TSEs among specific populations of cattle, sheep and goats. This requirement is laid down in the EU TSE Regulation 999/2001 (as amended).

Veterinary Laboratories Agency (VLA) surveillance: BSE

The cattle surveillance programme was expanded during 2002 in accordance with EU legislative requirements. In January 2002, the over-30-month fallen cattle survey was

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Table A1.4: Results from active surveillance for BSE in cattle in Great Britain during 2002

	No. tested	No. positive	No. negative
Beef Assurance Scheme cattle	238	238	0
Fallen cattle	73,837	73,701	136
Casualty cattle aged over 24 months	115,319	114,876	443
Cattle born after 31 July 1996 and aged over 42 months (excluding fallen stock and casualties)	132,859	132,853	6
Cattle born after 31 July 1996 and aged over 42 months (including fallen stock and casualties)	153,662	153,648	14
Random sample of cattle born before August 1996	10,080	10,071	9
BSE offspring	742	742	0
Birth cohorts of BSE cases	8	8	0

extended to include fallen stock aged over 24 months. This was followed by the expansion in August 2002 of the 1996/97 cohort survey of cattle born between August 1996 and 1997 (the year following the imposition of the effective feed ban) to cover all cattle born after July 1996 and aged over 42 months.

The following categories of cattle were tested for BSE in 2002:

- all human consumption cattle aged over 30 months (this is a small number of Beef Assurance Scheme cattle slaughtered between 30 and 42 months);
- all fallen stock aged over 24 months;
- all casualty animals aged over 24 months;
- all cattle born after 31 July 1996 and aged over 42 months;
- a random sample of 10,000 Over Thirty Month Scheme animals born before August 1996.

Brain samples were taken from all animals and tested using EU-approved rapid-testing procedures. In addition to the above groups, all offspring of BSE cases are tested if aged over 30 months.

VLA research: BSE

A Western Blot procedure on sheep brain tissue has been developed which appears to differentiate BSE from scrapie. A monoclonal antibody raised against PrP-scrapie does not stain PrP from the brains of sheep experimentally infected with BSE. Studies using a panel of monoclonal antibodies to different PrP epitopes have shown differential immunocytochemical staining of tissues from sheep experimentally infected with BSE or scrapie.

Section A – Chapter A1

VLA surveillance: scrapie

The UK's sheep and goat testing programme began in January 2002. This requires annual testing for scrapie on 6,000 fallen stock and 60,000 sheep and goats aged over 18 months destined for human consumption.

Testing 20,000 animals for human consumption was combined with an abattoir survey recommended by the Spongiform Encephalopathy Advisory Committee. Under this survey other tissues, as well as brain stem material, are also taken and tested using EU-approved methods.

Table A1.5: Results of active surveillance for scrapie in sheep and goats in Great Britain during 2002

	No. tested	No. positive	No. negative
Sheep and goat abattoir survey	29,722	29,674	31
Fallen stock (sheep and goats)	856	849	7

Chapter A2 Tuberculosis (TB) in cattle

Tuberculosis is an infectious and contagious disease of humans and animals caused by several species of a family of bacteria called Mycobacteriaceae. Mycobacterium bovis (M. bovis) is the bacterium that causes TB in cattle (also known as bovine TB). Although cattle are the main reservoir and natural host of M. bovis, humans and a wide range of mammals are also susceptible to this bacterium. In addition to cattle, a number of wild animals can act as reservoirs of M. bovis in different regions of the world, posing major impediments to eradicating the disease in cattle. About 1% of bacteriologically confirmed cases of TB in humans can be attributed to M. bovis.

Historical overview of TB

Up to the 1930s, a large proportion of dairy cows was infected with *M. bovis*. Many were kept near large cities to provide urban dwellers with fresh milk and most were kept closely confined in poorly ventilated cowsheds, which are ideal conditions for the disease to spread. Many cows developed infection in the udders and, because most milk was drunk raw (untreated), *M. bovis* spread easily and was the major source of TB in humans. In 1934, a government-appointed committee concluded that at least 40% of cows in dairy herds were infected with TB to some extent and that, on the evidence available, at least 0.5% of cows yielded tuberculous milk. It was also stated that bovine TB was responsible for over 2,500 deaths and for a still larger amount of illness annually among the human population (over 50,000 new human cases each year).

To try to control the problem, in 1947 the government began a programme of comparative intradermal testing of cattle for TB and slaughtering of reactors. To prevent TB spreading to other herds, cattle were not

allowed to be moved from farms that had a case of TB. This test and slaughter programme became compulsory in 1950, and by 1960 it had reduced the number of cases of TB in cattle to a very low level. By the mid-1960s, cases of TB in cattle were confined to a few pockets of infection in southwest England.

Although cases of TB in cattle have increased steadily over the last 15 years, the test and slaughter scheme remains central to our strategy to stop the spread of cattle TB. The details of the current testing programme are determined by Council Directive 64/432/EEC, which was last amended by Community Regulation (EC) No. 1226/2002 of 8 July 2002 to cater for the use of blood-based diagnostic tests.

Regular TB testing of cattle is intended to curb cattle-to-cattle transmission of *M. bovis*. This measure also ensures the early removal of infected cattle before they have developed clinical signs of disease or, in the case of dairy cows, started to shed *M. bovis* in the milk. In addition to this, routine pasteurisation (heat treatment) of cows' milk and inspection

of cattle carcasses at slaughterhouses were put in place to further protect public health. Currently, despite the increasing incidence of TB in cattle, around 45 people are diagnosed with bovine TB every year in the UK. The vast majority of these cases were contracted abroad or before the introduction of milk pasteurisation in the 1950s and their geographical distribution does not seem to mirror the spread of bovine TB in the cattle population. The threat to public health is considered to be low and *M. bovis* TB in humans is treatable.

Five-point strategy to control the spread of TB

The Government's current TB strategy revolves around a five-point plan announced in August 1998, following the publication of the Krebs Review into bovine TB in cattle and badgers. Regular TB testing of cattle, slaughter of test reactors and restrictions on the movement of cattle off affected herds remain at the core of this strategy, but these are not the only elements in it. The five points are set out below.

- 1 **Protect public health** – new arrangements with DH to investigate potential links with human health and monitor human cases of *M. bovis*.
- 2 **Develop a vaccine** – a 10–15-year research programme to develop a TB vaccine.
- 3 **Research into transmission** – further research to increase understanding of how infection is transmitted.
- 4 **Detect and prevent cattle-to-cattle spread** – continue with, and where possible strengthen, routine testing, slaughter and movement restrictions.

- 5 **Badger-culling trial** – carry out a field trial to find out whether culling badgers helps to reduce TB in cattle.

TB control programme

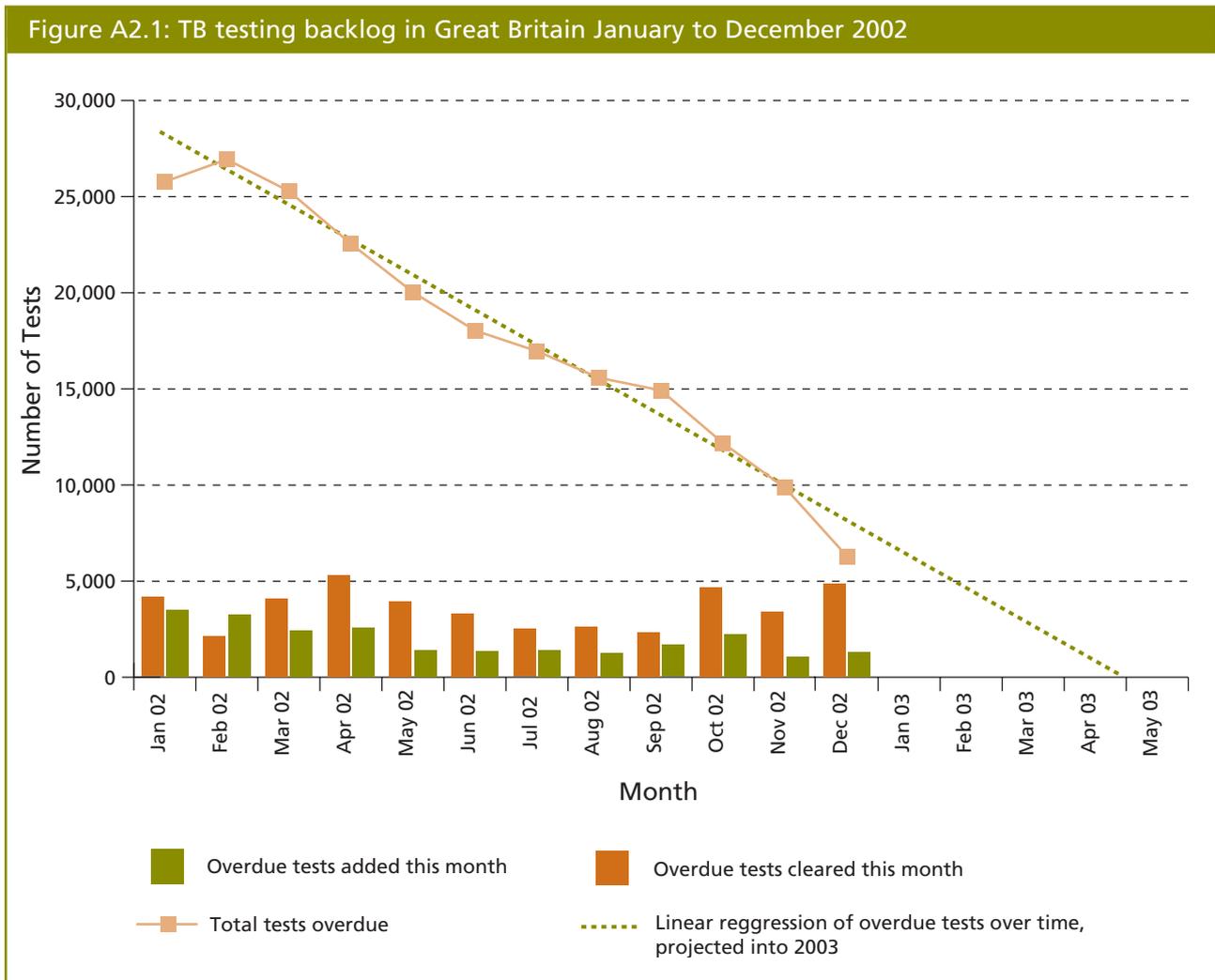
In 2002 Defra introduced a raft of new TB control measures in the wake of the FMD outbreak, namely:

- elimination of the TB testing backlog;
- more frequent TB testing of restocked cattle herds;
- promotion of private TB testing;
- limiting the movements of cattle from herds with overdue TB tests intended to monitor herds following a TB breakdown;
- a phased introduction of movement restrictions on herds with routine surveillance tests overdue by more than 6 months.

These initiatives are discussed below in more detail.

Impact of the FMD outbreak on routine TB testing

Field operations associated with the TB control programme were suspended in late February 2001 for the duration of the FMD outbreak. This was in part because visits to livestock premises presented a risk of transmission of FMD virus from farm to farm and in part to allow resources to be diverted to combating FMD. Routine TB testing did not fully resume until January 2002 and, as a result, a backlog of some 27,000 overdue herd tests had built up by February 2002. The clearance of this rolling backlog of tests made heavy demands on the SVS and the private veterinary practitioners, who as local



veterinary inspectors carried out most of the routine tests in 2002. Nevertheless, at the end of December 2002 the backlog had reduced to approximately 6,300 overdue TB herd tests, as shown in Figure A2.1. If this trend continues the backlog could be cleared by summer 2003.

As a result of the FMD outbreak in 2001, many herds in Great Britain became overdue for their TB test, particularly in areas where, because of a high incidence of TB, routine testing is done on an annual or biennial basis.

Newly formed cattle herds and premises restocked with cattle after a herd slaughter require, as a rule, one whole-herd TB test three to six months after restocking. To manage the increased risk of introducing TB through movements of infected cattle into re-formed herds, Defra instigated a programme of more frequent testing of premises restocked after FMD. In addition to the usual check test carried out three to six months post-restocking, those premises now require two further check tests at 12-month intervals before reverting to the normal testing interval for their parish.

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According to Defra's DCS database, 5,367 livestock holdings were depopulated in the FMD epidemic of 2001. Provisional figures suggest that between 1 November 2001 and 31 December 2002 2,540 re-formed herds of cattle had been tested for TB at least once, of which 159 had sustained a TB incident (breakdown). One of these holdings had TB incidents in two of its herds. Table A2.1 below shows the monthly distribution of these post-restocking TB tests and the resulting TB incidents.

Of these 159 TB incidents on re-formed cattle herds, 72 (45%) have been confirmed by post-mortem examination or

bacteriological culture, 81 are unconfirmed and six remain unclassified.

The county distribution of these TB incidents on restocked premises appears in Table A2.2. In addition, Table A2.2 shows the point location of all premises restocked with cattle and highlights those that sustained a TB incident after restocking.

Private TB testing

Private TB tests are carried out by local veterinary inspectors outside the routine testing programme for a herd, usually on individual animals or specific groups of cattle

Table A2.1: Cattle herds restocked after FMD and TB tested in Great Britain between November 2001 and December 2002

Month	Number of herds tested at least once (month of first test)	Total number of TB incidents recorded (confirmed and unconfirmed)
Nov 01	11	3
Dec 01	108	3
Jan 02	170	3
Feb 02	342	14
Mar 02	371	14
Apr 02	355	26
May 02	266	15
Jun 02	128	13
Jul 02	103	14
Aug 02	107	9
Sep 02	77	11
Oct 02	134	9
Nov 02	213	17
Dec 02	155	8
All	2,540	159

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Table A2.2: TB incidents in cattle herds restocked in Great Britain after FMD November 2001 to December 2002

County (only those with TB incidents on restocked premises)	Total number of TB incidents recorded (confirmed and unconfirmed)
England	
Cornwall	1
Cumbria	20
Devon	53
Durham	1
Gloucestershire	12
Hereford & Worcester	22
Lancashire	1
Northumberland	5
Shropshire	1
Somerset	4
Staffordshire	2
Wiltshire	1
North Yorkshire	1
Wales	
Powys	7
Gwent	3
Scotland	
Dumfriesshire	7
Kirkudbright	14
Wigtown	4
Great Britain	159

and at the owner's expense. Those tests have to be authorised by, and the results must be notified to, the Divisional Veterinary Manager.

Despite encouragement from Defra, the uptake of private testing by herd owners has been disappointing. Table A2.3 overleaf

shows the distribution of private TB tests carried out since 1 November 2001, by region. A total of 1,026 private tests involving 2,961 cattle were completed, of which 515 were carried out in restocked cattle herds.

Table A2.3: Number of private TB tests conducted in Great Britain since 1 November 2001

Country	SVS region	Number of tests
England	West	104
	East	26
	North	787
Scotland	–	74
Wales	–	35
Total in Great Britain	–	1,026

Movement restrictions on cattle herds with overdue TB tests

As mentioned before, a backlog of some 27,000 overdue tuberculin herd tests had built up during the FMD epidemic. These herds, of unknown TB status, posed a disease risk to other cattle herds. From a logistical and legal point of view it would have been almost impossible to place all those herds under restrictions pending the completion of their tests. Therefore, in 2002 Defra introduced four risk-based measures to minimise the spread of TB through movements of *M. bovis*-infected cattle. The measures were targeted at those herds with overdue TB tests that were perceived to pose the highest threat to naive herds. These measures included:

- immediate movement restrictions on annually tested herds that had missed a 6- or 12-month check test, pending a satisfactory test (with effect from 31 January 2002);
- provision of guidance to Divisional Veterinary Managers and local veterinary inspectors on the prioritisation of overdue TB tests, based on the likelihood of finding reactors in each type of TB test;
- movement restrictions in herds overdue a TB test by more than 12 months (with effect from 1 February 2003);

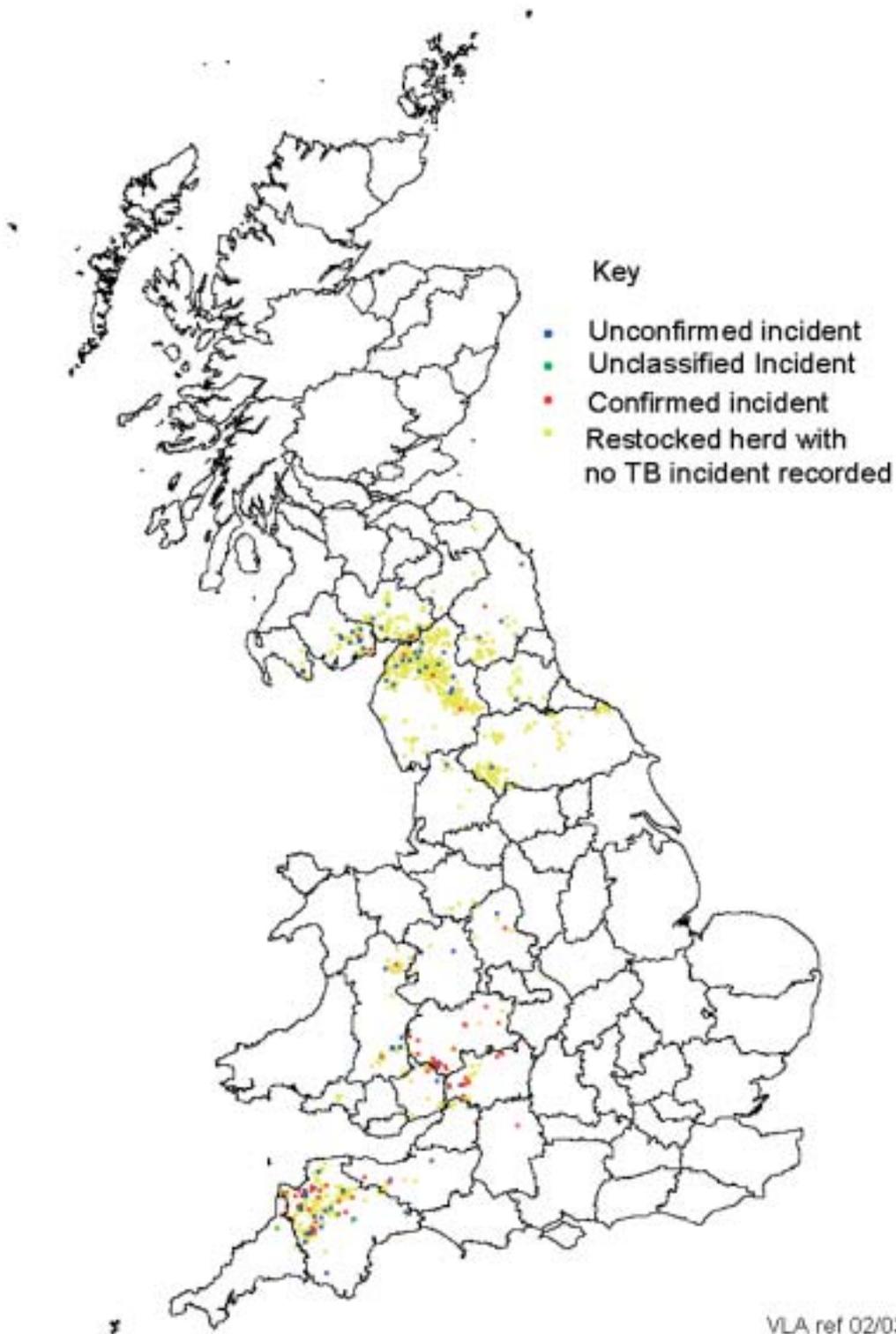
- movement restrictions in herds overdue a TB test by more than 6 months (with effect from 1 April 2003).

Limiting the movements of cattle from herds with overdue 6- or 12-month check tests

Initially Defra decided to place movement restrictions only on the group of herds with overdue tests that were more likely to be infected. A veterinary risk assessment showed that 6- and 12-month check tests historically have one of the greatest probabilities of disclosing reactors, particularly in annual testing parishes. These two types of tests are routinely carried out after the conclusion of a TB incident, in order to check for recurrent infection (recrudescence) before the herds in question revert to their normal testing regime.

From 31 January 2002, TB movement restrictions automatically come into force on every cattle herd missing a 6- or 12-month check test and located in an annual testing parish. Divisional Veterinary Managers are instructed to prioritise these types of overdue tests over the majority of other test types. Herd owners affected by these restrictions are still able to move calves under six weeks old off their holdings without a test. They

Figure A2.2: Distribution of TB incidents in restocked herds



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can also move animals that have been individually TB tested with a negative result in the 10 days preceding the date of the proposed movement. There are no annual testing parishes in Scotland, so no Scottish herds were affected by these new movement restrictions.

A total of 1,021 cattle herds in annual parishes were placed under this type of TB restriction at some stage between 31 January and 31 December 2002. Of the herds affected, 229 were still restricted at

the end of December 2002, pending completion of their overdue tests.

The overdue 6- and 12-month check tests completed between 31 January and 31 December 2002 resulted in 213 new TB incidents. This meant that almost 21% of all the herds affected by these restrictions (or 27% of those tested) proved to have tuberculin test reactors. Table A2.4 gives a breakdown of these statistics by county. Only those counties with annual testing parishes are listed.

Table A2.4: Number of herds restricted in Great Britain between 31 January and 31 December 2002 due to an overdue 6- or 12-month check test

County	Herds restricted since 31 January 2002	Restrictions still in place as at 31 January 2002	Restricted herds in which TB reactors were found
Cornwall	270	34	59
Devon	82	51	10
Somerset	59	12	14
Dorset	14	2	2
Gloucester	163	36	37
Avon	34	7	5
Wiltshire	58	15	3
Hereford & Worcestershire	73	8	20
Shropshire	3	2	0
Staffordshire	65	10	9
Derbyshire	28	6	3
East Sussex	2	1	1
Total in England	851	184	173
Dyfed	55	8	15
Powys (Radnor & Brecknockshire)	23	7	7
West Glamorgan	19	9	0
Gwent	73	21	18
Total in Wales	170	45	40
Total in Great Britain	1,021	229	213

Restrictions on herds with overdue 6- and 12-month tests were initially intended to apply until 24 January 2003. However, because of the high proportion of reactor herds disclosed so far in this group of overdue tests, these movement restrictions are likely to continue in the foreseeable future.

Herds restricted because of a long-overdue TB test

At the end of August 2002, some 4,600 of the 15,700 overdue tests (30%) had been so for at least 12 months. After consultation with officials and representatives of the farming and veterinary organisations, Ministers agreed to introduce, from 1 February 2003, movement restrictions on any cattle herds with TB tests overdue by more than 12 months. Additionally, tests more than six months overdue would trigger movement restrictions with effect from 1 April 2003. This measure was announced on 9 October 2002 as part of the so-called 'Autumn Package of TB Control Measures' (see below).

Animal Health Divisional Offices issued warning letters in the first week of November 2002 to owners of herds with tests overdue by at least 9 and 3 months, respectively.

At the end of 2002, the situation had improved and, of the approximately 6,300 tests overdue, some 1,000 (16% of the total) were overdue by at least 12 months and 1,300 (21% of the total) were overdue by 6 to 12 months. It is expected that the number of restriction notices issued in February and April 2003 will lie well below these figures.

The 'Autumn Package' of measures for the control of bovine TB

The diversion of staff to duties related to the FMD epidemic during 2001 made it difficult to introduce new control measures once the FMD epidemic had begun. A limited package of measures designed to accelerate the clearance of the backlog of TB tests, to ameliorate the economic effects of movement restrictions and to pilot possible alternative controls which might accelerate the clearance of TB from infected herds was announced on 9 October 2002.

The measures intended to accelerate the clearance of the testing backlog are discussed above. This section is concerned with the other two measures in the Autumn Package.

Field trial of gamma interferon (IFN- γ) blood test

Improved diagnosis of bovine TB is a major objective of Defra's research programme and the potential use of the gamma interferon assay is being fully explored. In July 2002, the EU officially recognised the (IFN- γ) blood test for diagnosing bovine TB in cattle, but only for use as a supplement to the conventional TB skin test.

On 28 October 2002, Defra launched a field trial to determine whether the IFN- γ test, used in tandem with the skin test, might improve the detection rate of infected cattle and thus shorten the duration of confirmed TB incidents. The trial will also assess whether the use of a more severe interpretation of the skin test at the first short-interval test could have an effect comparable to that of IFN- γ in shortening the duration of incidents.

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Defra is aiming to recruit to this trial approximately 660 herds with newly confirmed TB incidents in Wales and six English counties (Cheshire, Staffordshire, Derbyshire, Shropshire, Herefordshire and Worcestershire) over a three-year period. Herd owners' participation is voluntary and by informed written consent. Once signed up for the trial, each reactor herd is randomly allocated one of three possible 'treatments':

1 IFN group – in which the IFN- γ blood test is applied 10–28 days after the disclosing skin test and before the first short-interval test;

2 XS group – or extra-severe interpretation of the first short-interval test, whereby all standard inconclusive reactors are removed;

3 SQ group – control group, where the normal testing protocol (i.e. the status quo) applies.

As shown in Table A2.5, up to 2 March 2003 (4 months since commencement of the trial) 32 herds had been recruited into the field trial of IFN- γ .

Table A2.5: Gamma interferon pilot trial: distribution of the 32 herds recruited up until March 2003 and allocated treatment

SVS Division	Counties	Treatment	Number of herds registered for the trial
Stafford	Cheshire, Derbyshire and Staffordshire	IFN	1
		XS	–
		SQ	3
Worcester	Shropshire, Hereford and Worcestershire	IFN	1
		XS	2
		SQ	1
Caernarfon	Powys (Montgomeryshire), Clwyd and Gwynedd	IFN	1
		XS	–
		SQ	–
Cardiff	West, Mid and South Glamorgan, Gwent and Powys (Radnor and Brecknockshire)	IFN	3
		XS	5
		SQ	2
Carmarthen	Old county of Dyfed	IFN	4
		XS	4
		SQ	5
Total	–	IFN	10
		XS	11
		SQ	11

New rules for licensing movements of clear-testing cattle onto and off premises under TB restrictions

From October 2002, three types of movements off restricted premises are allowed in England and Wales:

- 1 to slaughter via an approved collection centre;
- 2 to slaughter via an approved dedicated slaughter market;
- 3 to slaughter via an approved finishing unit.

On 21 November 2002, Defra and the National Assembly for Wales Agriculture Department (NAWAD) announced a new policy governing the movements of cattle onto herds under bovine TB restrictions in England and Wales. The policy is based on veterinary risk assessment and considers the risk of bovine TB transmission for both the imported cattle and cattle in the receiving herd. Licensed movements will be subject to conditions commensurate to the associated disease risk. Movements will only be permitted from herds with known disease status and up-to-date tests.

Summary of bovine TB statistics for 2002

Before the FMD epidemic, statistics on TB were published monthly on the Defra website. The monthly statistics on herds and animals tested met the quality criteria for 'national statistics' status. However, the atypical testing patterns seen between February and December 2001 and the subsequent biases introduced by the targeting of testing to high-risk herds in the drive to reduce the backlog has meant that TB statistics in 2002 cannot meet all the criteria to regain that status.

The 2002 TB statistics presented in this report are provisional and subject to revision by Defra. Revisions are necessary, among other things, to account for delays in data entry and culture results that were outstanding when the data were extracted from Vetnet (Defra's animal health database) on 3 March 2003.

Table A2.6 gives comparative TB surveillance statistics for Great Britain from 1 January to 31 December 2002 and the corresponding period of 2000. Provisional statistics for 2002 are broken down by country (England, Wales and Scotland) and, for England, by SVS region. County statistics are shown for the West Region. As a consequence of the FMD epidemic, data for 2001 were highly skewed by the reduced levels of TB testing and are not shown in this table.

The TB testing effort in 2002 was greatly increased in relation to 2000: over four million animal TB tests and almost 44,000 herd tests were carried out in 2002, compared with three million animal tests and 35,600 herd tests in 2000. Effectively, 2002 saw a normal year and a half of testing compressed into a single year. Cattle herd numbers continued to decrease across Great Britain in relation to previous years.

Just over 4,100 cattle premises were placed under TB restrictions during 2002, compared with 2,500 in 2000. As at 31 December 2002, the number of TB restricted premises stood at 2,483.

The absolute numbers of new TB incidents (breakdowns) in 2002 almost doubled in relation to 2000 (3,281 against 1,734). At 54% (1,782 out of 3,281), the percentage of new TB incidents confirmed by visible lesions or culture was slightly below that of 2000 (59%).

Table A2.6: Comparative TB surveillance statistics for Great Britain from 1 January to 31 December 2002

County/SVS region/country	Cornwall	Devon	Somerset	Dorset	Gloucestershire	Avon	Wiltshire	Hereford & Worcestershire	Shropshire	West Region	North Region	East Region	Total England	Total Wales	Total Scotland	Total Great Britain (2002)	Total Great Britain (2000)
1. Total number cattle herds registered on Vetnet	3,780	6,087	3,492	1,837	1,546	1,084	1,569	3,075	2,968	25,438	27,224	13,875	66,537	17,510	15,537	99,584	105,714
2. Number of which were under TB2 restrictions due to a TB incident during 2002	561	645	215	106	395	137	189	454	80	2,782	396	86	3,264	802	108	4,174	2,511
TB tests carried out																	
3. Total number of herd tests	3,545	4,788	1,650	809	1,930	969	1,231	2,281	1,228	18,431	9,143	3,122	30,696	8,451	4,827	43,974	35,610
4. Total number of cattle tested	432,743	550,802	168,063	95,517	235,342	113,075	167,886	234,464	127,923	2,125,815	753,757	170,588	3,050,160	666,043	368,631	4,084,834	3,001,927
TB incidents (started in 2002)																	
5. Total new herd TB incidents	451	524	165	91	285	98	147	328	67	2,156	355	71	2,582	605	94	3,281	1,734
6. Number of which are considered confirmed new TB incidents	254	262	78	35	206	55	91	218	41	1,240	190	17	1,447	315	20	1,782	1,044
7. Number of which are considered unconfirmed TB incidents	157	232	75	45	66	40	46	84	20	765	139	49	953	239	67	1,259	683
8. Number of which are still unclassified TB incidents (pending culture results)	40	30	12	11	13	3	10	26	6	151	26	5	182	51	7	240	7

Table A2.6: Comparative TB surveillance statistics for Great Britain from 1 January to 31 December 2002 (continued)

County/SVS region/country	Cornwall	Devon	Somerset	Dorset	Gloucestershire	Avon	Wiltshire	Hereford & Worcestershire	Shropshire	West Region	North Region	East Region	Total England	Total Wales	Total Scotland	Total Great Britain (2002)	Total Great Britain (2000)
9. Total number of confirmed new incidents in 2001	65	75	15	9	45	15	24	66	11	325	46	4	375	128	1	504	504
Animals slaughtered under the TB orders																	
10. As reactors (including unresolved inconclusive reactors)	2,593	2,715	843	375	2,301	701	980	2,294	415	13,217	1,938	214	15,369	4,246	177	19,792	7,032
11. As inconclusive reactors	54	103	11	15	62	19	51	48	8	371	123	86	580	86	33	699	284
12. As direct contacts	304	294	38	0	388	68	93	435	68	1,688	652	65	2,405	662	27	3,094	1,321
OTHER ANIMALS																	
13. Slaughterhouse cases reported to the SVS (number of which confirmed)	62 (43)	10 (4)	68 (36)	3 (1)	19 (9)	43 (17)	2 (0)	9 (0)	61 (1)	277 (111)	5 (2)	37 (11)	319 (123)	40 (3)	24 (6)	383 (132)	239 (115)

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The number of tuberculin test reactors slaughtered in 2002 was 2.8 times greater than the number slaughtered in 2000 (19,792 against 7,032). As a result, the average total number of reactors per TB incident also went up (6.0 reactors per incident in 2002 against 4.1 in 2000). Similarly, 2002 also saw substantial increases in the number of inconclusive reactors and direct contacts slaughtered.

The number of slaughterhouse case reports increased from 239 in 2000 to 383 in 2002 (a 58% relative increase) although only one-third of those were confirmed by isolation of *M. bovis* from the suspect lesions.

Figure A2.3 shows the monthly percentage of tests on unrestricted herds that have resulted in confirmed TB incidents (breakdowns) between 1996 and 2002. In this chart, the number of TB incidents is adjusted by the number of TB tests actually carried out each month in order to control for seasonal effects. The chart suggests that the reduced levels of testing in 2001 have not substantially altered the underlying historical trend of confirmed TB incidents, which continues to rise at a yearly average rate of about 20%. Data for the period February–December 2001 are not comparable with previous periods because of the significant reduction in the TB testing programme and the targeting of testing to areas of higher risk.

Figure A2.3: Confirmed new incidents of bovine TB in Great Britain expressed as a percentage of unrestricted cattle herds tested during 1996–2002

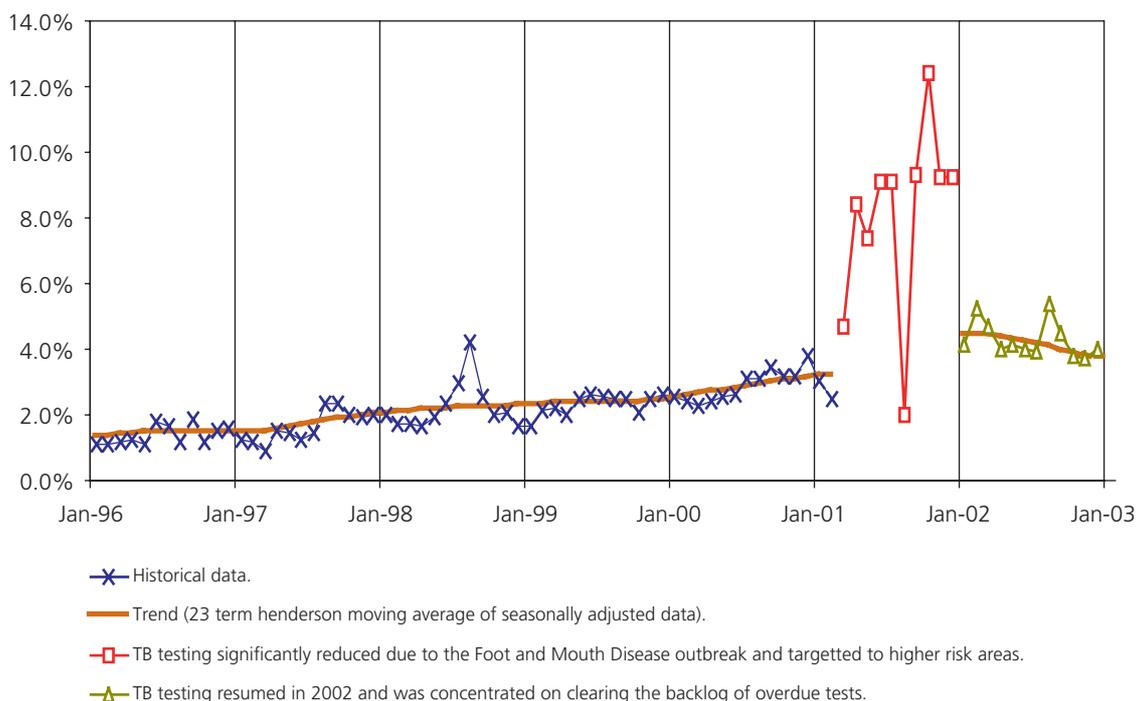
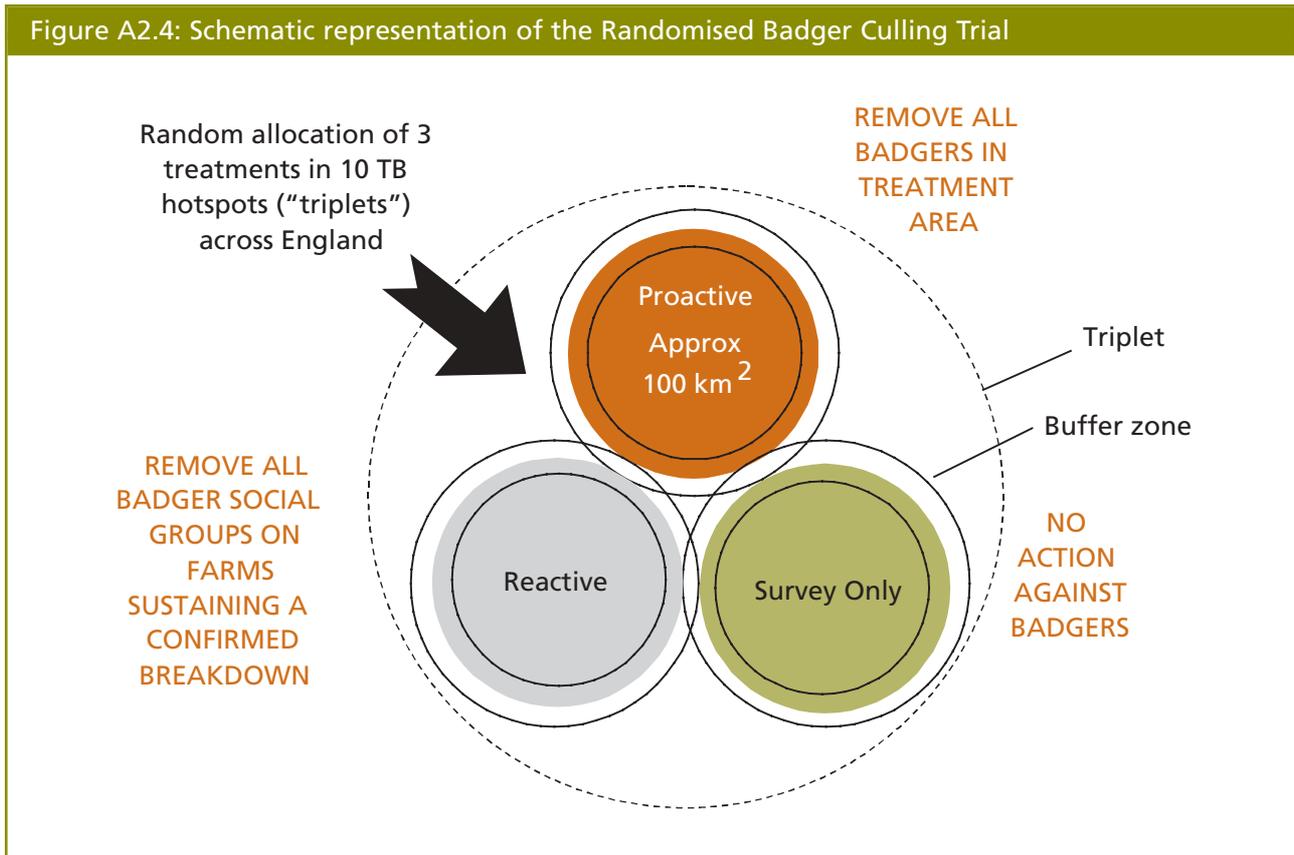


Figure A2.4: Schematic representation of the Randomised Badger Culling Trial



Randomised Badger Culling Trial

The Randomised Badger Culling Trial (RBCT) is being carried out to assess scientifically what contribution badgers make to cattle TB and whether badger culling is effective in controlling TB in cattle. Three different control methods are compared in 30 areas of around 100 km² grouped into 10 'triplets', where the incidence of TB in cattle has been relatively high (see Figure A2.4).

The Independent Scientific Group (ISG) continued to oversee the RBCT and advised Defra on operational matters.

Fieldwork recommenced at the beginning of 2002, following the loss of a complete culling year (May–January inclusive) due to the outbreak of FMD. The initial proactive culls have now been completed successfully

in all ten triplets. The effect of suspending work during the FMD emergency was initially considered by the ISG to be manageable, which meant that results from the work would only be delayed by 3–4 months. The ISG intend to review this initial assessment in 2003 and give Ministers a considered report, including an assessment of when they feel robust results from the trial may emerge.

Culling operations continued to be subject to interference from anti-trial protestors, but all were completed successfully with police assistance where required. Quarterly visits were made to a sample of badger setts in the 'survey only' areas to check for unlawful activity against badger setts. One case of digging for badgers was reported to the police.

Table A2.7: Total number of badgers caught in each triplet in completed operations as at January 2003

Triplet	Number of badgers caught		
	Proactive	Reactive	Total
A Gloucester/Hereford	204	81	285
B Devon/Cornwall	446	191	637
C East Cornwall	483	293	776
D East Hereford	293	Yet to begin (0)	293
E North Wiltshire	840	62	902
F West Cornwall	699	145	804
G Staffs/Derbyshire	632	162	408
H Devon/Somerset	393	15	219
I Gloucestershire	219	Yet to begin (0)	441
J Devon	441	Yet to begin (0)	441
Total			5,609

The RBCT is subject to independent audit and the findings are published by Defra. The areas covered are: the effectiveness of surveying for the presence of badger setts, the effectiveness of badger social group delineation and efficiency of badger trapping procedures, the humaneness of badger dispatch procedures and the statistical design of the trial itself. Further audits are planned on badger post-mortem examination and associated bacteriological culture procedures.

Badger Road Traffic Accident Survey

A survey of badgers found dead by the roadside or on farmland in culling trial areas is under way in seven English counties (Cornwall, Devon, Dorset, Gloucestershire, Herefordshire, Shropshire and Worcestershire). Survey data on the prevalence of TB in badgers found dead will be validated by reference to data from the RBCT. The number of carcasses suitable for post-mortem collected during 2002 totalled 725. Since June 2002, the collection and delivery of badger carcasses for post-mortem examination has been operated by contractors.

General TB research

In addition to the RBCT, a comprehensive research programme across a range of key areas was started. The programme included pathogenesis, immunology, genomics, vaccines, diagnostics, wildlife reservoirs, disease modelling, risk assessment and economic analysis. The amount spent on research will vary from year to year; in the 2002/03 financial year, 30 projects were carried out at a cost of £7.3m.

TB vaccine research

The key objectives of the research are: to produce vaccine candidates, to develop a test to differentiate vaccinated animals from infected animals and to evaluate the vaccine candidates in the host species.

Defra sought advice from the ISG and other experts on bovine TB on the scientific content and quality of this programme. The ISG set up a Vaccine Scoping Study Sub-Committee to advise Defra Ministers on the feasibility of a TB vaccination strategy for either cattle or wildlife. The Sub-Committee's remit also includes considering future research requirements in addition to those already in place, and will report to Ministers in the first half of 2003.

In addition to the Scoping Study, a Departmental Committee was set up to consider the administrative and legal approval processes that would be necessary to allow a vaccine to be put into use should it become available.



A comprehensive research programme into tuberculosis began in 2002

Progress of the TB pathogenesis field studies

A detailed pathological study of tuberculin test reactor cattle and cattle with close contact to reactors began in April 2002. The project is designed to provide supplementary diagnostic test information and detailed post-mortem examination of 200 reactor cattle and 200 contacts over the course of three years. During the first eight months of the project, 25 reactor cattle and 36 contacts were selected for this study.

Progress on the TB99 survey

A detailed epidemiological investigation of incidents of TB in cattle was introduced in 1999, including a case control study of herds in the badger culling trial areas. The epidemiological investigation form, completed by SVS staff, is called 'TB99'. During 2002, TB99 investigations were completed for 396 (35%) of the new confirmed cases outside the culling trial

areas, and 254 (69%) of the new cases inside the culling trial areas. In addition, 35 control reports were entered on the database. From July 2002, the Agricultural Development and Advisory Service were contracted to assist with the completion of TB99 case and control reports in the culling trial areas.

VLA research: tuberculosis

A collaboration between the VLA, the Pasteur Institute and the Sanger Centre resulted in the sequencing of the *M. bovis* genome, which represents a milestone in *M. bovis* research. The sequence will allow all the genes, proteins, enzymes and antigens present in *M. bovis* to be identified rapidly. The genome sequence of *M. bovis* will therefore underpin future Defra research in the development of improved vaccines and diagnostic reagents and in improving molecular tools for studying the epidemiology *M. bovis*.

A number of promising antigens for use in the bovine gamma interferon assay to detect TB infection have been identified and patented using comparative genomics and antigen mining. A paper describing this work has been accepted for publication in the journal *Infection and Immunity*.

Employing comparative genomics to identify potential candidate antigens and testing overlapping synthetic peptides from about 30 of these antigens with Bacille Calmette Guerin (BCG)-vaccinated, *M. bovis*-infected, and control animals we were able to identify those that were highly immunogenic with potential uses as diagnostic or vaccine antigens.

TB in animals other than cattle and badgers

Although there is no routine TB testing programme of farmed deer herds in Great Britain, suspect cases of TB in all deer species must continue to be notified to the Divisional Veterinary Managers of Defra. During 2002, *M. bovis* was isolated in 11 out of 53 suspect cases of TB reported in deer in Great Britain.

Apart from cattle and deer, TB is not notifiable in other species. Nevertheless, Defra will facilitate the post-mortem examination and culture (with strain typing of isolates) of companion animals, farmed animals and wildlife (excluding badgers) suspected of having TB. This would normally follow a report of suspect clinical signs or lesions, presence of acid-fast bacilli or culture of *Mycobacterium* species in a non-Defra laboratory from a swab taken from the respiratory tract or a wound. On receipt of a report, SVS staff will arrange for the submission of such samples to VLA regional laboratories or to VLA Weybridge.

In addition to statutory submissions to VLA, Defra is funding two extensive surveys: one by the Central Science Laboratory and one by the Wildlife Conservation Research Unit at Oxford University. The aim of these projects is to establish the prevalence of *M. bovis* infection of wildlife species other than badgers.

Table A2.8 gives the geographical distribution of cases of bovine TB confirmed during the year in species other than cattle and badgers. The results reported in this table exclude the findings of the Central Science Laboratory survey and the Oxford University study mentioned above, which are still under way.

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Table A2.8: TB in species other than cattle and badgers in Great Britain

Species	Number of animals examined for suspect TB	From which tissues were cultured	Of which positive for <i>M. bovis</i> ^a	Origin of the positive animals
Red deer				
Park	8	8	2	Staffordshire
Farmed	18	17	7	Cumbria
Wild	4	4	2	Devon and Somerset
Fallow deer	5	4	0	–
Roe deer	10	8	0	–
Muntjac	1	1	0	–
Chinese water deer	7	7	0	–
Dog	3	2	1	Gloucestershire
Cat	9	8	2	Gloucester & Wiltshire
Pionus parrot	1	1	0	
Pig	3	2	1	Wiltshire
Sheep	2	2	1	Wiltshire
Goat	1	1	0	–
Water buffalo	1	1	0 ^b	Carmarthenshire
Guanaco cross	1	1	0	–
Alpaca	1	1	0	–
Stoat	1	1	0	–
Mole	1	1	0	–
Raccoon	1	0	–	–
Sable antelope	1	1	0	–
Elephant	3	3	0	–
Total	82	74	16	

a Three deer cultures (from 1 farmed red, 2 fallow) were still outstanding at the time this table was collated.

b Culture results for the water buffalo were also outstanding. The animal in question had a positive reaction to the tuberculin test and typical lesions of TB were found on post-mortem examination. Therefore, it is highly likely that the bacteriological culture will yield a positive result for *M. bovis*.

Chapter A3 Pet Travel Scheme (PETS)

The Pet Travel Scheme enables cats and dogs to enter or re-enter England from certain countries without quarantine provided they meet the Scheme rules. The Scheme was launched in February 2000 and initially covered pets travelling from 22 countries in western Europe.

Countries added to the Scheme

The Scheme was extended in January 2001 to 28 more countries and territories around the world. In May 2002, Bahrain was included and, in December 2002, the Scheme was extended to include continental USA and Canada.

Qualification

To travel, animals must first be microchipped, then vaccinated against rabies and blood-tested at a laboratory recognised by Defra. The owner is then required to obtain an official PETS certificate. They will also need an official certificate to show the pet has been treated against ticks and tapeworms between 24 and 48 hours before being checked in for

Table A3.1: List of PETS qualifying countries

Andorra	Germany	Netherlands
Antigua & Barbuda	Gibraltar	New Caledonia
Ascension Island	Greece	New Zealand
Australia	Guadeloupe	Norway
Austria	Hawaii	Portugal
Bahrain	Iceland	San Marino
Barbados	Italy	Singapore
Belgium	Jamaica	Spain
Bermuda	Japan	St Helena
Canada	La Réunion	St Kitts & Nevis
Cayman Islands	Liechtenstein	St Vincent
Cyprus	Luxembourg	Sweden
Denmark	Malta	Switzerland
Falkland Islands	Martinique	United States of America
Fiji	Mauritius	Vanuatu
Finland	Mayotte	Vatican
France	Monaco	Wallis and Futuna
French Polynesia	Montserrat	



All eligible pets must be microchipped for identification

travel to England. The owner must also sign a form to declare that the pet has not been outside any of the qualifying countries for the scheme within the last six months. An animal cannot enter England until six months have elapsed from the date the blood sample (giving a successful test result) was taken.

To enter England under the Scheme, pets must travel on specified routes with an approved transport company. At the end of 2002 there were 26 different transport companies authorised to bring pets into England under the Scheme, on 100 different routes. It is hoped that more routes and companies will be added in the future.

Pets must enter England as the devolved administrations have not made legislation implementing similar pet travel schemes in Scotland, Wales and Northern Ireland. After a pet has entered England under the PETS it is free to move to any other part of the UK as well as the Channel Islands, the Isle of Man and the Republic of Ireland.

From the start of the Scheme to the end of December 2002, 81,002 animals (71,153 dogs and 9,849 cats) successfully entered

England under PETS. In 2000, 14,584 animals entered under the Scheme. The figures for 2001 and 2002 were 26,722 and 39,696 respectively.

PETS checks

Of all animals presented under the scheme, 8% have failed their PETS checks. The figure for the last quarter of 2002 was 6%. The main problem encountered by pet owners relates to the requirement for tick and tapeworm treatment. Other problems included incorrect rabies certification. The majority of pets that failed their check were able to continue their journey after visiting a veterinarian or having waited a short time for the required 24 hours to elapse following the tick and tapeworm treatment.

PETS information

More information and fact sheets are available on the Defra website at www.defra.gov.uk/animalh/quarantine/index.htm or from the PETS helpline (phone: 0870 241 1710, 8:30 a.m. to 5 p.m. Monday to Friday; fax 020 7904 6206).



One of the PETS logos – 'My name is Fluffy'

Chapter A4 Consumer protection

Zoonoses are diseases and infections that can spread naturally between animals and people. People may become infected by a variety of routes including contaminated food and water (foodborne and waterborne), direct contact with the animal, and through insect vectors. Successful management of the risks to public and animal health posed by zoonoses requires close collaboration between all those involved in managing animal health, producing food, safeguarding public health and the environment.

The main aims are to reduce the risk of transmission of infection from live animals to people and other animals by provision of:

- surveillance for zoonotic agents;
- statutory control measures where required by the EU and scientifically justified;
- best available advice on prevention, good husbandry, management and control;
- research to fill in gaps in knowledge;
- close liaison with the authorities dealing with the food chain and public health.

In relation to human disease it was encouraging to note a report that used five separate criteria to assess the levels of indigenous foodborne disease in England and Wales between 1992 and 2000. This concluded that overall illness in humans fell by more than half during the period (Gut 2002, 51 832–841).

UK Zoonoses Group

The UK Zoonoses Group was formed in 2001 and has the following remit:

- to provide an overview and means of ensuring overall coordination of public health action at the national and local

level with regard to zoonotic infections and antimicrobial resistance to those infections in animals and humans;

- to advise Ministers of Agriculture and Health on important events in the field of zoonoses including, where necessary, preventative and curative action;
- to promote and facilitate activity leading to better understanding on zoonoses and public health;
- to ensure exchange of views within central and local government, update on developments in the field and provide contact points for discussion.

The UK Zoonoses Group held two meetings during 2002 in April and October. Topics of interest to the group during the year were the Chief Medical Officer's infectious disease control strategy, West Nile virus, multi-resistant strains of *Salmonella newport* and the two pig diseases: porcine dermatitis nephropathy syndrome and porcine multi systemic wasting syndrome. The Defra and Department of Health Liaison Group functions that deal with *Mycobacterium bovis* in animals and man were transferred to the UK Zoonoses Group. Information on these meetings is available at: www.defra.gov.uk/animalh/diseases/zoonoses

Zoonoses

Defra supported an International Conference on 'Zoonoses: from Science to Policy' in October 2002, along with support from the Public Health Laboratory Service, DH, National Assembly for Wales and the European Society for Emerging Infections, to discuss the application and contribution of science and the multidisciplinary approaches to the development and formulation of control strategies in the public health arena.

Discussions on the proposal from the European Commission to intensify monitoring and control of zoonoses, which is expected to replace the current Directive 92/117, continued throughout the year both in Brussels and with interested parties. A common position was reached at Agriculture Council in November 2002 and the proposal will now return to the European Parliament.

In order to assist the FSA to achieve its target to reduce foodborne illness by 20% over five years, Defra was actively involved in a number of groups set up by the FSA to reduce the levels of *Salmonella* and *Campylobacter* in the food chain. Funding continues into research to improve understanding of the pathogenesis of both organisms, and research on-farm into ways in which infection of poultry flocks could be reduced or prevented.

The *Zoonoses Report UK 2000* was published, giving an overview of Zoonoses in the United Kingdom. It was the third such annual report and was produced in collaboration with a large number of organisations. The same group of organisations met during 2002 and the *Zoonoses Report UK 2001* will be published early in 2003. These reports aim to be useful to the professionals who deal with zoonotic

diseases, and also to the non-specialist who wishes to have an insight into zoonoses, their prevalence and importance.

Salmonella

All laboratories are required to report details of the isolation of salmonella from samples taken from animals, their environment and feed, as defined in the Zoonoses Order 1989. These data are collated, analysed and published annually in *Salmonella in Livestock Production in Britain*. The publication for 2002 will be available in the summer of 2003.

Multiple-antimicrobial-resistant *Salmonella newport*

During the year multiple-antimicrobial-resistant strains of *Salmonella newport* were reported to be causing concern in the United States. The strains were resistant to ampicillin, chloramphenicol, streptomycin, sulphonamides and tetracyclines, and in addition often had intermediate or full resistance to third-generation cephalosporins (ceftriaxone). Many of the strains were also resistant to other antimicrobials such as kanamycin, potentiated sulphonamides and gentamicin. The strain was reported to cause significant clinical disease in livestock, particularly cattle. At the same time an increase in the number of cases of this particular strain in people in the USA was reported.

S. newport is isolated from livestock in the UK each year at a relatively low level. A check on archive material indicated that this USA strain of *S. newport* has not been recorded in the UK. Contact with other laboratories indicated that the strain was not known to be present in other Member

States. Molecular studies were conducted to compare the USA strain with UK strains of multi-antimicrobial-resistant *S. newport* and to refine identification techniques in collaboration with the Public Health Laboratories Service and the VLA.

A risk assessment to consider both the risk of importing the USA strains of *S. newport* into the UK and the risk of widespread dissemination within UK livestock was commissioned and carried out by the VLA. In the light of the results of the risk assessment and discussions with relevant government departments and agencies including DH and the FSA, contingency plans are being drawn up to consider risk management measures should this strain of *S. newport* be detected in the UK. Enhanced surveillance has been

put in place to detect the USA strain, and veterinary surgeons, laboratories, feed importers, and animal feed manufacturers were alerted in June to the potential risk to public and animal health.

Salmonella in poultry

The statutory monitoring of breeding flocks of domestic fowl for *Salmonella enteritidis* and *Salmonella typhimurium* continued during 2002, in line with the requirements of European Commission (EC) Directive 92/117. No suspected incidents of either organism were recorded in this breeding sector.

The success of the Government control programme supported by the industry is illustrated below

Figure A4.1: Reported incidents of suspected *Salmonella enteritidis* and *Salmonella typhimurium* infection in broiler breeders in Great Britain 1989–2002

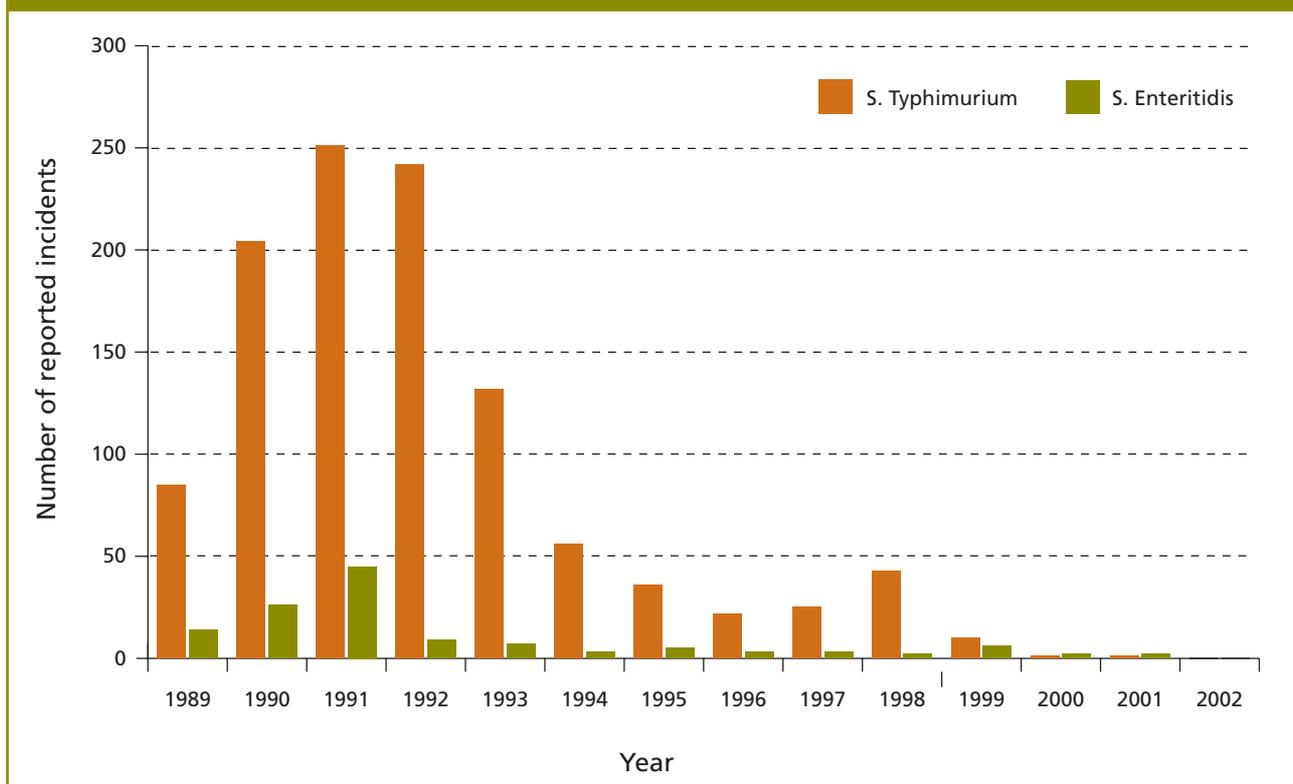
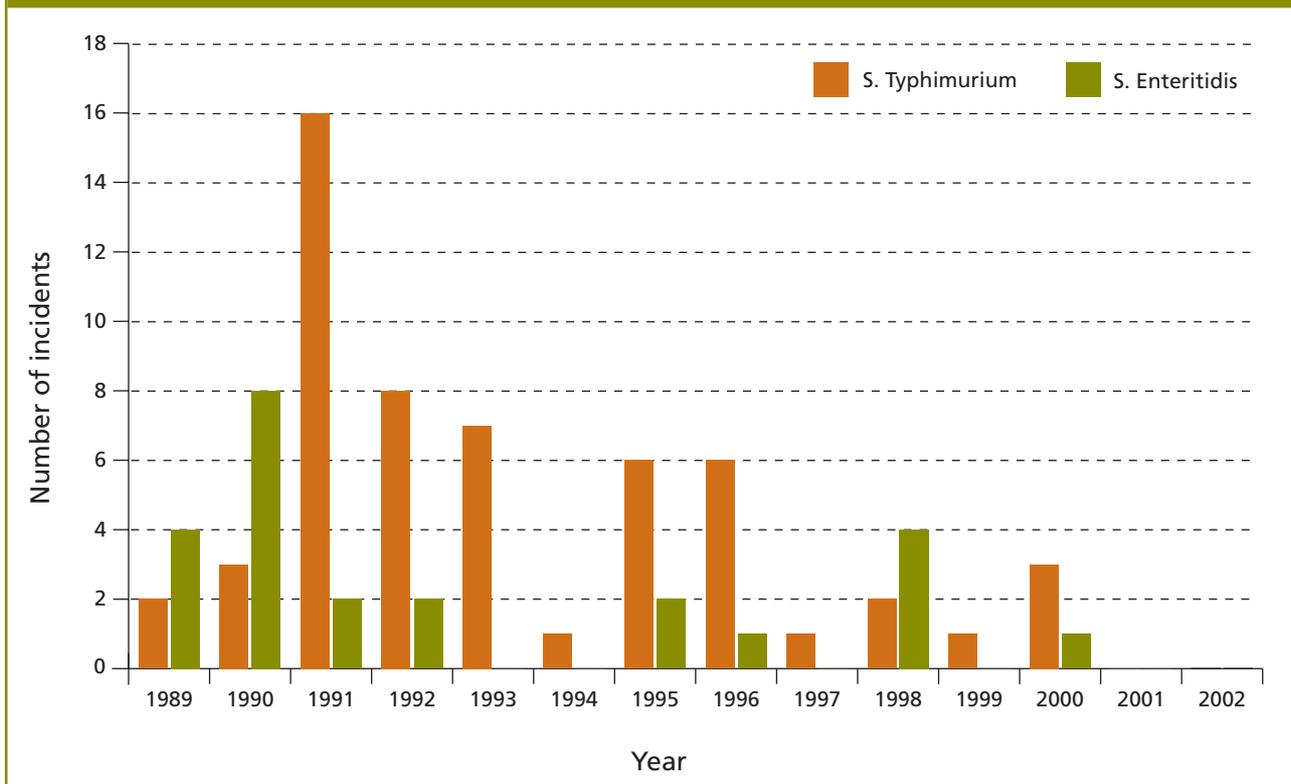


Figure A4.2: Reported incidents of suspected *S. enteritidis* and *S. typhimurium* infection in layer breeders in Great Britain 1989-2002



As a result of industry monitoring broiler flocks, usually from samples taken at 3–4 weeks of age, four *S. enteritidis* incidents were recorded and the number of *S. typhimurium* reports were 30, similar to the 46 reported in the previous year. The most common serotypes isolated from broilers or their environment were *S. livingstone* and *S. senftenberg*.

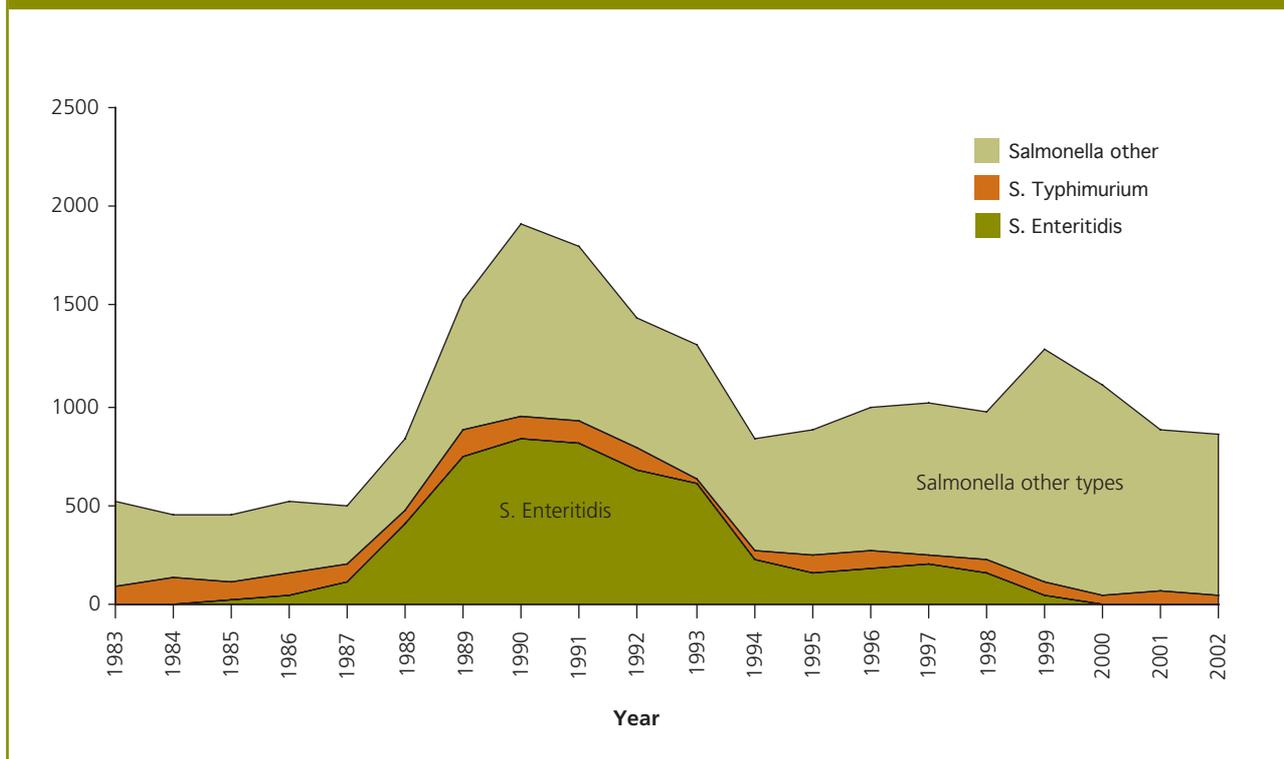
Defra published the *Code of Practice* for the prevention and control of salmonella in chickens reared for meat on farm. The *Code of Practice* was drawn up in consultation

with the Agricultural Departments in the UK, the FSA, the British Poultry Council, the British Veterinary Poultry Association and the National Farmers Union. The Code is available at:

www.defra.gov.uk/animalh/diseases/zoonoses and provides advice on preventing the introduction of infection, monitoring the salmonella status of the flock, and cleaning and disinfection at depopulation.

The marked decline in *S. enteritidis* in domestic fowl in recent years continued in 2002.

Figure A4.3: The decrease of *Salmonella enteritidis* in domestic fowl in Great Britain 1983–2002



Salmonella in cattle

Once again *Salmonella dublin* was the most common serotype reported in cattle, and continued to remain of low public health significance. *S. typhimurium* remained the second most commonly reported serotype.

Salmonella in pigs

S. typhimurium (mainly definitive type 104) continued to be the most common serotype reported in incidents in pigs. During the year, the Meat and Livestock Commission launched its Zoonoses Action Plan, which is aimed at reducing the prevalence of salmonella in finishing pigs. Defra will support the plan through further research and advice to those farmers who have a high prevalence level of salmonella in their pig herds.

Salmonella in sheep

During 2002, *Salmonella arizonae* (serovar 61:k:1,1,5,7), most often associated with ovine abortion, continued to be the most common salmonella isolated in sheep.

Salmonella in feedingstuffs

The levels of salmonella in feedingstuffs remain similar to those reported in previous years (Table A4.1). The most common serotypes found in feed materials were *S. mbandaka*, *S. agona* and *S. senftenberg*. Two salmonella serotypes of public health significance, *S. typhimurium* and *S. enteritidis* are isolated very rarely from finished feed (Table A4.1). In 2002, *S. typhimurium* was isolated once from finished pig feed and on five occasions from feed materials.

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S. enteritidis was not reported in any finished feed or feed materials. Follow-up contact with the manufacturers of feed indicated that where salmonellas were isolated, either from finished feed, or feed materials, it was

common practice to clean the production line and carry out additional sampling at critical control points in order to ensure that further batches were not contaminated.

Table A4.1: The levels of salmonella in feedingstuffs in Great Britain

Product	No. of Tests		No. of tests positive		Proportion of tests positive (%)	
	2001	2002	2001	2002	2001	2002
Processed animal protein at British protein premises	4,482	3,318	106	41	2.4	1.2
British and imported processed animal protein arriving for feedingstuffs use	953	967	27	33	2.8	3.4
Linseed meal, rapeseed meal, soyabean meal and sunflower meal at a British crushing premises and other tests on oilseed meals and products for feedingstuff use	10,361	6,035	245	258	2.4	4.3
Non-oilseed meal vegetable products	10,310	4,308	209	26	2.0	0.6
Pig and poultry meals	3,968	4,034	44	54	1.1	1.3
Poultry extrusions	4,832	5,183	19	24	0.4	0.5
Pig extrusions	1,599	2,057	8	12	0.5	0.6
Ruminant concentrates	1,985	2,336	21	23	1.1	1.0
Protein concentrates	593	726	6	12	1.0	1.6
Minerals/others	1,548	641	11	0	0.7	0.0

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Table A4.2: Isolations of *S. enteritidis* (SE) and *S. typhimurium* (ST) from all feedingstuffs and feed materials being monitored under Defra Codes of Practice in Great Britain (January – December 2002)

Type of material	1995		1996		1997		1998		1999		2000		2001		2002	
	SE	ST	SE	ST	SE	ST										
Finished feeds	2	20	0	18	2	7	0	8	0	7	0	9	2	4	0	1
Animal protein	0	1	0	10	0	2	0	0	0	1	0	2	1	0	0	0
Vegetable material	4	10	5	6	0	9	0	9	1	9	1	3	0	3	0	5
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	1	5	1	2	1	6	2	3	1	1	1	3	0	2	0	0
Total	7	36	6	36	3	24	2	20	2	18	2	17	3	9	0	6

Assistance to health authorities

When requested, Defra continue to provide assistance to health authorities investigating outbreaks of zoonotic pathogens in humans. Normally this would be when the food source was linked to a particular farm. Investigation and sampling of animals on the farm may be of value in confirming that the source of the outbreak has been identified.

Vero-cytotoxigenic *Escherichia coli* (*E. coli*) O157 (VTEC O157)

Investigations into an outbreak of *E. coli* O157 in people associated with an open farm in East Anglia implicated wild rabbits as a novel vector for the infection, probably from a nearby cattle farm. The examination of rabbit faeces will be included in future outbreak investigations as appropriate.

Campylobacter

Work continued on gaining a better understanding of the pathogenesis of campylobacter. A large research project involving a number of collaborators was funded and approved to carry out

epidemiological studies and develop practical control measures for campylobacter in broiler flocks.

Cryptosporidium

Good progress was made in the studies on transmission of cryptosporidium into animals. Eight isolates of genotype 1 (normally associated with human infection only) were transmitted into lambs, four isolates into calves and three isolates into piglets. By microscopy four lambs, two calves and one piglet were positive for *Cryptosporidium parvum* and are currently being genotyped. This work is part of a research project to study the potential for human isolates of different genotypes of *C. parvum* to infect and be excreted by farm animals.

Chemical food safety

The VLA assisted the FSA to protect the food chain in dealing with 41 chemical food safety incidents. The majority of chemical incidents were cases of lead poisoning, most of which occurred at turn-out in spring and early summer. There were a number of incidents

of exposure to or poisoning by pesticides, including metaldehyde, arsenic and bromodiolone anticoagulant rodenticide.

A large outbreak of suspected botulism affecting 141 of a herd of 164 dairy cows occurred on a dairy farm. Although the source of the toxin was not identified, the combination of clinical signs, disease epidemiology and the ruling out of other differential diagnoses strongly supported an unconfirmed diagnosis of botulism. A precautionary food safety approach was taken by placing restrictions on the movement of livestock and sale of milk from the premises until 14 days after the onset of the last clinical case.

A Risk Communication Workshop was held at VLA Weybridge in May 2002 to consult with stakeholders about the recent increase in the number of copper poisoning incidents diagnosed and investigated in adult dairy cattle.

Antimicrobial resistance monitoring

A one-day conference was held in February 2002 at the National Agricultural Centre in England, in conjunction with the Department for Agriculture and Rural Development (Northern Ireland), DH and the FSA. This conference made available for the first time new surveillance results of a structured survey of foodborne and other organisms in livestock in Great Britain. This quantified the levels of antimicrobial resistance in foodborne pathogens and certain other bacterial organisms found in cattle, sheep and pigs. The results will form the baseline on which repeated surveys will build to provide trend data.



New surveillance results of a survey into foodborne and other organisms in livestock became available

The levels of antimicrobial resistance in organisms isolated from cattle and sheep at slaughter were generally low. High levels of resistance to tetracycline were found in isolates of *E. coli*, and high levels of resistance to both tetracyclines and macrolides were found in isolates of Enterococci and *Campylobacter* species recovered from pigs. In addition, 10% of *Campylobacter coli* isolates from pigs were resistant to ciprofloxacin. These figures are not unexpected and are consistent with levels of resistance found elsewhere in the world, and comparison with other similar published data suggest the levels of ciprofloxacin found in Great Britain are lower than elsewhere. In general, the resistance patterns for isolates of *Campylobacter* recovered from pigs varied from those found in human isolates, suggesting that pigs are not a major reservoir of *Campylobacter* antimicrobial resistance in humans.

Data suggests that poultry originating in the UK may not be the primary source of some drug-resistant strains of salmonella that affected humans over the same period. This suggests that, although the incidence of resistance in *S. hadar* from poultry may be regarded as unacceptably high, particularly with respect to ampicillin, streptomycin, tetracyclines and nalidixic acid, such strains do not appear to be the primary source of resistant strains of this serotype from cases of human infection.

Drug residues

The Veterinary Medicines Directorate (VMD) operates two surveillance programmes for residues of veterinary medicines in animals and animal products. The statutory programme, which implements European legislation, covers home production from primary points, including abattoirs. The non-statutory programme looks for residues primarily in imported meat, fish and honey.

Summary results of the VMD's surveillance in 2002 have been published quarterly in the VMD's Medicines Act Veterinary Information Service (MAVIS) newsletter and is available online at www.vmd.gov.uk. Officers from the SVS collected samples on-farm for the 2002 statutory programme. They also undertook follow-up investigations at farms where positive residues had occurred, checked on-farm medicine records and advised farmers on how further residues could be avoided. In 2002, the collection of on-farm samples continued to be disrupted to some extent by the outbreak of FMD, and the VMD appreciates the efforts that were made to collect samples in difficult circumstances. The VMD made alternative arrangements for the collection of samples where necessary.

Section B: Exotic, endemic and new emerging disease surveillance

On 22nd January 2002, the Office International des Epizooties (OIE) restored FMD-free country without vaccination status for the purposes of international trade. This announcement marked the beginning of the end of the FMD epidemic.

The Chief Veterinary Officer, as the head of the Competent Authority in Great Britain has overall responsibility for veterinary surveillance within Great Britain. Our ability to detect the emergence of a new or exotic disease condition rests upon a good awareness of the usual disease status of the animal population provided by high quality veterinary surveillance. Surveillance is also needed in order to manage risks associated with disease and to help protect public health, animal health, welfare and trade.

Chapter B1: Background

The Surveillance Group on Diseases and Infections in Animals plays an important role in coordinating surveillance programmes of animal health and welfare on farms, including pathogens of both animal and human health significance. Its membership includes representatives of the Agriculture Departments, the FSA and DH.

Early in 2002, a new Veterinary Surveillance Division within Defra was established with responsibility for developing and implementing a Veterinary Surveillance Strategy. After a series of stakeholder meetings, a draft comprehensive strategy was published for a three-month consultation period towards the end of the year. Five strategic goals were identified:

- 1** strengthen collaboration with stakeholders;
- 2** develop a prioritisation process;
- 3** derive better value from surveillance information and activities;

- 4** share information more widely;
- 5** enhance the quality assurance of surveillance outputs.

An executive summary of the strategy can be found in the appendices of this report.

Surveillance

Implementing testing programmes for systematic surveillance is a function of the SVS. This is supported by a network of laboratories (VLA in England and Wales; Scottish Agricultural College in Scotland) with contractual arrangements to provide both the necessary test facilities, and to carry

out surveillance on material submitted for diagnosis by private veterinary surgeons (casework). Casework is a vital component in helping to achieve many of the objectives of veterinary surveillance, including detecting new or exotic diseases. In addition, the laboratory network provides the necessary infrastructure to enable structured surveys to be carried out.

Further support is provided by the Meat Hygiene Service which contributes significantly to the surveillance network. Routine ante-mortem and post-mortem inspections at abattoirs provide important scanning surveillance, and their staff collect samples for a variety of targetted surveillance projects.

Information on diagnoses and submissions from all parts of Great Britain are recorded, collated and analysed by the VLA in the Farmfile database and published annually in the *Veterinary Investigation Diagnosis Analysis handbook*, in the *Salmonella in Livestock Production* booklet, and in this Report. The database also contributes to the UK Zoonoses Report. Further information on surveillance in relation to specific animal diseases is covered in other sections of this Report.

Research

Defra is a strongly science-based Department which promotes and funds pertinent science to implement its current policies, to provide scientific foresight, and to contribute to the identification of future policy options. Research makes a significant contribution to achieving Defra objectives, in particular to protecting the public and the environment, and to encouraging efficient and sustainable agriculture and food industries.

In line with these objectives, Defra supports a large multi-programme body of research on animal welfare, animal health and related public health issues. The funding allocated to research in 2002/03 was £32.8 million. A wide variety of policy-related topics are included and the full current listing can be found at www.defra.gov.uk/science. Some of the major programmes are listed in Table B1.1. Research in these programmes is carried out in a range of Agencies, Research Institutes, Universities and private sector institutions. In all cases, Defra seeks to achieve high quality science and has moved incrementally to peer review and open competition. Collaboration between centres of expertise is encouraged.

During 2002/03 there was increased focus in three areas:

- 1 improved quality assurance to guarantee the validity of research output;
- 2 inter-Departmental collaboration to ensure the optimum definition of research addressing cross-cutting issues, and to promote joint-funding where possible;
- 3 the definition of horizon-scanning research that is likely to be needed to inform future policy directions.

Within the EU there is continued momentum to harmonise legislation concerning public health, animal health and animal welfare. Drafting EU Directives is guided by expert Standing Committees which may be strongly influenced by published scientific information. To assist in promoting sound science for EU decision-making, a significant number of Defra research projects are directed at providing such information.

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Table B1.1: Main veterinary science research activities and associated budget allocations for the financial year 2002/2003 (in £,000s)

Veterinary Science Programme	Includes research on	Allocation for 2002/03 (£,000s)
Statutory and exotic diseases	Bovine tuberculosis	3,769
	FMD	1,200
	Brucella	250
	Classical swine fever	250
	Rabies (and related viruses)	550
	Others	1,100
	New and emerging diseases	180
Zoonoses	<i>E.coli</i> O157	670
	<i>Salmonella</i>	987
	<i>Campylobacter</i>	560
	Other zoonoses	311
Transmissible spongiform encephalopathies (TSEs)	BSE in cattle	5,551
	TSEs in sheep	11,100
Endemic diseases and alternatives to pharmaceutical control	Bovine mastitis	265
	Non-statutory viral disease	107
	Non-statutory parasitic disease	675
	Others	1,690
Animal welfare	Animal welfare	3,595

Defra is currently involved in initiatives to promote veterinary research and ensure the availability of scientific expertise in animal health. Two of the current activities are:

- 1 Veterinary Fellowships at Liverpool, Edinburgh and Cambridge Veterinary Schools – now in their third year these are being assessed for extension;
- 2 Veterinary Training and Research Initiative; projects were initiated in 2002; Defra will provide £2m a year for the next 3–5 years – this is a joint funded initiative with the Higher Education Funding Council for England and The Scottish Higher Education Funding Council in response to recommendations of the Selbourne Report.

Chapter B2: Exotic disease

Anthrax

One positive case of anthrax, the first since 1997, was reported in October 2002. It was confirmed after investigation of sudden death in a dairy cow by a local veterinary inspector in Wrexham. Anthrax was immediately suspected, and the carcass was destroyed by incineration on the farm prior to confirmation by the VLA at Weybridge. There have been anthrax deaths in cattle on at least three previous occasions, the last being 10 years ago. There was no connection with any deliberate release.

In 2001 and 2002, local veterinary inspectors carried out 10,553 and 10,085 tests for anthrax on cattle, respectively, all of which proved negative. By law local veterinary inspectors are required to look at a range of potential diseases in any cattle that have died suddenly. An anthrax vaccine exists, but is not commonly used in Great Britain.

Table B2.1: Anthrax cases in Great Britain 1992–2002

Year	Number of investigations	Number of cases	Species	Number of animals	County
1992	8,516	2	Cattle	1/1	Derbyshire/Clwyd
1993	8,662	2	Cattle	1/4	Derbyshire/Highlands
1994	8,301	3	Cattle	3/1/1	Gloucestershire/ Isle of Wight/Wiltshire
1995	7,902	1	Cattle	1	Northamptonshire
1996	7,845	2	Cattle	2/1	Wiltshire/Gloucestershire
1997	7,424	1	Cattle	1	Lanarkshire
1998	7,405	0	–	–	–
1999	5,855	0	–	–	–
2000	5,328	0	–	–	–
2001	10,553*	0	–	–	–
2002	10,085*	1	Cattle	1	Wrexham, Wales

*The reason for this sudden increase is due to Defra writing to Local Veterinary Inspectors substantially heightening the awareness of anthrax as a potential bioterrorism agent.

Aujeszky's disease

The National Slaughterhouse Serum Survey for Aujeszky's disease has been operating since 1991 under MAFF, then Defra, to demonstrate continuing freedom from Aujeszky's disease in Great Britain. In July 2002, samples from six boars were referred to VLA Weybridge and returned positive results when subjected to a specific ELISA (enzyme-linked immunosorbent assay) test (the VLA gD AD ELISA). A traceback investigation was conducted and herds of origin of the boars were screened for Aujeszky's disease. No evidence of Aujeszky's disease was detected in any of these herds. There were no reports of suspected Aujeszky's disease in 2002.

Bluetongue

There were no reports of suspected bluetongue in Great Britain. However, during 2002 outbreaks of bluetongue reoccurred for the fifth year across southern Europe (including large numbers of outbreaks in Italy), with the loss of over 500,000 sheep. The disease continued to spread reaching further north (within eastern Europe) than ever before.

Research: identification and molecular epidemiology of bluetongue virus

The defences against bluetongue rely on accurate detection and identification of the virus to support risk assessment and to prevent its importation. Nucleotide sequence

Table B2.2: Summary of serum sampling at abattoirs in Great Britain 1987–2002

Year	Number of samples collected		Number of positive incidents
	Sows	Boars	
1987	53,655	12,117	5
1988	20,942	19,959	1
1989	38,389	17,701	5
1990	18,144	12,030	0
1991	18,239	15,196	0
1992	0	14,012	0
1993	0	13,531	0
1994	0	14,318	0
1995	0	15,132	0
1996	0	16,313	0
1997	0	14,718	0
1998	0	15,742	0
1999	0	17,749	0
2000	0	11,545	0
2001	0	1,833	0
2002	0	9,525	0

data was generated for each of the 24 bluetongue virus (BTV) serotypes, allowing new virus isolates to be distinguished and identified more accurately than before. Analysis of European strains provided valuable epidemiological data concerning virus movement (for example, indicating that European BTV-2 originated in sub-Saharan Africa, while BTV-1 came from the east, probably via Turkey). Ongoing sequencing studies will also help to distinguish and identify other related orbiviruses.

Overwintering mechanism for BTV

During 2002, BTV-9 reappeared in eastern Europe, providing further evidence of overwintering and survival of BTV in the absence of adult vector insects. Persistently infected ovine and bovine gamma delta T-cells can provide a long-term reservoir for the virus and a possible overwintering site in the mammalian host. The ability of the virus to survive through long harsh winters increases its potential to threaten additional areas of Europe.

Vector insects

Outbreaks of bluetongue also occurred in northern Italy, northwest Greece, Bosnia, Serbia, Macedonia, and Croatia, beyond the range of *Culicoides imicola* (the major vector species in Africa and southern Europe), indicating the presence of additional (novel) vector species. BTV was recently isolated in mainland Italy and Sicily from *C. obsoletus* and *C. pulicaris*, respectively – two species that are widespread across central and northern Europe, including the UK. The vector competence of different populations of these insect species is being examined.

Risk assessment for Europe

Remotely sensed data (from satellite) on local temperature, vegetation and humidity were modelled with field data for insect vector populations from southern Europe. This identified areas that will support significant populations of *C. imicola* and which therefore have a high risk of bluetongue transmission. Additional data for other European countries will be used to generate risk maps for other (novel) vector species (for example, *C. obsoletus* and *C. pulicaris*).

Climate change and temperature increases are likely to affect the distribution of *Culicoides* species, with movement north. However, high ambient temperatures are also required for BTV to replicate effectively in adult vector insects and such changes may increase the ability of existing insect populations to transmit the disease. Climate change may therefore be a significant factor increasing the threat of bluetongue in Europe, as indicated by the unprecedented and continuing outbreaks of disease in the Mediterranean region.

Bluetongue Directive

Work was undertaken during the year on implementing the Directive laying down specific provisions for the control and eradication of bluetongue (2000/75/EC). A meeting was held with industry representatives to discuss the control strategy should bluetongue enter the country, and a further meeting was held with veterinary surgeons. A Technical Review and Control Strategy were prepared: (www.defra.gov.uk/animalh/diseases/notifiable/disease/bluetongue.htm).

Brucellosis

Brucellosis of cattle

Great Britain remained free from brucellosis of cattle during 2002. It is an 'officially brucellosis-free region of the EU'. The most recent previous isolation of *Brucella abortus* from cattle in Great Britain was in 1993.

The national brucellosis surveillance programme continued with monthly bulk milk ELISA testing of all dairy herds and blood testing of beef breeding herds every two years, with approximately 50% of eligible herds blood tested each year. Reporting of all abortions and premature calvings is required, with abortion investigations carried out on the basis of risk assessment in dairy cattle and in all reported cases in beef cattle.

From March 2002, post-calving check blood testing of all imported cattle was introduced. This is facilitated by the use of the British Cattle Movement System to notify Divisional Veterinary Managers each week of imported cattle which have calved for the first time in Great Britain, or imported female cattle which require breeding history checks. Breeding history checks are required for imported heifers which reach 30 months of age without a recorded calving or adult females which do not have a recorded calving within 12 months of import.

During the year, 20,000 (100%) dairy herds were bulk milk tested and 45,000 (56%) beef breeding herds were blood tested. Three serologically positive cattle were identified and slaughtered, all were culture-negative for *B. abortus*. Bovine abortions were investigated on 7,649 occasions, all were negative for *B. abortus* and 3,750 post calving check tests of imported cattle were carried out with clear test results.

VLA surveillance: *Brucella* spp.

Since January 2000, pigs traded in the EU have not required pre-export testing, increasing the risk of the introduction of *Brucella suis* into Great Britain. A surveillance project is planned to screen porcine clinical material submitted to regional laboratories, using bacterial culture and serology to provide early warning if the disease enters the national herd.

Four of 115 samples submitted from a post-import check test on sheep imported from Belgium showed titres to the complement fixation test. Subsequent sampling showed the titres falling in some cases whereas in others they were maintained. The picture suggests infection with a cross-reacting organism or possibly animals vaccinated with Rev-1 vaccine.

The VLA agreed to collaborate on a European-funded effort to clone all genes of *Brucella melitensis*. This will lead to applications such as use of DNA arrays and screening for new vaccine determinants or diagnostic antigens.

VLA research: *Brucella*

During the last year the focus was on identifying novel vaccine candidates and producing DNA vaccine constructs. Candidate genes, identified as homologous to protect antigens and virulence factors in related pathogens, were selected from the *Brucella melitensis* genome data.



Brucella diagnostic kits being assembled

Classical swine fever and African swine fever

Great Britain remained free of classical swine fever during 2002 – the last outbreak occurred in 2000. African swine fever has never been recorded in Great Britain.

There were 11 investigations of suspected swine fever in 2002. Investigation of four of these suspect cases involved submission of diagnostic samples to National Reference laboratories: VLA Weybridge for classical swine fever and at the Institute of Animal Health at Pirbright for African swine fever. Results of each veterinary field and laboratory investigation provided the basis for ruling out suspicion of swine fever.

VLA research: classical swine fever

Infection with classical swine fever virus was shown to regulate candidate genes of the innate antiviral response (interferon α and β), using quantitative reverse transcriptase–polymerase chain reaction (RT–PCR) and ELISA. Work began on understanding the pathways involved and to study strains of differing virulence in an attempt to determine the role of this mechanism in the *in vivo* pathogenicity of classical swine fever.

Enzootic bovine leukosis

Great Britain remained free from enzootic bovine leukosis during 2002. It is an 'officially enzootic-bovine-leukosis-free region of the EU'. The most recent confirmed case of enzootic bovine leukosis was in 1996.

The national enzootic bovine leukosis surveillance programme continued with bulk milk ELISA testing of approximately 20% of dairy herds each year, each selected herd being tested twice during the year and with blood testing of beef breeding herds every four years, approximately 25% of eligible herds blood tested each year. Post-mortem inspection of all slaughtered cattle is carried out.

During the year, 5,400 (27%) dairy herds were bulk milk tested and 22,500 (28%) of beef breeding herds were blood tested. Two serologically positive cattle were identified and slaughtered, both were negative to virus isolation tests for enzootic bovine leukosis. Bovine tumour samples were submitted for examination on 62 occasions, all were negative to tests for the disease.

FMD

Independent Inquiries

The two independent FMD Inquiries commissioned by the Government published their reports in July 2002. Dr Iain Anderson's *Lessons Learned Inquiry* report sets out the major lessons from the 2001 FMD outbreak and makes a large number of detailed recommendations. It identifies three key areas for handling any outbreak: systems, speed of response and the necessity for good science as the basis of that response. The Royal Society's report on infectious diseases in livestock provides a core text on the science and control of FMD and other exotic diseases. It sets out 10 key findings and makes recommendations for future action. It also covers the scientific issues relating to the transmission, prevention and control of a number of epidemic diseases in livestock, particularly FMD.

Government response

In its response to these two Inquiries, published on 6 November 2002, the Government makes it clear that it accepts virtually all the detailed recommendations in Dr Anderson's report, and firmly endorses the lessons that he details. The recommendations made by the Royal Society will also play a major part in shaping the Government's work in this area.

The Government's response contains a wide range of commitments and actions, including a stronger general framework for emergency preparedness, with special emphasis on response and disease control in an outbreak of animal disease, and work on strengthening disease prevention. The response sets out a considerable programme of work on animal health over the coming years.

The reports of the two FMD Inquiries strongly supported the recommendation of the Policy Commission on Sustainable Food and Farming that Defra should take a more strategic approach to animal health and welfare policy; the development of an Animal Health and Welfare Strategy is described further in the introduction.

The reports by both Inquiries and the Government's Response can be found at www.defra.gov.uk/animalh/diseases/fmd/default.htm

Interim movement regimes

Animal movement controls remained in place following the FMD outbreak in 2001. The arrangements brought into force in February 2002 were deregulatory by comparison with those previously in place. They permitted more normal movements of cattle and pigs after the return to FMD-free status and also allowed cattle markets to reopen. Further deregulatory changes were made in May, July and September 2002, but the Government took the view that a return to the pre-2001 situation was not acceptable.

20-day standstill

The centrepiece of the animal movements regime was a 20-day whole farm standstill. In July 2002, the FMD Inquiries recommended that the 20-day standstill should remain in place until Defra had carried out a full risk assessment and cost-benefit analysis. Defra accepted this recommendation and commissioned these studies. The emerging findings were due to be reported in time to inform decisions on the Spring 2003 movement regime.

Policy on footpath closure and hunting

The last few footpaths on former infected premises that had been closed to prevent the further spread of the disease were reopened in September 2002. Defra's revised FMD Contingency Plan states that, in the event of a future outbreak of FMD, only footpaths within a 3 km protection zone of the outbreak would need to be closed.

The FMD hunting permit regime was modified in February 2002 to reflect the recovery of FMD-free status, and withdrawn altogether in September 2002.

Animal Health Act 2002

The Animal Health Act 2002 increased the capacity of Defra and local authorities to deal swiftly with outbreaks of notifiable disease. The key components of the Act covering potential notifiable disease outbreaks give officials new powers of entry, provide for a new additional slaughter power (preventive cull) and enshrine into law a duty on the Secretary of State to consider vaccination as an option to prevent the further spread of a notifiable disease.

Biosecurity

As identified by the two FMD inquiries, biosecurity is recognised as a key element of disease control. Advice was issued via the internet and direct mailing, and a summary leaflet was issued to farmers in August 2002. Advisory leaflets *Golden Rules for a Healthy Herd* and *Golden Rules for a Healthy Flock* dealing with the disease risks to restocking herds and flocks following FMD, were produced by VLA and Defra following up the Defra website initiative, and made available for all livestock farmers. The Animal Health Act 2002 set out a consultation process on

biosecurity guidance, which will be undertaken in 2003.

Vaccination

In responding to the FMD Inquiry reports, the Government made clear that emergency vaccination would be considered as part of the control strategy from the start of any outbreak of FMD where measures additional to culling of infected animals and dangerous contacts are needed, and this should be on the basis of vaccinate-to-live wherever possible. Although there remain scientific and practical difficulties associated with an emergency vaccination strategy, Defra is working to overcome these.

The UK acquired further commercial supplies of several FMD antigens during 2002 in addition to those procured in 2001. The SVS is undertaking ongoing work on operational requirements of an emergency vaccination programme. The EC proposed a new FMD Directive at the end of 2002, with an increased emphasis on the use of emergency vaccination. This draft Directive is currently being negotiated. It is open to consultation with stakeholders and is part of ongoing consultations with interested parties on the use of emergency vaccination as a disease control option.

Under EC rules, Member States are required to have FMD contingency plans which must cover the criteria laid out in Commission Decision 91/42. The FMD contingency plans, including those for vaccination, have been approved by the Commission.

The OIE agreed in May 2002 to changes to the minimum time required to regain FMD-free status after the use of vaccination. FMD-free status, following a vaccinate-to-live

policy, can now be regained six months after the last case or completion of emergency vaccination whichever is the later, provided surveillance, based on the detection of antibodies to FMD virus, demonstrates the absence of infection.

FMD surveillance

There were 54 investigations of suspected FMD in 2002. Investigations of five of these cases included submission of samples to the Institute of Animal Health (Pirbright) for laboratory testing. Results of each veterinary field and laboratory investigation provided the basis for ruling out suspicion of FMD.

Defra-funded research on FMD

Defra supports a substantial programme of research on FMD, costing approximately £1.2 million per annum. The research is undertaken at the Institute for Animal Health (Pirbright), which is the World Reference Laboratory for FMD. The research and development sponsored by Defra is fully reported upon by the Institute, and further information can be found at www.iah.bbsrc.ac.uk.

The current programme covers a number of key areas, each of which support Defra policy regarding the control of FMD.

Molecular structure

Studies are in place to examine the role of molecular interactions between virus and host cells, particularly the role of cellular receptors. This should provide information applicable to vaccine design, such as differences between viral isolates regarding host range and virulence and antigenic changes in virus.

Improved diagnosis

Continued work on the development of diagnostic technology is essential to Defra. Several techniques, including PCR technology, are being developed to provide rapid, accurate diagnostic information. The use of serological tests to identify vaccinated livestock that carry FMD will provide a basis for differential diagnosis. Studies to examine the lesion profile in sheep will provide information to aid in clinical diagnosis.

Epidemiology and pathogenesis

Several studies are underway to help elucidate our understanding of the pathogenesis and epidemiology of FMD, including:

- a genetic study of FMD outbreak strains to facilitate tracing the origin of disease and to provide information on the risk of introduction into the UK;
- pathogenesis studies to examine the kinetics of infection, transmission and viral persistence in different livestock species which will provide valuable information in terms of understanding the behaviour of the virus in an outbreak.

Much of the research described not only addresses specific issues, but also provides an integrated programme to advise Defra on its FMD control policies.

Proposals for research and development

Defra's continued support of existing and new research forms a comprehensive programme which covers several aspects of FMD. New research will be focusing on the diagnosis of FMD infection, with emphasis on the development of new technologies.

Section B – Chapter B2

Table B2.3: Last recorded outbreaks of notifiable disease in Great Britain

Disease	Animals affected	Last occurred in Great Britain
African horse sickness	Horses	Never
African swine fever	Pigs	Never
Anthrax	Cattle and other mammals	1997
Aujeszky's disease	Pigs and other mammals	1989
Avian influenza (fowl plague)	Birds	1992
BSE	Cattle	2001
Bluetongue	Sheep and goats	Never
Brucellosis (<i>Brucella abortus</i>)	Cattle	1993
Brucellosis (<i>Brucella melitensis</i>)	Sheep and goats	1956
Classical swine fever	Pigs	2000
Contagious agalactia	Sheep and goats	Never
Contagious bovine pleuropneumonia	Cattle	1898
Contagious epididymitis (<i>Brucella ovis</i>)	Sheep and goats	Never
Contagious equine metritis	Horses	2002
Dourine	Horses	Never
Enzootic bovine leukosis	Cattle	1996
Epizootic haemorrhagic virus diseases	Deer	Never
Epizootic lymphangitis	Horses	1906
Equine viral arteritis	Horses	1998
Equine viral encephalomyelitis	Horses	Never
Equine infectious anaemia	Horses	1976
FMD	Cattle, sheep, pigs and other cloven hooved animals	2001
Glanders and farcy	Horses	1928
Goat pox	Goats	Never
Lumpy skin disease	Cattle	Never
Newcastle disease	Birds	1997
Paramyxovirus of pigeons	Birds	2002
Pest des petits ruminants	Sheep and goats	Never
Rabies	Dogs and other mammals	1970*
Rift Valley fever	Cattle, sheep and goats	Never
Rinderpest (cattle plague)	Cattle	1877
Scrapie	Sheep and goats	2001

Table B2.3: Last recorded outbreaks of notifiable disease in Great Britain (continued)

Disease	Animals affected	Last occurred in Great Britain
Sheep pox	Sheep	1866
Swine vesicular disease	Pigs	1982
Teschen disease	Pigs	Never
Tuberculosis (bovine TB)	Cattle and goats	2001
Vesicular stomatitis	Cattle, pigs and horses	Never
Warble Fly	Cattle, deer and horses	1990

* European bat lyssavirus is a rabies-related virus – the incidents of this disease in Great Britain in 2002 do not compromise the rabies-free status.

This will enable rapid and specific disease diagnosis while existing programmes will continue to explore the future development of effective vaccines against the causative FMD agent/virus.

Research will also be addressing disease surveillance and epidemiology, investigating the origins of the disease and increasing our knowledge of the global spread of the virus. This will make it possible to implement effective control measures and contingency plans. Such work will augment the Institute of Animal Health's status as World Reference Laboratory for FMD (as designated by Food and Agriculture Organisation of the UN and the OIE).

Horse diseases

Contagious equine metritis

After a long period of freedom from contagious equine metritis (CEM), *Taylorella equigenitalis*, the causal agent of CEM, was discovered in two animals on two separate premises. Four swab samples were taken in October 2002 and found to be positive for *T. equigenitalis*. They were taken from a Selle Français stallion as part of the evaluation of semen collections that were to be

subsequently exported. This was the first CEM isolate in Great Britain since 1997.

A tracing exercise showed that the stallion had been imported from Germany earlier in the year, reportedly testing negative prior to entry into Great Britain. Subsequent restrictions under the Infectious Diseases of Horses Order 1987 were placed on 24 'at risk' stallions and mares. Of the tracings, only one was found to be CEM-positive – a mare served by the infected stallion. No clinical signs were observed. Further swabs taken since have proven negative.

The Industry Code of Practice was effective in detecting and limiting CEM outbreaks and will continue to be the first line of management of CEM within Great Britain. The option to utilise statutory powers will also continue to be used if required.

The lessons learnt from the 2002 CEM outbreak include:

- CEM is a continuing problem related to mainland Europe Warmblood (Warmblut) stallions – this is also the experience in the USA;

- adequate swabs from both mares and stallions and good microbiological standards are necessary;
- the requirement that stallions intended to have semen collected for the purposes of artificial insemination (AI), both chilled or frozen, have screening for CEM and equine viral arteritis in advance of collections should be retained; the use of AI in horses has become very popular in recent years;
- the requirements for equine AI collection centres laid down by third countries, trade regulations, and domestic codes must be followed; and
- any future review of the Infectious Diseases of Horses Order and the Horserace Betting Levy Board Code of Practice should take into account the increased use of AI in horses, and the international movement of horses and equine semen.



Contagious equine metritis was discovered for the first time since 1997

Equine viral arteritis

The UK continued to be free of equine viral arteritis in 2002. The Equine Viral Arteritis 1995 Order and the Horserace Betting Levy Board Code of Practice continues to be the means of controlling this disease in the UK. Blood samples taken under the Horserace Betting Levy Board Code of Practice are submitted for equine viral arteritis serology and seropositives are investigated as to their vaccination status, sex, and recent mating history.

Seropositive stallions without a proven vaccination history are placed under restrictions provided by the Equine Viral Arteritis Order 1995. If the stallion is not gelded, then semen samples are tested by conventional virus isolation and RT-PCR. If the latter tests produce positive results, the stallion remains under restrictions until it is either certified gelded or it has a test mating with two seronegative mares supervised by a Veterinary Surgeon, with no subsequent seroconversion.

Poultry diseases

VLA surveillance: Newcastle disease

Support was given to the Danish National Laboratory investigating an epidemic of Newcastle disease in commercial and backyard flocks.

VLA research: Newcastle disease

Promising results were obtained on the continuing approach to develop an in-vitro assay for virus pathotyping. The ligase chain reaction was able to differentiate virulent from avirulent viruses reliably. It could also detect mixed populations of these two virus

pathotypes in the same preparation, which is not possible using existing techniques. The presence of 'live' vaccine strains can sometimes interfere when detecting virulent field strains using current methodology. Ultimately it is hoped that this technique may offer a real alternative to the use of in-vivo tests for determining virus pathotype.

VLA research: avian influenza

Results from a collaborative study with the Danish State Veterinary Laboratory confirmed that ostriches are resistant to avian influenza viruses that cause highly pathogenic disease in chickens. The excretion of virus virulent for chickens from clinically normal ostriches represents an important consideration in the movement of such birds from one location to another.



Ostriches were found to be resistant to avian influenza viruses that cause a highly pathogenic disease in chickens

The International Reference Laboratory for avian influenza was directly involved with investigations into the occurrence of highly pathogenic avian influenza in Chile and infections with H9N2 influenza virus causing acute economic problems in the Middle East. In the case of the former, this has resulted in the identification of a virus with novel genetic characteristics associated with virulence, leading to clear evidence for the mechanisms whereby an avirulent virus acquired virulence.

Warble fly

During February 2003, the VLA screened 84,480 samples for warble fly. Of those screened, 1334 needed further titrating and 95 of those titrated needed confirmatory testing by competitive ELISA. All were found to be negative.

Section B – Chapter B2

Table B2.4: Summary of statistics of the principal animal and poultry diseases in Great Britain 1997–2002

	1997	1998	1999	2000	2001	2002
Anthrax						
Counties involved	1	–	–	–	–	1
Confirmed cases	1	–	–	–	–	1
Cattle deaths	1	0	0	0	0	1
Aujeszky's disease						
Counties involved	–	–	–	–	–	–
Outbreaks	0	0	0	0	0	0
Avian influenza						
Counties involved	–	–	–	–	–	–
Outbreaks	–	–	–	–	–	–
Birds slaughtered	0	0	0	0	0	0
BSE						
(a) Passive surveillance*						
Counties involved	64	62	60	62	62	56
Animal deaths – cattle	5,313	4,046	2,857	1,798	1,153	813
Confirmed cases (by histopathology)	4,847	3,445	2,677	1,541	1,095	450
(b) Active surveillance*						
Counties involved	–	–	–	–	–	75
Confirmed cases (by histopathology)	–	–	–	–	–	594
Contagious equine metritis						
Counties involved	2	–	–	–	–	2
Confirmed cases	2	0	0	0	0	3
Enzootic bovine leukosis						
Counties involved	–	–	–	–	–	–
Outbreaks	–	–	–	–	–	–
Number of reactors	0	0	0	0	0	0
Equine viral arteritis						
Counties involved	3	1	–	–	1	–
Outbreaks	3	2	0	0	1	0

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**Table B2.4: Summary of statistics of the principal animal and poultry diseases in Great Britain
1997–2002 (continued)**

	1997	1998	1999	2000	2001	2002
FMD						
Counties involved	–	–	–	–	32	–
Outbreaks	–	–	–	–	2,026	–
Animals slaughtered	0	0	0	0	4,220,000	0
Newcastle disease						
Counties involved	6	–	–	–	–	–
Outbreaks	11	–	–	–	–	–
Birds slaughtered	648,000	0	0	0	0	0
Paramyxovirus of pigeons						
Counties involved	12	10	22	12	16	17
Outbreaks	17	18	36	27	20	19
Scrapie						
Counties involved	46	48	43	44	36	204**
Confirmed cases	508	500	593	606	302	579**
Classical swine fever						
Counties involved	–	–	–	3	–	–
Outbreaks	–	–	–	16	–	–
Animals slaughtered	0	0	0	74,793	0	0
Swine vesicular disease						
Counties involved	–	–	–	–	–	–
Outbreaks	–	–	–	–	–	–
Animal slaughtered	0	0	0	0	0	0
Warble fly						
Counties involved	–	–	–	–	–	–
Outbreaks	–	–	–	–	–	–

* There are different reporting boundaries for Passive and Active surveillance

** There are still some 2,002 cases awaiting completion

Chapter B3: Scanning surveillance for new and emerging diseases

New or exotic diseases, or changes in the effects of endemic diseases, can be detected by appropriate examination of material submitted for diagnosis to veterinary laboratories. Material in this chapter is derived from the regular surveillance reports provided by the VLA.

Cattle

The year 2002 was a difficult one for cattle farmers – the low milk price affected dairy farms, and TB movement restrictions affected both milk and beef farms alike.

An exceptionally wet spring delayed turnout and allowed grass swards to become over-mature. Forage maize crops suffered through poor germination followed by excessive leaf growth at the expense of cobs. Conserved forage made throughout the year varied greatly in both quality and quantity.

The climatic conditions also favoured endoparasites. Fasciolosis continued to spread into areas where previously not encountered. Parasitic gastroenteritis was a significant problem in 6- to 24-month-old animals on many farms. Increasing resistance to anthelmintics, particularly the benzimidazoles, posed particular problems for some organic producers. The retention of older cows in many dairy herds resulted in increased infertility and mastitis problems.

Bovine viral diarrhoea type 2 virus

Bovine viral diarrhoea (BVD) type 2 virus was isolated for the first time in Great Britain in October 2002. Until then the strain in Great Britain was 1A with a seropositive prevalence of 95%. The infected animal was a nine-month-old Holstein bull calf imported from

North America as an embryo. Examinations of contemporaries from this herd and related embryos have so far revealed one further animal persistently infected with BVD type 2 virus.

If no further persistently infected animals exist in Great Britain, the expectation is of a slow spread, or even possible disappearance, as there is a high level of BVD herd immunity in British herds. Further investigations continue to identify the most likely mechanism of introduction which enables safeguards to be increased to prevent any further similar occurrences. Enhanced surveillance for this strain has been instituted, particularly targeting acute BVD episodes and persistently infected animals born to imported cattle from both North America and Europe, as this strain is also present in Europe.

Coccidiosis

Examinations of oocysts from clinical cases throughout the year revealed 45% to be *Eimeria bovis*, 35% *E. zuerni* and 20% *E. alabamensis*. The associated age ranges were usually 1–4 months for *E. bovis*, 2–3 months for *E. zuerni* and 3–9 months for *E. alabamensis*.

However, clinical disease was occasionally encountered in calves less than two weeks

old. This is unusual, as the pre-patent period is thought to be in the region of three weeks. Investigations into possible underlying immunosuppressive agents found none.

Johne's disease

Over the last 10 years, the number of recorded cases has increased by over 150%. Currently the ratio of diagnoses between dairy and beef cattle is 55:45 with 65% of all diagnoses being in animals four years or older. However, clinical disease is now occasionally being encountered in animals as young as 18 months of age.

Johne's disease has predictably proven to be a serious problem in some post-FMD restocked herds where little or no attention was paid to the health status of the purchased animals. In one such dairy herd, a third of the animals were found to have evidence of infection, posing significant problems for any subsequent control of the disease.

Left displacement of the abomasum

Veterinary practitioners reported an increase in this condition, which primarily affects dairy cows throughout the year. This was due to a reduction in fibre intake during the winter months due to maize silage being too short or reduced straw feeding. It is recommended that at least 30% of maize silage has a chopped length of 7.5 cm. In reality, contractors' harvesting machines are designed to cut at a maximum chop length of 1.7 cm which has the advantage of reducing the bulk of the harvested crop and enabling its more ready compaction in the silo. Unusually, the condition was also reported throughout the summer months due to a reduction in the dry matter content of grass.

Parasitism

Toxocara vitulorum was the unusual cause of death in a farmed bison calf. The small intestine of the calf was distended with approximately 230 15–20 cm worms. *T. vitulorum* can be transmitted to the calf in the milk of the dam, which seemed to be the most likely route of infection in this case. It is an important pathogen in water buffalo and also infects cattle. Most reports came from Asia, Africa and South America.

Respiratory disease

Pneumonia in younger calves was a notable problem during the first half of the year. The overall incidence of husk was unchanged in England and Wales. However, further examination of the Veterinary Investigation Diagnosis Analysis/Farmfile database revealed the Midlands, West and Northern Regions to have had an above average incidence, and Wales and the South East Region a below average incidence. The incidence of infectious bovine rhinotracheitis was slightly above the 10-year average and predictably was a particular problem in many FMD restocked herds. In the latter half of the year, the disease was frequently encountered in conjunction with lungworm infestation.

Small ruminants

The number of South American camelids (camels, llamas, alpacas) kept has increased over the year (there are between 8–10,000 alpacas at present). Camelids make up a significant proportion of submissions and most effort has been concentrated on improving the quality of fibre produced.



There are now nearly 10,000 alpacas in the UK

Vitamin D deficiency

Particularly interesting was a suspected vitamin D deficiency in cria (camelid offspring) born late in the season. Affected cria had a hunched back, an abnormal hindlimb gait and were uneconomical in their movements. Limb deformities were also reported. The condition develops due to a lack of exposure to sunlight, making cria born in late summer particularly susceptible as they have little time to build up reserves of vitamin D before the winter. The condition has been identified in Australia and North America and can be easily prevented by prophylactic injection of vitamins A, D and E, which is widely practised.

Tuberculosis

Tuberculosis was found to be the cause of a hepatic infection in an adult alpaca. The causal organism was identified as *Mycobacterium avium*. Emaciation in some fallow deer in the southwest of England was

due to *M. bovis* infection. The same organism was identified in a red lechwe, a zoo antelope.

Johne's disease

Johne's disease was diagnosed in samples from an adult camelid by a culture of large intestinal content. The causal organism, *M. avium* subspecies *paratuberculosis*, was isolated. Clinical signs reported were weight loss and submandibular oedema. The condition has been often suspected but rarely if ever been diagnosed in UK, although it has been occasionally reported elsewhere. Camelids are thought to be more resistant to experimental infection than cattle, so it would appear unlikely that Johne's disease will become a major disease problem for UK camelids.

Pigs

Post-weaning multisystemic wasting syndrome (PMWS) and porcine dermatitis nephropathy syndrome (PDNS) remain the dominant diseases affecting the pig industry in UK, but an upsurge of pig infertility was reported during the autumn, apparently far exceeding the usual 'seasonal infertility' that affects pigs in the autumn.

The British Pig Executive reported on the high costs of British pig production compared with other European countries. The EU announced new provisions and funding for eradication and control of several pig diseases.

VLA research: PMWS/PDNS

An assay for detection and genotyping of porcine circovirus 2 (PCV2) DNA in archival paraffin tissue blocks was developed and recently presented at an International

Congress on Circovirus Research in France. The results showed that PCV2 viruses similar but distinguishable from viruses found today were infecting British pigs as early as 1986, many years before the marked increase in losses due to PMWS/PDNS in southeast England.

A study of pig kidneys condemned at slaughter was carried out: 85% of the lesions present were consistent with PMWS/PDNS whereas other lesions detected may have been caused by mycotoxins other than ochratoxin. A further serotype (serotype 25) of *Streptococcus suis* was identified in this country, and the Meat and Livestock Commission introduced meatjuice ELISA to detect salmonella-positive units.

Poultry and gamebirds

The gamebird sector expressed concern regarding the lack of availability of dimetrizadole (Emtryl) following the suspension of the marketing authorisation for commercial reasons, pending a decision by the EC. Its unavailability has made the treatment of motile protozoan parasite diseases more difficult, and may result in the re-emergence of blackhead (histomoniasis) in gamebirds.

Dysbacteriosis

Dysbacteriosis in broilers (the current term used for the syndrome characterised by wet litter) was prevalent and difficult to manage. This, together with a reported increase in necrotic enteritis and cholangiohepatitis, was linked by some to a decline in the use of antimicrobial growth promoters. However, it is likely that various other factors, including nutrition, are also involved.

Vertebral osteomyelitis

Vertebral osteomyelitis continues to be recognised in broilers of around five weeks old. Clinically this shows up as lameness and paresis, and lesions are found in T4 from which *Enterococcus cecorum* can be isolated. Septic arthritis is occasionally associated with this organism.

Routine submissions to Regional Laboratories provided a range of diagnoses in domestic poultry and other avian species with no particular pattern being evident. There were frequent submissions from smaller flocks and free range flocks – amongst problems encountered were helminthiasis and red mites, which in some cases were significant.

Wildlife

Wildlife disease has appeared in the news this year through articles on the spread of West Nile virus in wild birds in Europe, phocine distemper virus in seals around North Sea coasts and European bat lyssavirus in Great Britain. The Monitoring Diseases of Wildlife Surveillance Project has, in response to the increasing awareness of this subject, enlarged significantly in scale over recent years. This is in line with declared key aims regarding our wildlife resources made by both the VLA and Defra.

European bat lyssavirus and rabies

European bat lyssavirus type 2 (EBLV2) was isolated on two occasions by the VLA. Once from a Daubenton's bat in Lancashire and once from a fatal human case of rabies in Scotland. The unfortunate individual was a bat worker, who it was believed had been handling and had been bitten by Daubenton's bats. He had not previously been vaccinated against rabies.

European bat lyssaviruses are rabies-related viruses, which very rarely cross from bats into people or other animals, with only three other cases found in humans in the last 25 years. DH jointly with Defra working closely with the Bat Conservation Trust has issued guidance to bat workers on prophylactic vaccination. Bats are a protected species and should not normally be approached or handled. If a person is bitten or scratched by a bat they should immediately wash the wound with soap and water and seek medical advice.

A survey for European bat lyssavirus in British bats has been conducted for a number of years from the submission of dead bats to VLA. The survey is to be enhanced in the spring of 2003.

VLA research: rabies

The VLA was asked to participate in the World Health Organisation sponsored meeting in Geneva to discuss the strategies for post-exposure treatment for rabies in humans. This forms part of the on-going commitment from the group to play a pivotal role in the global community for the control and elimination of rabies in Asia.

The rabies ELISA test, developed through a tripartite agreement between the VLA, a commercial partner and the Agence Francaise de Securite Sanitaire des Aliments was not accepted by the OIE as a prescribed test. Further validation work was performed in order to assess the robustness of the assay in a parallel study with the current serological tests for rabies antibodies. The test dossier was due to be resubmitted in January 2003. Final approval by the OIE will be required before the test can be used for routine screening work as part of the PETS scheme.

West Nile virus

Surveillance for West Nile virus in wild birds was increased and there are three VLA projects involved in this work in which, for the past 18 months, VLA Regional Laboratories have been examining wild birds. At present wild birds found dead can be submitted to a Regional Laboratory for West Nile virus examination.

One project has examined more than 250 wild birds of over 30 species. To date, West Nile virus has not been isolated – smaller numbers of samples have been examined by the West Nile virus PCR test but virus nucleic acid was not detected by this sensitive assay. Evidence of clinical disease was not found from examining the brains of these birds. Although from the results obtained so far we cannot say that the virus is not present in the UK avifauna, examinations do not suggest that widespread deaths in wild birds due to West Nile virus, similar to the losses seen in the USA, are occurring in this country.

Phocine distemper virus

Phocine distemper is a viral infection that primarily affects common seals (*Phoca vitulina*), although grey seals (*Halichoerus grypus*) may also succumb to the disease. The virus, which is related to the canine distemper virus that affects dogs, first appeared in 1988 when several thousand seals in British waters died.

A second epizootic arose in 2002 with common seals found dead on the coasts of several European countries, including England, Scotland, Wales and Ireland. Approximately 3,500 dead seals were counted between August and early December 2002. The outbreak appears to be over in England but the possibility

remains that the virus may have overwintered and may re-emerge in Scotland in 2003. The VLA monitored progress of the epidemic although did not examine seals directly.

Defra (with contributions from the Scottish Executive and the National Assembly for Wales) commissioned the Institute of Zoology to establish systematic survey and reporting of stranded seals nationwide. This included: referring reports of live animals to the welfare organisations; carrying out post-mortem and sampling of dead seals to establish levels of phocine distemper virus infection; estimating the current susceptibility of seals to the disease, and, with the assistance of Sea Mammal Research Unit, predict the impact of an outbreak as it develops; monitor progress of the disease and produce information updates and forecasts of seal mortality to Government and the public; and provide a source of scientific information to assist with media enquiries. The project ends in May 2003 and we expect to receive a report of the results during the summer.

Miscellaneous

Fish

The first UK report of 'sleeping disease of rainbow trout' was produced. The disease is caused by an atypical alphavirus, closely related to the causative agent of salmon pancreas disease.

VLA surveillance: *Mycoplasma*

Surveillance has shown that combined infection with *Mycoplasma ovipneumoniae* and *M. arginini* may be responsible for recent cases of 'coughing syndrome' in sheep flocks. New serological and molecular

detection tests have been developed resulting in improved diagnosis for these fastidious organisms.

VLA research: *Mycoplasma*

Mycoplasma bovis is a primary cause of calf pneumonia, arthritis, mastitis, eye disease and other conditions worldwide and has been estimated to cost the cattle industry millions of pounds annually in mortality and setback losses. Calf pneumonia is a complex syndrome involving bacteria, viruses and mycoplasmas.

In an experimental study, the *Mycoplasma bovis* vaccine was shown to be safe, highly immunogenic in calves and did not cause adverse clinical effects, producing a significant level of protection against a virulent challenge. There was a significant decrease in body weight gain in unvaccinated calves compared to vaccinates and a significant increase in lung lesions and rectal temperatures in unvaccinated calves.

A new PCR test developed by the VLA for diagnosing *M. ovipneumoniae* was successfully used in outbreaks of respiratory disease in *Pasteurella*-vaccinated sheep flocks. The VLA isolated *M. adleri* for the first time in the UK and was found in TSE-negative sheep flocks imported from New Zealand.

VLA research: BVD

An experimental study of acute BVD infection showed that the clinical signs of disease depended on the dose of the inoculum and on simulated immunological stress. These findings indicate that the risk of viral reactivation and subsequent horizontal transfer from cattle that have recovered from acute infection with BVD virus is low. The

majority of the analysed European BVD virus isolates were genetically distinct from those present in the UK, and included a low percentage of type 2 viruses, a strain associated with severe disease outbreaks in some countries.

VLA research: hepatitis E in pigs

A very high seroprevalence (around 95%) was detected in pigs of all ages. Viral RNA was detected by PCR in the faeces of 20% of two groups of pigs from different farms, both experiencing PMWS. Sequencing (two isolates) and phylogenetic studies showed that the UK pig strains were closest to each other and then to the human hepatitis E strain described in 2001.

VLA surveillance: bovine immunodeficiency virus

Bovine immunodeficiency virus infection was found in cattle from the West Country by PCR. A total of 19 animals in one batch were seropositive to the virus, and more significantly three of these were also PCR-positive. Because of the sensitivity of PCR and the possibility of contamination, our preliminary interpretation of these findings was guarded. However, DNA sequencing of the PCR products does indicate that these seropositive, PCR-positive cattle are infected with bovine immunodeficiency or similar virus.

VLA research: bovine immunodeficiency virus

Calves were experimentally infected with a bovine immunodeficiency virus strain from the USA and monitored. Haematology and serology data, and provirus DNA detection by PCR, were collected at weekly intervals. A light-cycler-based PCR test was developed

and used to monitor the viral load over time in blood samples from these infected calves. Preliminary work using PCR testing suggested that bovine immunodeficiency virus proviral DNA sequences may be present in bulk milk samples.



The Veterinary Laboratories Agency is an Executive Agency of Defra

Section C: Prevention and control of animal diseases

The Chief Veterinary Officer has overall responsibility for animal health and welfare in the international trade of animals and animal products. Agriculture Departments in Great Britain continued to play an important role in maintaining Great Britain's defences against the introduction of serious livestock diseases. Following the FMD outbreak in 2001, enhanced measures were introduced to prevent the illegal importation of meat and other animal products, including a pilot scheme for the use of detector dogs at airports.

Chapter C1 International trade: imports

British Agricultural Departments played an important role in safeguarding Great Britain's animal health status. Controls on imported live animals and animal products are in place at ports and airports. All consignments imported from Third Countries are subject to checks at the port of entry. In addition, checks on animals at their destination in Great Britain are carried out on the basis of an assessment of disease risk. Enhanced levels of post-import checks of live animals continued throughout 2002 because of the high levels of imports for restocking of farms during the post-FMD period.

Border Inspection Posts

Animals and animal products from Third Countries which are subject to veterinary checks under EU law must be imported through an approved Border Inspection Post (BIP) where they are subject to a documentary check, an identity check and,

for a specified percentage, a physical check with samples taken for laboratory analysis if appropriate. BIPs must have facilities meeting the requirements of EU law and may operate only after listing following satisfactory inspection by the European Commission.

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**Table C1.1: Border Inspection Posts approved for imports of live animals in Great Britain
December 2002**

Border Inspection Post		Live animals			Remarks
Name	Type	Ungulates (i)	Registered Equidae(ii)	Other animals	
Gatwick	Airport	–	–	✓	All animals other than ungulates (ii)
Glasgow	Airport	–	–	✓	
Heathrow	Airport	✓	✓	✓	
Luton	Airport	✓	✓	–	(i) (ii)
Manchester	Airport			✓	Cats, dogs, rodents, lagomorphs, live fish, reptiles and birds (other than ratites)
Stansted	Airport	✓	✓		(i) (ii)
Prestwick	Airport	✓	✓		(ii)

(i) Stansted and Luton are not Border Inspection Posts for any species of animals specified in the Rabies (Importation of Dogs, Cats and Other Mammals) Order 1974.

(ii) Ungulates include registered Equidae as defined in Council Directive 90/426/EEC (OJ No. L224, 18.8.90, p. 42), as amended.

**Table C1.2: Border Inspection Posts approved for imports of animal products in Great Britain
December 2002**

Border Inspection Post	Approved for
Aberdeen Port	Frozen fishery products only
Belfast Airport	All animal products for human consumption Animal products not intended for human consumption at frozen and ambient temperatures
Belfast Port	Animal products for human consumption under controlled temperature Animal products not intended for human consumption at ambient temperatures
Bristol	Animal products for human consumption which are imported under controlled temperature only Animal products not intended for human consumption which are imported under ambient temperatures only
Dover	All animal products for human consumption All animal products not intended for human consumption
East Midland Airport	All animal products for human consumption
	Animal products not intended for human consumption which are imported at frozen and ambient temperatures only

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**Table C1.2: Border Inspection Posts approved for imports of animal products in Great Britain
December 2002 (continued)**

Falmouth	All animal products for human consumption
Felixstowe	All animal products for human consumption All animal products not intended for human consumption
Gatwick Airport	Packaged animal products for human consumption Packaged animal products not intended for human consumption
Glasgow George V Dock	Processed animal proteins only
Glasgow Airport	All animal products for human consumption Animal products not intended for human consumption which are imported under ambient temperatures and semen and embryos
Glasson	Animal products not intended for human consumption which are imported under ambient temperatures only
Goole	Processed animal proteins only
Grangemouth	Processed animal proteins only
Great Yarmouth	All animal products for human consumption All animal products not intended for human consumption
Grimsby-Immingham	All animal products for human consumption Animal products not intended for human consumption which are imported under ambient temperatures only
Grove Wharf Whartons	Animal products not intended for human consumption which are imported under ambient temperatures only
Harwich	All animal products for human consumption
Heathrow	All animal products for human consumption All animal products not intended for human consumption
Hull	All animal products for human consumption Animal products not intended for human consumption under ambient temperatures only
Invergordon	Processed animal proteins only
Ipswich	All animal products for human consumption All animal products not intended for human consumption
Liverpool	Packaged animal products for human consumption All animal products not intended for human consumption
Manchester Airport	All animal products for human consumption All animal products not intended for human consumption
Milford Haven incorporating Pembroke	All animal products for human consumption All animal products not intended for human consumption

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**Table C1.2: Border Inspection Posts approved for imports of animal products in Great Britain
December 2002 (*continued*)**

Newhaven	All animal products for human consumption All animal products not intended for human consumption
Peterhead	Frozen fishery products for human consumption only
Portsmouth	All animal products for human consumption All animal products not intended for human consumption
Scrabster	Fishery products for human consumption only
Shoreham	Wool only
Southampton	All animal products for human consumption All animal products not intended for human consumption
Stansted Airport	Packaged animal products for human consumption at ambient temperatures only Packaged animal product not for human consumption at ambient temperatures only
Sutton Bridge	Processed animal proteins only
Teesport	Suspended
Teignmouth	Processed animal proteins only
Thamesport	All animal products for human consumption All animal products not intended for human consumption
Tilbury	All animal products for human consumption All animal products not intended for human consumption
Tyne-Northshields	All animal products for human consumption All animal products not intended for human consumption
Wick	Fishery products only

SVS/BIP liaison – East Region pilot scheme

Port Health Authorities are responsible for managing and operating BIPs carrying out checks on food of animal origin, and East Region has taken the lead in reinforcing the liaison between the Central Competent Authority (Defra) and the Port Health Authorities. Their aim is to ensure that the facilities and checks carried out are in line

with British and EU law and to ensure the protection of animal and public health.

Lead Veterinary Officers and Port Senior Animal Health Officers were instructed to maintain better records of their visits to Port Health Authorities and BIP facilities, and to review as well as monitor statutory returns from the BIP. In parallel with these changes, the evaluation process was subjected to the European Federation of Quality Management review.

Regional Lead Veterinary Officers drafted a comprehensive checklist covering the construction requirements of BIP facilities and the veterinary checks procedures. Training for all lead Veterinary Officers and Senior Animal Health Officers has been arranged, to provide additional guidance for all veterinary and technical staff to enable the SVS/BIP initiative to achieve both its requirements and its purpose.

A new BIP Manual which provides a detailed account of the required facilities and procedures at BIPs was issued in June 2002 to take account of changes made by the new Products of Animal Origin (Third Country Imports) Regulations. This manual is supplemented by additional instructions and guidance for Official Veterinary Surgeons.

Imports of live animals and germplasm

Under the Interim Movement Arrangements, imported FMD-susceptible animals were subject to movement licensing.

Intra-community trade

Imports of FMD-susceptible animals resumed during 2002 following restrictions put in place during the 2001 FMD outbreak. The majority of animals were imported from other EU Member States for the restocking of farms affected by FMD.

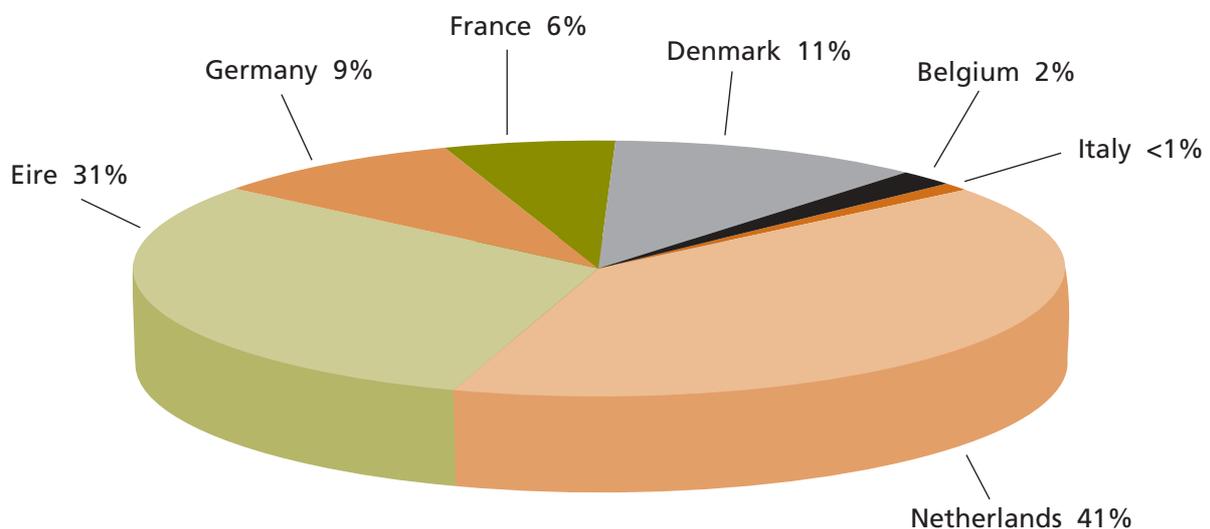
Cattle

Over 16,000 cattle entered Great Britain from other EU Member States. In addition, 3,271 cattle were imported from Northern Ireland, approximately 2,300 for breeding purposes.

Sheep and goats

Some 8,500 sheep and goats entered Great Britain from other EU Member States. Additionally 65,300 sheep and goats were imported from Northern Ireland, approximately 63,100 of which were for slaughter.

Figure C1.1: Import of cattle into Great Britain from other EC Member States during 2002



Pigs

Over 5,100 pigs entered Great Britain from other EU member States mainly from the Republic of Ireland, France, Denmark and Germany. Some 32,100 pigs were imported for slaughter from Northern Ireland.

Equidae

Over a third of the messages received via the EU electronic system for notification of animal movements (ANIMO) for horses imported into or via Great Britain from Member States during 2002 were from the Republic of Ireland, around 2,000 of them in transit.

Figure C1.2: Import of sheep and goats into Great Britain from other EC Member States during 2002

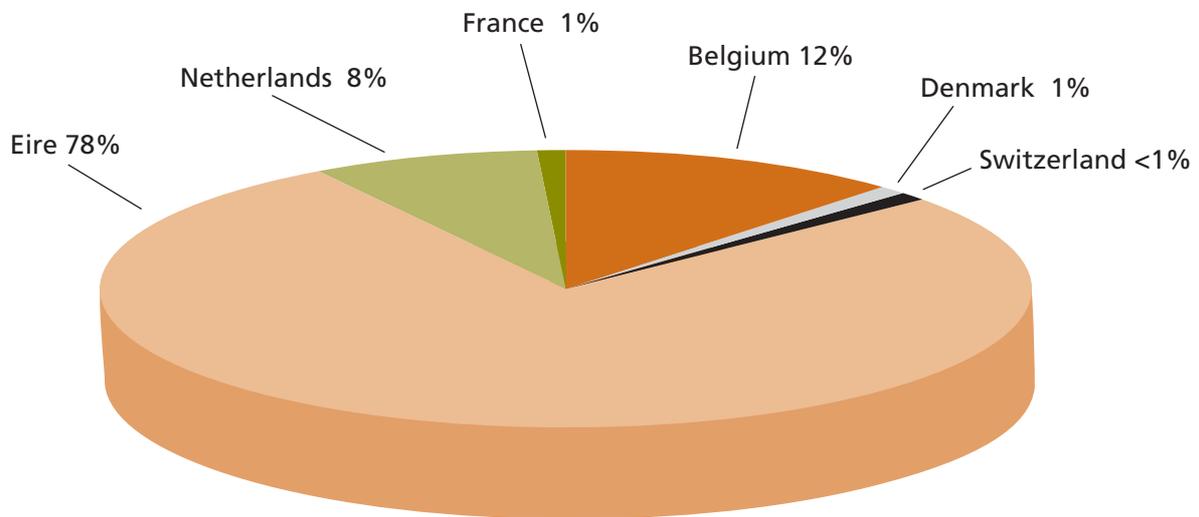
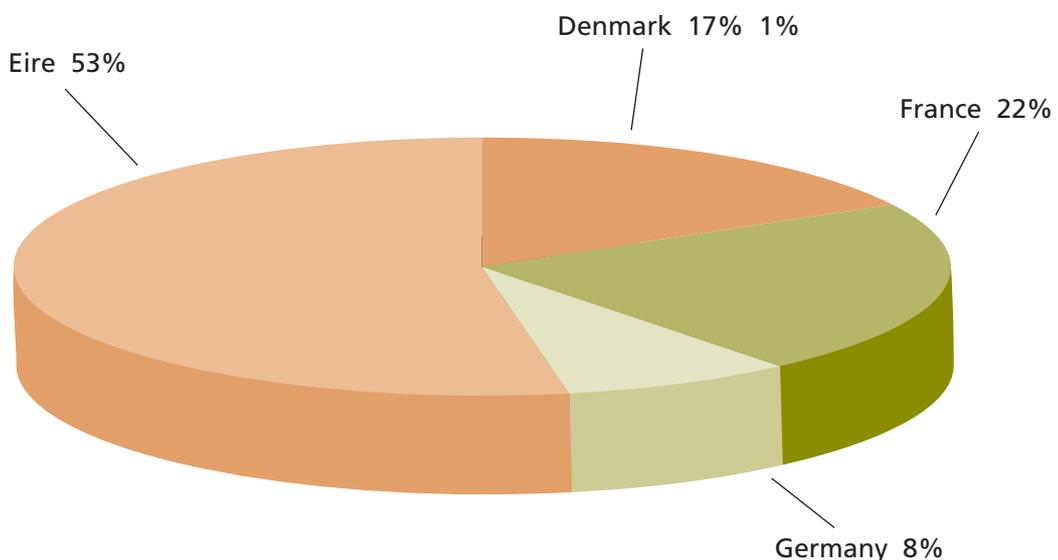


Figure C1.3: Import of pigs into Great Britain from other EC Member States during 2002



Poultry

Over 76 million hatching eggs were imported during 2002 from EU Member States, 85% of which came from France. In the same period, almost 10 million birds, mainly day old chicks, were imported, 73% from France.

Semen, ova and embryos

The Netherlands (172,788 straws) and Italy (151,448 straws) were responsible for more than half of all imported bovine semen from Member States in 2002. Over 35,400 straws of bovine semen were imported from

Figure C1.4: Import of poultry into Great Britain from other EC Member States during 2002

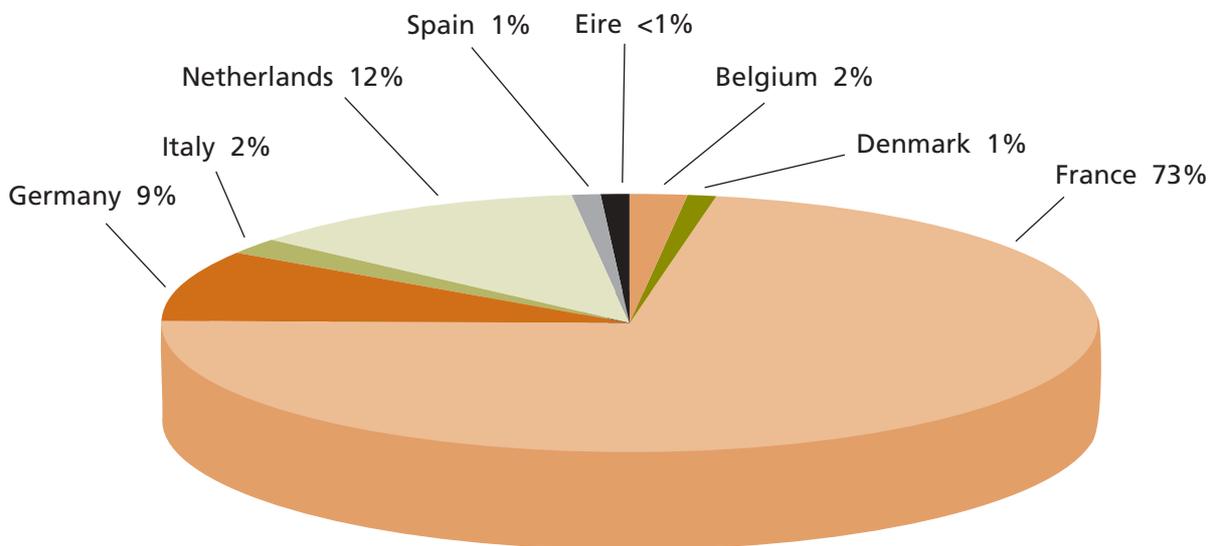
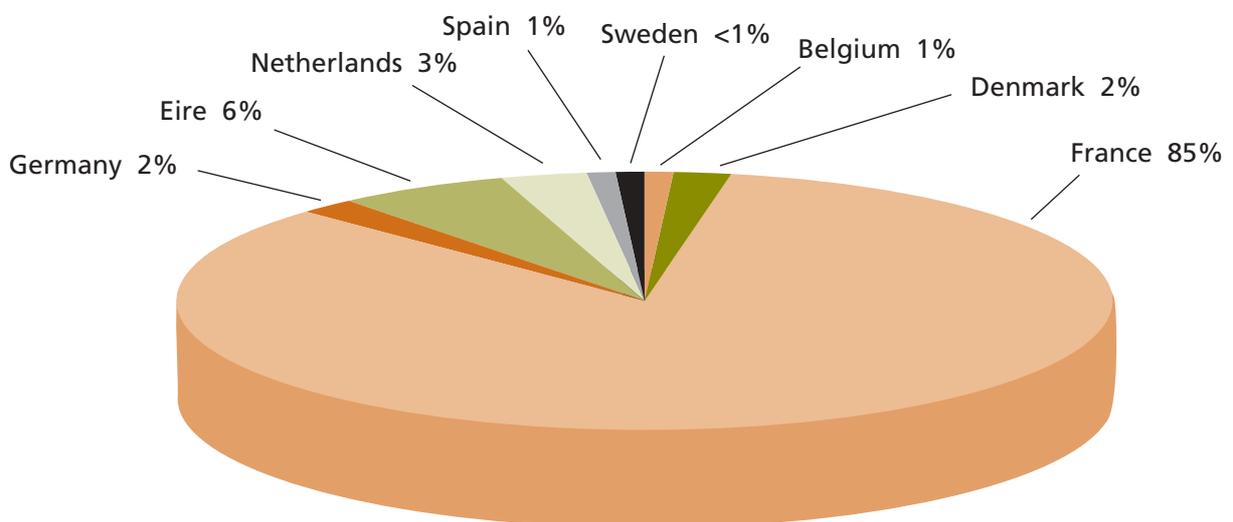


Figure C1.5: Import of hatching eggs into Great Britain from other EC Member States during 2002



Northern Ireland in 2002. The Netherlands (1,223) and Sweden (1,509) were the main EU countries for imports of bovine embryos.

Over 12,500 doses of porcine semen were imported from Member States in 2002, the Republic of Ireland and France being the main exporters with 6,370 and 6,042 respectively. A total of 95 doses of ovine semen were imported, 52 from France and 43 from the Netherlands, and 260 doses of caprine semen were imported from France.

Zoo animals

Zoo animals imported from other EU Member States included hippopotamus, giraffe, bush pig, gazelle, mouflon sheep, camels, Congo buffalo, kudu and peccary.

Third Countries

Livestock and other ruminants

A number of consignments of alpacas were imported from Chile, Switzerland, Australia (Tasmania) and Canada, some of which had been in quarantine since the start of the 2001 FMD outbreak. No cattle, pigs, sheep or goats were imported from Third Countries during 2002.

Horses

The majority of horses imported from Third Countries originated from the USA, United Arab Emirates and from Argentina.

Table C1.3: Equidae imported into Great Britain from Third Countries during 2002

Country of origin	Number of horses
Argentina	309
Australia	66
Bahrain	4
Bermuda	2
Brazil	2
Canada	70
Chile	64
Croatia	1
Czech Republic	18
Hong Kong	6
Hungary	18
Iceland	11
Japan	15
Latvia	7
New Zealand	95

Table C1.3: Equidae imported into Great Britain from Third Countries during 2002 (continued)

Norway	38
Poland	33
Qatar	7
Russia	13
Saudi Arabia	4
Singapore	6
Slovakia	1
South Africa	21
South Korea	8
Switzerland	76
Turkey	3
United Arab Emirates	325
USA	649
Yugoslavia	4
Total	1,876

Poultry

British poultry imports are mainly commercial generation layers or broilers. During 2002, fluctuations in market prices and some oversupply problems in Europe led to greater movement than usual both inwards and outwards from Great Britain. Imports mainly came from the USA and Brazil.

Captive birds

Following the introduction of EU Commission Decision 2000/666/EC in November 2001 covering the import of captive birds from Third Countries, there was a steady increase in the number of premises approved as import quarantine premises. By the end of 2002 there were 24 approved quarantine premises in Great Britain. All imports were tested for Newcastle disease and avian influenza. No cases were recorded in Great

Britain in 2002, although paramyxovirus 2 (PMV2) was isolated on one occasion.

A series of leaflets were produced and sent to all current importers and other interested parties including the bird journals, and were also distributed at bird shows, to disseminate public information about the import of captive birds. Copies of these leaflets are available from the Defra Helpline (Telephone: 08459 335577).

Fish

Over 62 million live fish and shellfish were imported from over 50 countries. All consignments are delivered to BIPs for veterinary checks before they are released into the EC. Fish which are in transit to other EU Member States must also satisfy British health requirements.

Bees

The importation of queen bees from certain Third Countries is permitted in Great Britain under licence. During 2002, some 2,100 queen bees were imported from Australia, Hawaii and New Zealand (South Island). In November 2002, Great Britain temporarily suspended imports from Australia in order to assess the risk posed by the importation of queens as a result of the discovery of the small hive beetle, *Aethina tumida*, in Australia.



Queen bee imports from Australia were temporarily suspended

Imports of animal products

The Products of Animal Origin (Third Country Imports) (England) Regulations 2002 (SI 2002/1227) came into force in May 2002; similar regulations were also introduced in Scotland, Wales and Northern Ireland. The new Regulations replace those parts of the Products of Animal Origin (Import and Export) Regulations 1996 which dealt with imports

from non-EU countries. They implement the provisions of Council Directive 97/78/EC which sets out the requirements and procedures for veterinary checks on products of animal origin imported into the EC.

The Regulations were amended to include new EU rules on products imported by individuals in their luggage, which come into effect on 1 January 2003. Under these rules, personal imports of meat, meat products, milk and milk products from outside the EU and specified European countries are effectively prohibited. The only exceptions to this will be powdered baby milk, infant food and special foods required for medical reasons, provided they do not need to be refrigerated and are proprietary branded products in unbroken packaging.

Illegal imports

Much progress was made during 2002 to tackle illegal imports. Although the disease-risk posed by illegal imports can never be eliminated, Defra accepts there is still more to do. The Government produced an action plan to reduce the risk of disease entering the country and damaging agriculture, horticulture and wildlife. Stakeholders asked for action against illegal imports to be proportionate and evidence-based, so much of the work during the year was aimed at gathering information to get a better understanding of the problem.

Achievements during 2002 included:

- the commissioning of a risk assessment to estimate the quantity of illegal imports entering Great Britain; the probability of these imports being infected with an exotic animal disease, and the likelihood that this illegally imported contaminated meat will infect livestock – the assessment

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report is due early in 2003, and the results will underpin future work on deterrence and enforcement;

- funding additional checks for illegal imports at selected ports and airports in the 2002/03 financial year;
- the launch in September 2002 of a pilot using detector dogs to trace products of animal origin in baggage and cargo;
- the launch of the 'Don't Bring Back More Than You Bargained For' publicity campaign in July 2002.

The Prime Minister commissioned the Cabinet Office to undertake a review of the organisation of the Government's controls on imports of animals, fish, plants and their products. The review was completed in

November 2002 and its recommendations accepted. In 2003, Customs and Excise will take over all activity against the smuggling of meat, animal products, fish and plant matter, and there will also be improved coordination between control agencies.

The Government welcomed the strengthening of the EU rules on personal imports of meat, milk and their products from 1 January 2003. A revised Illegal Imports Action Plan will be issued in March 2003.

International disease surveillance

During 2002, all European Union countries reported diseases of significance to the Animal Disease Notification System,

Table C1.4: Outbreaks of major diseases of animals in Europe during 2002

Country		FMD	SVD	Rinderpest	CBPP	BT	CSF	CSF WB	ASF	ND	IHN	BSE
Austria	A										1	
	B										28 Feb	
Belgium	A							1				35
	B							8 Nov				6 Dec
Bulgaria	A						3					
	B						11 Apr					
Czech republic	A											2
	B											7 Oct
Denmark	A									135		3
	B									28 Aug		20 Nov
France	A						1				6	226
	B						29 Apr				11 Jun	2 Dec
Germany	A						11				10	99
	B						19 Sep				30 Oct	10 Dec
Ireland	A											312
	B											5 Dec

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Table C1.4: Outbreaks of major diseases of animals in Europe during 2002 (*continued*)

Country		FMD	SVD	Rinderpest	CBPP	BT	CSF	CSF WB	ASF	ND	IHN	BSE
	B											5 Dec
Italy	A		171			11			11		9	3
	B		6 Dec			28 Feb			2 Dec		23 Jun	25 Jan
Luxemburg	A						11					1
	B						12 Aug					9 Aug
Netherlands	A											24
	B											6 Dec
Norway	A											
	B											
Portugal	A											63
	B											16 Sep
Romania	A						1					
	B						9 Apr					
Slovakia	A						6					2
	B						7 Oct					26 Aug
Slovenia	A											1
	B											18 Jan
Spain	A						16					118
	B						6 May					25 Nov
Switzerland	A										1	22
	B										24 May	14 Nov
Great Britain	A											1,051
	B											8 Nov
Total	A		171			11	49	1	11	135	27	1,962

Date: 1 Jan 02 to 13 Dec 02. A, Number of outbreaks; B, last date of confirmation; FMD, foot-and-mouth disease; SVD, swine vesicular disease; CBPP, contagious bovine pleuropneumonia; BT, bluetongue; CSF, classical swine fever; CSF WB, classical swine fever wild boar; ASF, African swine fever; ND, Newcastle disease; IHN, infectious haematopoietic necrosis; BSE, bovine spongiform encephalopathy. There were no recorded outbreaks of the following diseases during 2002: avian influenza, vesicular stomatitis, peste des petits ruminants, lumpy skin disease, African horse sickness, Rift Valley fever or porcine enterovirus encephalomyelitis.

Chapter C2: International trade: exports

British Agricultural Departments are responsible for ensuring that intra-Community trade in live animals, their genetic material and animal products is undertaken in accordance with EU rules. In the case of exports to Third Countries, Defra negotiates and drafts the necessary health certification to meet the conditions for import into the country of destination.

In May 2002, the Export Certification User Group was established to co-ordinate efforts in rebuilding the export markets lost to the UK as a result of the FMD outbreak. The Group, chaired by Defra and comprising Trade Partners UK (the Government body with lead responsibility for providing support for UK exporters) and key industry representatives, helps to identify priority markets for livestock, their meat and germplasm on which Departmental resources can be focused. In September 2002, a similar group was established to focus in exports of milk and dairy products.

Defra was active in persuading overseas authorities to accept British exports again by corresponding with other veterinary authorities, including through British Embassies and High Commissions, and also arranged inward missions of Ministers and officials. At the height of the FMD outbreak, 76 Third Countries had imposed trade restrictions. Some of these countries required the completion of very detailed questionnaires on the outbreak and our control measures before they would agree to lift the bans. We also hosted visits of veterinary experts from Third Countries wishing to make their own assessment of British FMD controls.

From 1 October 2002, Great Britain had been free from FMD for 12 months. This led to bans being lifted by countries that required the

country of despatch to be disease-free for at least 12 months. By the end of December 2002, only three major markets remained closed by FMD restrictions, and negotiations with these countries were well advanced.

Live animals

Diseases

FMD

Great Britain was recognised as FMD-free, without vaccination, by the Office International des Epizooties on 22 January 2002. The last case of FMD was confirmed on 30 September 2001. Some of the EU restrictions on exports of live pigs were lifted at the beginning of December 2001, but exports did not restart until the New Year. All remaining FMD-related restrictions were lifted by Commission Decision 2002/253/EC which was transposed into national legislation on 6 March 2002.

Contagious equine metritis

In October 2002, contagious equine metritis was confirmed in a stallion tested on entry into an equine semen collection centre. Defra suspended the issuing of export health certificates for semen collected from donor animals on the centre until the status of the centre was restored following testing of at-risk animals. Export certification of horses to

Table C2.1: Export of animals from Great Britain to EC Member States 1998–2002

	1998	1999	2000	2001	2002
Cattle	0	0	0	0	0
Sheep	703,183	1,159,989	607,561	84,220	138,684
Goats	287	441	238	12	34
Pigs	182,476	103,221	85,819	12,201	22,083
Horses ^a	9,250	7,952	8,313	13,433	9,800

^a Figures for horses do not include exports to the Republic of Ireland or registered horses exported to France, for which export health certificates are not required and are not recorded on ANIMO. However, during 2001 and the early part of 2002, horses to the Republic of Ireland and France had to be accompanied by health certificates as a result of the 2001 FMD outbreak.

other EU Member States and most third countries was not affected by the occurrence of the contagious equine metritis outbreak.

Intra-community trade

The number of animals exported from Great Britain to other Member States during the years 1998 to 2002 are shown in Table C2.1. As expected, the 2001 figures show a marked decrease in the number of FMD-susceptible animals exported. The figures are based on information held on ANIMO.

Cattle and bovine germplasm

The EU ban on exports of cattle from Great Britain due to BSE concerns, which came into force on 27 March 1996, remained in place. In July 2002, the EU Standing Committee on the Food Chain and Animal Health, agreed to amend EU legislation to lift the ban on exporting bovine embryos from Great Britain. This was agreed in the light of the latest scientific advice that bovine embryos can be safely traded in accordance with normal international trade rules. Bovine semen continued to be traded without restriction in accordance with EU rules.

Sheep and goats

Following the lifting of FMD-related restrictions on trade in sheep and goats from Great Britain, the Animals and Animal Products (Import and Export) (England and Wales) Regulations 2000 were revised to introduce new controls on the operation of export assembly centres. In particular, a requirement was introduced for assembly centre operators to have an operational agreement with their local Divisional Veterinary Manager setting out operational and biosecurity measures. Sheep exports resumed in July 2002. The main markets were sheep for slaughter to France, Italy and Germany.

Pigs

Exports of live pigs resumed in early 2002. Most pig exports were for breeding. The main destinations within the EU were the Netherlands, Belgium and Germany.

Figure C2.1: Export of sheep and goats from Great Britain to EC Member States during 2002

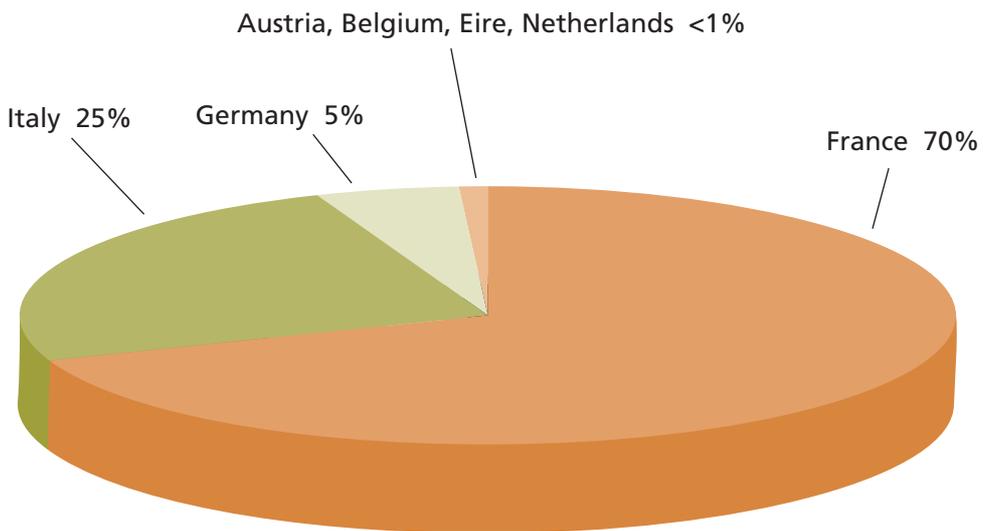
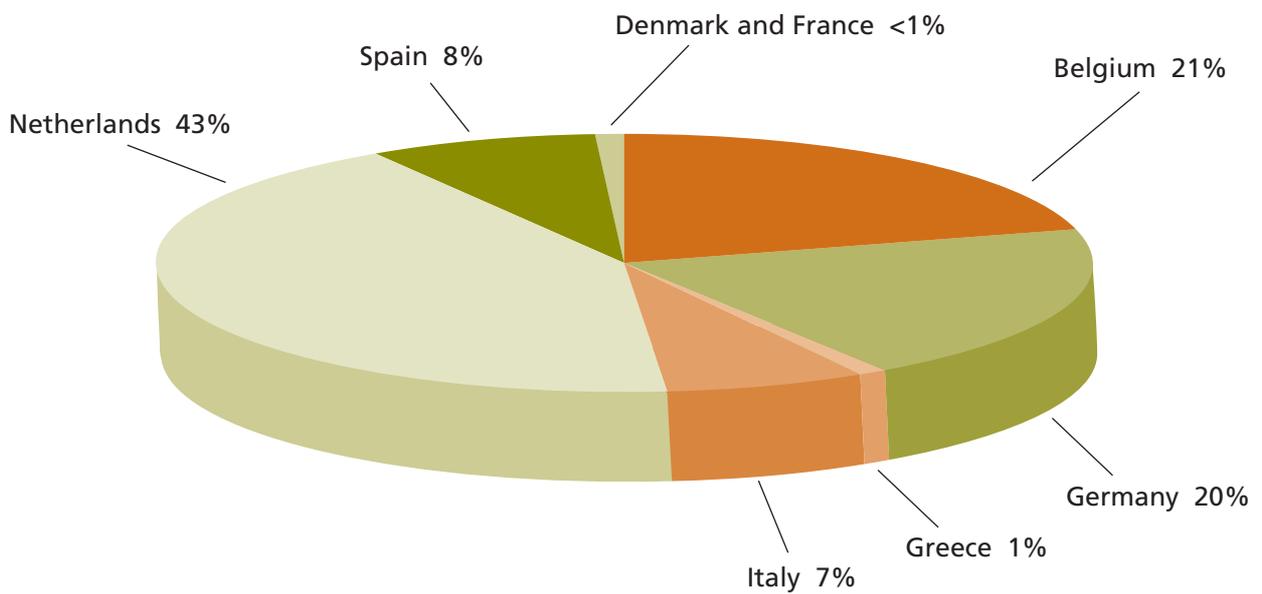


Figure C2.2: Export of pigs from Great Britain to EC Member States during 2002





Most pig exports were for breeding purposes

Horses and equine germplasm

Arrangements for the movement of horses between Great Britain, Republic of Ireland and France under the Tripartite Agreement recommenced in April 2002. This followed the Agreement's suspension during the 2001 FMD outbreak. The main markets for equine semen were France, Germany and Belgium.

Poultry

The export of poultry and hatching eggs to other Member States continued at a high level during 2002. The main export markets within the EU for hatching eggs were France, Austria, Netherlands and Ireland. The main export markets for poultry were the Netherlands, France and Italy.

Figure C2.3: Export of hatching eggs from Great Britain to EC Member States during 2002

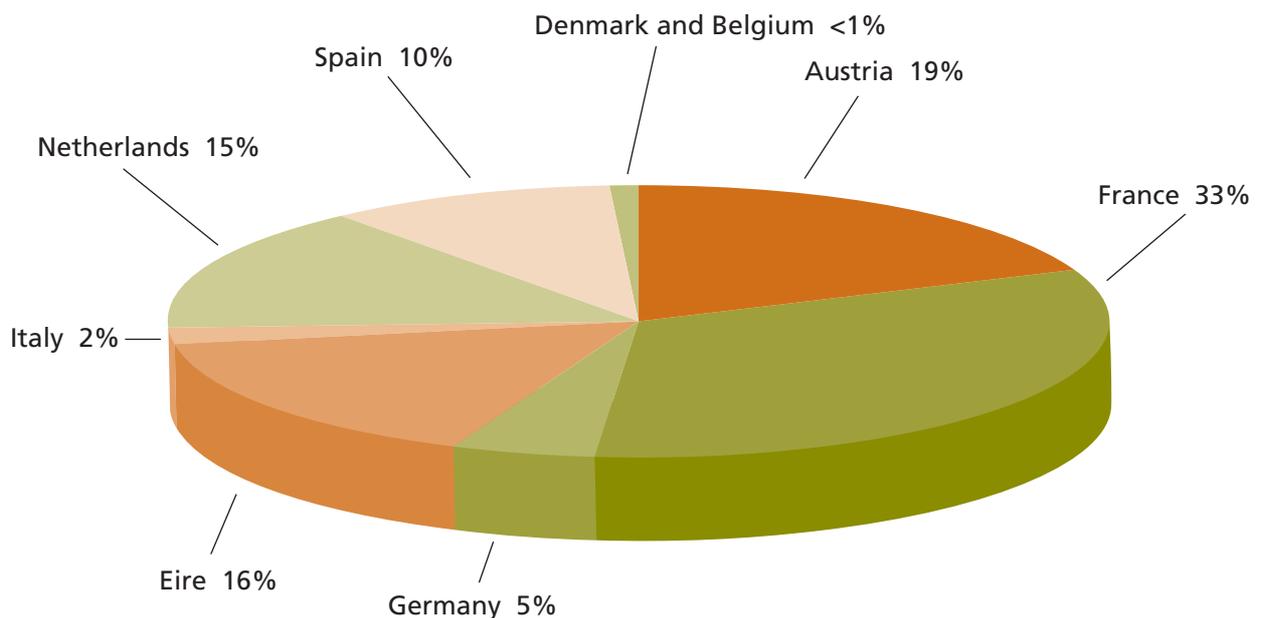
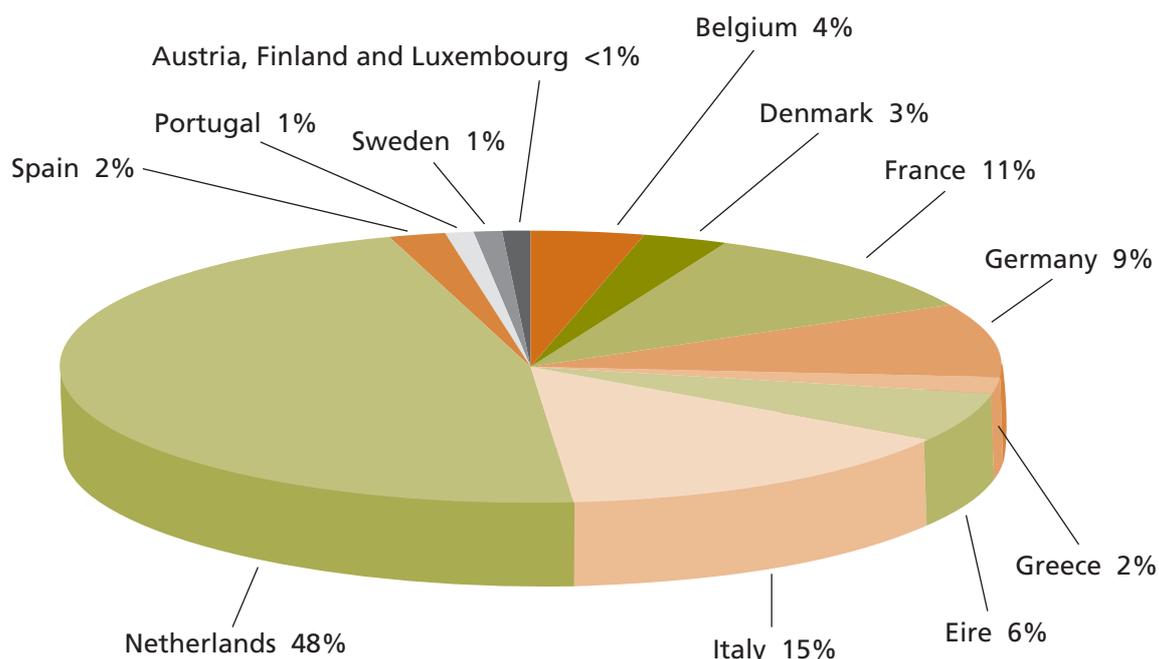


Figure C2.4: Export of poultry from Great Britain to EC Member States during 2002



Exports to third countries

Pigs

Following the successful negotiation of export health certification with some Third Countries, almost 1,000 breeding pigs were exported in 2002, the main markets being the Philippines and Poland.

Horses

Certificates were issued for a number of equestrian teams based in Great Britain to enable them to participate in the Asian Games in Seoul, South Korea. Additional FMD certification remained in place for horses exported to the USA during 2002.

Poultry

There was a steady growth in export of hatching eggs and day-old chicks destined as breeding stock for commercial broiler production, commercial egg layers and turkey meat production. Great Britain is a net exporter of breeding generation poultry, and a net importer of commercial generation poultry. The main export markets for poultry and hatching eggs were Brazil, Croatia, the Czech Republic and Hungary.

Council Directive 92/65/EEC

The UK played an active role in EU Working Groups to discuss revisions to Directive 92/65/EEC. The Directive, also known as the 'Balai Directive', sets out the animal health conditions relating to the movement of animals not specifically covered by the other trade Directives.

Commission Decision 1282/2002 was subsequently agreed which must be implemented by March 2003. One of the main changes relates to the approval of zoos and centres which trade in exotic species.

Animal products

FMD

Exports of products of FMD-susceptible animals increased as FMD came under greater control during 2001. In February 2002, the European Commission lifted all FMD-related restrictions for intra-community trade in animal products of biungulate origin and exports of those products to Third Countries. Trade with all Member States resumed on the basis of normal EU rules, which for most products do not require export certificates. Defra was then able to seek reversal of FMD-related bans imposed by a number of countries outside the EU.

BSE

The BSE-related restrictions on the export of beef from animals born, reared and slaughtered under the DBES were relaxed in August 2002. The main change was to get rid of the so-called 'dedication rule'. As a result, establishments handling DBES bovine goods no longer had to be dedicated to handling only eligible bovine goods, as long as there was clear and effective separation in time (at the slaughterhouse) and/or space (at downstream establishments) from export of ineligible bovine goods. One slaughterhouse, with a co-located cutting plant, was approved under the revised scheme rules. France lifted its ban on bovine goods prepared under the DBES in October 2002.

Chapter C3: International trade: safeguard measures

Where necessary as a result of disease outbreaks in other EU Member States or Third Countries which were liable to present a risk to animal or public health, restrictions were put in place on the importation of live animals, their germplasm and, as appropriate, their products.

For animals and genetic material these restrictions were applied by Declarations made under Regulation 27 of the Animals and Animal Products (Import and Export) (England and Wales) Regulations 2000. For animal products the equivalent legal base is Regulation 35 of the Products of Animal Origin (Import and Export Regulations) 1996 and subsequently Regulation 54 of the Products of Animal Origin (Third Country Imports) (England) Regulations 2002. Similar Declarations were issued by Northern Ireland, Wales and Scotland under their equivalent legislation.

There were 20 Declarations issued for animals and genetic material and 21 for animal products to prohibit imports from specified regions, areas or territories.

VLA surveillance: international trade tests

The volume of post-import laboratory tests rose during the year as a result of enhanced levels of checks on imported livestock. Single cattle in two imported consignments gave positive reactions to brucellosis blood tests and were slaughtered because of the potential risk to the national herd. Fortunately, disease was not confirmed on subsequent bacteriological investigation.

VLA Bury St Edmunds isolated *Taylorella equigenitalis*, the causative agent of contagious equine metritis, from samples submitted from a Warmblood (Warmblut) stallion prior to entry into an approved semen collection centre. Subsequent testing was carried out on at-risk stallions and mares to re-establish the export status of the premises.

Chapter C4: Livestock protection: animal breeding

The purpose of animal breeding controls is to protect animal welfare and to reduce the risk of breeding practices being involved in the introduction or spread of diseases in livestock populations.

General

Artificial insemination (AI) in cattle and pigs, and embryo transfer in cattle, is carried out under statutory controls. There are no specific national controls on either activity in sheep or goats, but collection centres must be approved by the appropriate Minister if semen or embryos are to be eligible for intra-Community trade. Most activities involving AI in cattle or pigs may take place only under the authority of licences granted by the appropriate Minister.

Table C4.1: Number of new licences granted in Great Britain during 2002 and total existing licences									
	Licences issued in 2002			Total existing licences at 31 Dec 2002			Total		
	England	Scotland	Wales	England	Scotland	Wales		Great Britain	
EU bovine semen processing centres	1	0	0	4	0	1	5		
Domestic bovine semen processing centres	0	0	0	1	0	0	1		
Bovine semen main stores	1	0	0	6	2	1	9		
Bovine semen supply centres	5	1	0	49	8	15	72		
Bovine semen shops	2	0	0	15	0	4	19		
Bovine semen farm storage units	372	29	20	6,527	1,091	974	8,592		
Bovine farm storage servicing licences	2	0	1	15	3	5	23		
On-Farm processing licences for bovine semen	1	0	2	2	5	2	9		
EU porcine semen collection centres	2	0	0	10	1	0	11		
Domestic porcine semen collection centres	2	0	0	5	0	0	5		
EU bovine embryo collection teams	0	0	0	15	3	0	18		
EU bovine embryo transfer teams	0	0	0	15	1	0	16		
EU bovine embryo production teams	0	0	0	3	0	0	3		

Table C4.1: Number of new licences granted in Great Britain during 2002 and total existing licences (continued)										
	Licences issued in 2002				Total existing licences at 31 Dec 2002				Total	
	England	Scotland	Wales	Great Britain	England	Scotland	Wales	Great Britain	England	Scotland
Domestic bovine embryo collection team	1	0	1	2	5	0	2	7		
Domestic bovine embryo transfer teams	2	1	0	3	7	1	6	14		
Domestic bovine embryo production teams	0	0	0	0	0	0	0	0		
EU embryo stores	0	0	0	0	12	0	0	12		
Domestic embryo stores – on-farm and non-farm	9	1	0	10	42	10	10	62		
EU ovine/caprine embryo collection teams	0	0	0	0	1	0	0	1		
EU ovine/caprine semen collection teams	0	0	0	0	1	0	0	1		
EU bulls approved	407	0	51	458						
EU bulls rejected	2	0	0	2	N/A	N/A	N/A	N/A		
Domestic bulls (on-centre collection) approved	17	0	0	17	N/A	N/A	N/A	N/A		
Domestic bulls (on-centre collection) rejected	0	0	0	0	N/A	N/A	N/A	N/A		
Domestic bulls (on-farm collection) approved	71	90	6	167	N/A	N/A	N/A	N/A		
Domestic bulls (on-farm collection) rejected	0	0	0	0	N/A	N/A	N/A	N/A		
EU boars approved	762	0	0	762	N/A	N/A	N/A	N/A		
EU boars rejected	23	0	0	23	N/A	N/A	N/A	N/A		
Domestic boars approved	142	0	0	142	N/A	N/A	N/A	N/A		
Domestic boars rejected	2	0	0	2	N/A	N/A	N/A	N/A		

Domestic indicates semen or embryos destined for domestic distribution only.

Bovine AI

The collection, processing, storage and movement of bovine semen intended for intra-Community trade is governed by Council Directive 88/407/EEC. The European Commission presented proposals to the Council of Ministers and European Parliament to revise the Directive in September 2002 and these are currently under consideration.

Domestic collection, processing, storage and movement of bovine semen is governed by the Artificial Insemination of Cattle (Animal Health) (England & Wales) Regulations 1985, as amended (and corresponding legislation in Scotland). The need for revision of these regulations is recognised and this will be pursued once the revised Council Directive 88/407/EEC is further advanced.

Bulls from which semen will be collected for AI are tested for infection with *Mycobacterium bovis*, *Brucella abortus*, bovine leukaemia virus (the cause of enzootic bovine leukosis), bovine herpes virus-1 (the cause of infectious bovine rhinotracheitis/infectious pustular vulvovaginitis), bovine virus diarrhoea virus, *Trichomonas foetus* and *Campylobacter fetus*. Bulls at AI centres are required to be tested annually for infection with *M. bovis*, *B. abortus*, bovine leukaemia virus and bovine herpes virus-1.

Training in AI

The insemination of cattle by suitably qualified farmers or their employees using semen from licensed farm storage units is termed 'DIY AI'. An increased demand for DIY AI led to a review of AI training and subsequently to a change in the AI of Cattle Regulations 1985 in April 2002 to allow Defra, the Scottish Executive Environment and Rural Affairs Department (SEERAD) or

NAWAD (as appropriate) to approve new and revised courses. Until this change, DIY AI courses could only be approved by the Agricultural Training Board, which now no longer exists. The effect of the newly revised AI of Cattle Regulations 1985 is that DIY AI will be permitted if the inseminator is the holder (or employee of the holder) of a Farm Storage Licence, and that person has completed a course approved by either the Agricultural Training Board or Defra, SEERAD or NAWAD.

The objectives in regulating this training are:

- to protect the welfare of animals used for training purposes;
- to protect the welfare of animals inseminated by trainees after the end of a course;
- to ensure trainees are aware of the potential risks of the spread of diseases associated with AI;
- to ensure trainees are aware of the legal requirements relating to artificial insemination.

Only courses where practical training is carried out on-farm will be approved.

Porcine AI

The animal health requirements for the intra-Community trade of porcine semen is governed by Council Directive 90/429/EEC. This Directive was subsequently modified by Commission Decisions 1999/608/EC and 2000/39/EC. The Artificial Insemination of Pigs (EEC) Regulations 1992 implement these requirements in relation to exports to Member States and the approval of semen collection centres that engage in intra-Community trade in porcine semen.

Domestic animal health requirements relating to porcine AI are laid down in the Artificial Insemination of Pigs (England and Wales) Regulations 1964, and the Artificial Insemination of Pigs (Scotland) Regulations 1964.

Boars whose semen is destined for domestic use only are tested for *Brucella suis*, porcine herpes virus-1 (the cause of Aujeszky's disease) and *M. bovis* before admission to a semen collection centre. The same tests are carried on boars whose semen is destined for intra-Community trade, with the addition of a test to demonstrate the country's continued freedom from classical swine fever. All pigs on domestic centres, and those that have been on an EU Centre for over 12 months, are subject to an annual inspection and are tested for infection with *B. suis* and porcine herpes virus-1.

Following the recommendation of the Office International des Epizooties, the European Commission standardised the buffered Brucella antigen test (known as the 'RBT') for the identification of *B. suis* infection, with effect from 1 January 2001. While highly sensitive, the specificity of the RBT has led to problems with false positives, believed to be due to infection with *Yersinia enterocolitica*. A competitive enzyme linked immunosorbant assay (cELISA) has been developed by the VLA to address this problem.

Bovine embryo transfer

The collection, production and transfer of bovine embryos are controlled by the Bovine Embryo (Collection, Production and Transfer) Regulations 1995. Any person carrying out embryo transfer in a bovine must be either a veterinary surgeon or a member of an approved team headed by a veterinary surgeon. The legislation is designed to protect the health and welfare of both donor and recipient animals.

Section D: Animal welfare on farm, during transport, at market and at slaughter

Chapter D1: Animal welfare

There was a welcome return to something approaching normality this year, following the FMD outbreak in 2001. A major task was to start work on a new Animal Welfare Bill, and this proceeded throughout the year. Work on several other important areas, for example slaughter, cattle and pig codes continued.

The Veterinary Animal Welfare Division, together with Animal Welfare Division, continued to have an active input into animal welfare issues at both EU and Council of Europe level. A notable success was the agreement of the Convention for the Protection of Animals during International Transport in Strasbourg.

Welfare on farm

All farmed livestock on agricultural land is protected in Great Britain by law, which makes it an offence to cause or allow unnecessary pain or distress. The Council of Europe also covers animal welfare through five conventions. One of the conventions, the Protection of Animals Kept for Farming Purposes, sets out the conditions needed to avoid any unnecessary suffering or injury and takes account of physiological and behavioural needs.

SVS (State Veterinary Service)

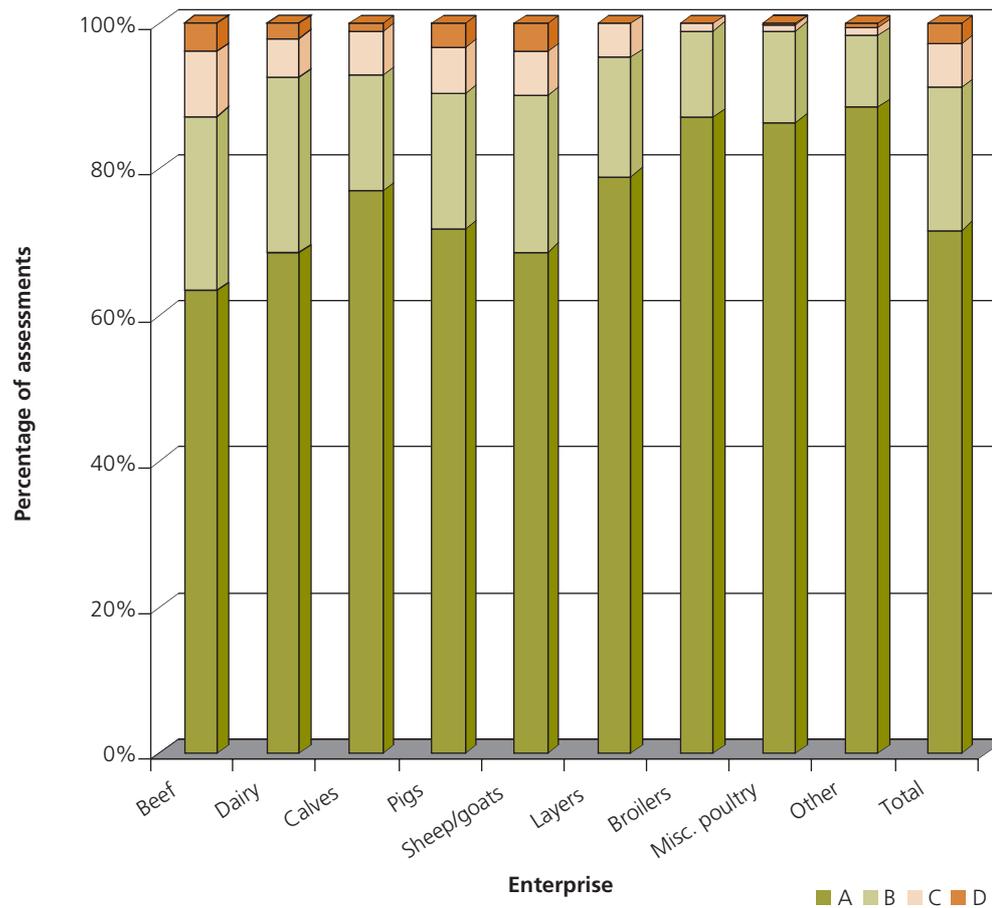
The SVS carries out welfare inspections on farms, to check that legislation and the welfare codes are being followed. All

complaints and allegations of poor welfare on specific farms are treated as a matter of urgency. Computer systems used to record farm and market visits were updated during the year and, at the end of 2002, Divisional Offices were given access to a web-based data warehouse system that afforded them greater control over the welfare visit information stored on Vetnet, the SVS database. Defra also co-operate closely with other organisations such as local authorities and the RSPCA.

Inspection results by enterprise

Figure D1.1 gives the inspection results by enterprise and shows that non-compliance problems were most commonly seen in extensive systems such as beef, sheep and dairy.

Figure D1.1: Welfare inspections on farms in Great Britain January–December 2002: enterprise

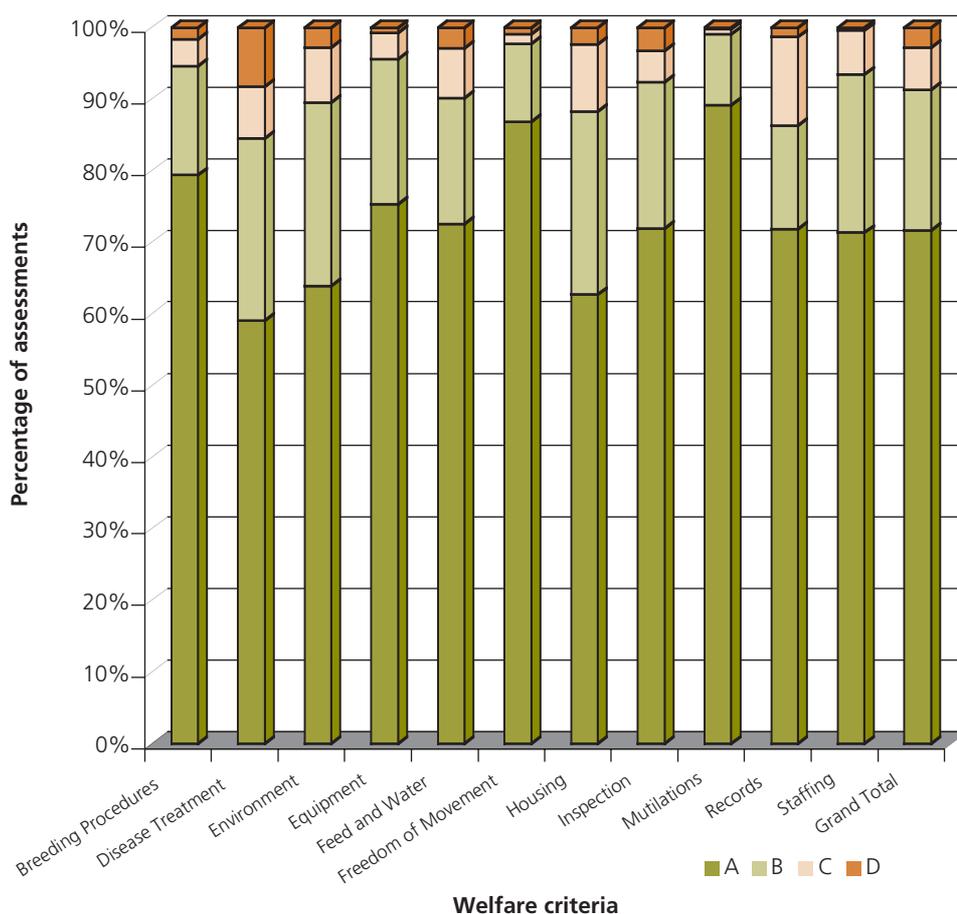


Overall results of SVS assessments of the welfare of animals on farms in Great Britain between 1 January and 31 December 2002, based on the farm enterprise. A, Full compliance with legislation and codes; B, compliance with legislation; C, non-compliance with legislation; D, unnecessary pain, unnecessary distress.

Inspection results by welfare criteria

Figure D2.2 (see next page) gives the inspection results by welfare criteria and shows that the major areas which caused serious welfare problems were the lack of care (including the inspection of stock) and treatment, followed by housing.

Figure D2.2: Welfare inspections on farms in Great Britain January–December 2002: welfare criteria



Overall results of SVS assessments of the welfare of animals on farms in Great Britain between 1 January and 31 December 2002, based on the welfare assessment criteria. A, Full compliance with legislation and codes; B, compliance with legislation; C, non-compliance with legislation; D, unnecessary pain, unnecessary distress.

Pigs

A consultation exercise on amendments to the Welfare of Farmed Animals (England) Regulations 2000 (as amended) to implement two pig welfare directives and a revised pig welfare code was launched. These are due for publication in early 2003.

Cattle

A consultation on a revised cattle welfare code was undertaken and the code was due for publication in early 2003.

Poultry

The Welfare of Farmed Animals (England) Regulations 2000 (as amended) were amended to implement a laying hens

directive. A new laying hens welfare code and a new meat chickens and breeding chickens welfare code were both published in July 2002. A consultation exercise on the future of enriched cages in England was launched in 2002.



New poultry welfare codes were published in 2002

Training and support

Defra funded the Agricultural and Development Advisory Service for a series of advisory campaign meetings for farmers on a variety of issues such as 'pig housing for the future', 'improving the health and liveability of free range layers', 'welfare implications for organic beef and sheep production'. In conjunction with Defra, the Agricultural and Development Advisory Service also ran a training course for SVS staff regarding enforcement of the Welfare of Farmed Animals (England) (Amendment) Regulations 2002.

Additionally, Defra helped an industry consortium produce the Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys which were published in March 2002.

Animal Welfare Bill

Work started on a new Animal Welfare Bill during the year, with the aim of consolidating and simplifying current legislation on the welfare of animals kept by humans. A preliminary consultation exercise was launched in January 2002, and an outline of the Bill was announced in October.

In total, 2,500 responses were analysed in drawing up the Bill, which will consolidate and update 21 pieces of animal welfare legislation relating to captive and domestic animals. There was a further opportunity to comment through a series of meetings with representatives from over 100 stakeholder organisations, held between October 2002 and the end of the year. Further information is available at: www.defra.gov.uk/animalh/welfare/default.htm.

Transport and markets

The lifting of the EU ban on the export of FMD-susceptible animals in February 2002 allowed some breeding pigs to be exported. Exports of sheep did not resume until July 2002.

Livestock vessels were inspected for suitability before use. Route plans were carefully scrutinised before issue to ensure proposed journey times were within the maximum for the species and to check the bona fides of destination slaughterhouses. Many loadings were supervised at Assembly Centres by local authority or SVS staff. Hot and cold weather procedures were implemented to help ensure that animals did not travel in weather conditions that might cause suffering.

Inspections at markets

Figure D2.3 gives the results of market

Section D – Chapter D1

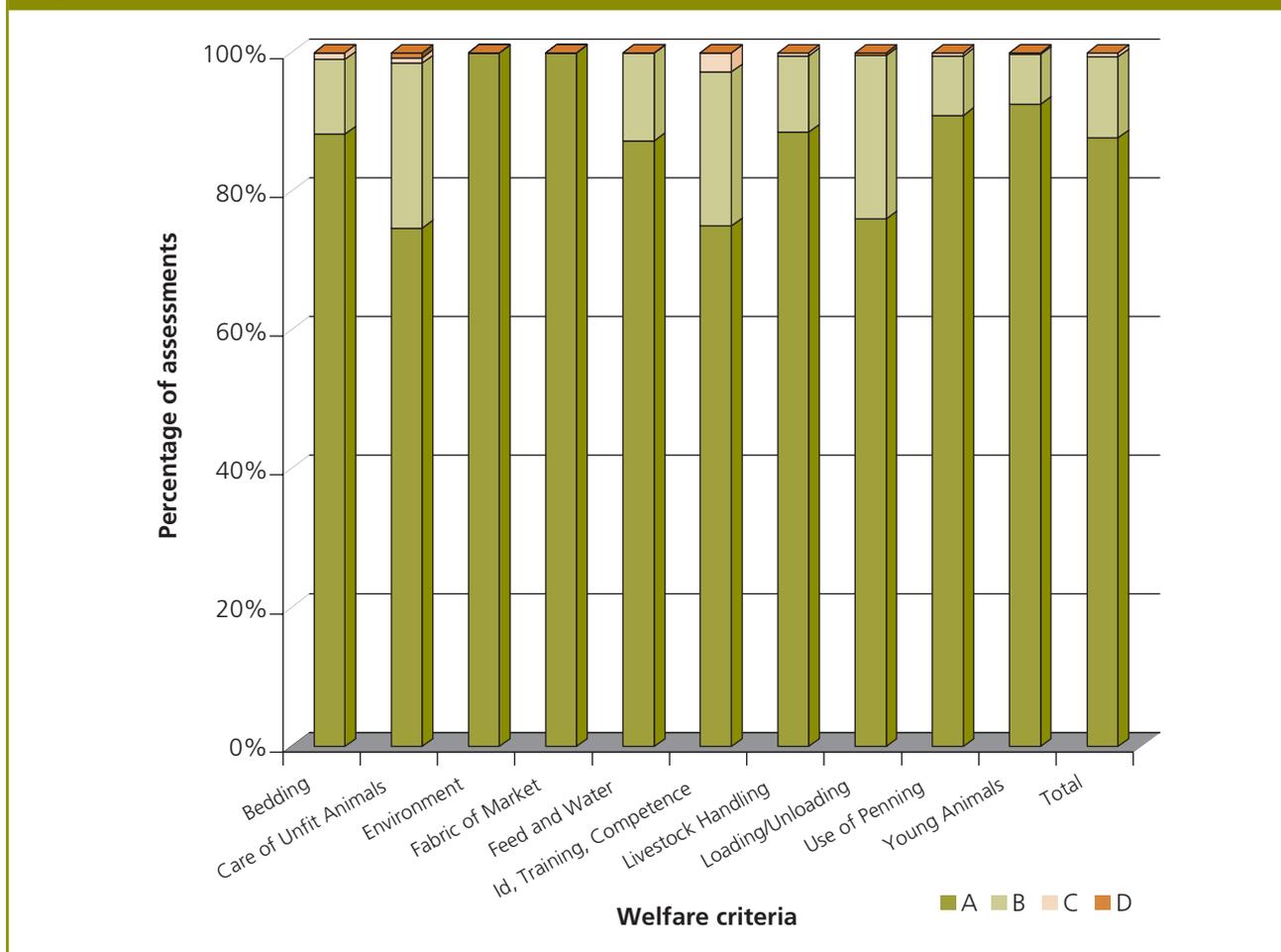
inspections by welfare criteria and shows that the overall results were encouraging, although there were deficiencies with bedding, the care of unfit animals and training/competences.

Protection during transport

The EC proposals to amend Council Directive 91/628/EEC on the protection of animals during transport were still awaited at the end of the year.

The Parliamentary Assembly of the Council of Europe was planning to consider in early

Figure D2.3: Welfare inspections at market in Great Britain January–December 2002



Overall results of SVS assessments of the welfare of animals at markets in Great Britain between 1 January and 31 December 2002, based on the welfare assessment criteria. A, Full compliance with legislation and codes; B, compliance with legislation; C, non-compliance with legislation; D, unnecessary pain, unnecessary distress.



Sheep exports previously banned due to FMD were resumed in 2002

2003 the revised Council of Europe Convention on the Protection of Animals During International Transport, approved during 2002. The Working Party continued drafting the associated Technical Protocols and Codes of Recommendations, assisted by a Drafting Group, during the year.

Framework agreement with local authorities

A framework agreement is being piloted between Defra and Welsh Assembly Government – Agriculture and Rural Affairs Department and local authorities in partnership with LACORS (Local Authority Coordinating Offices on Regulatory Services) covering the delivery of services in animal health and welfare. To assist the framework agreement, a national computer database system is being developed to capture data on national enforcement activity undertaken by local authorities. This framework agreement will help to provide greater consistency in service delivery and will take account of the increased range of activities required of local authorities – where things such as licensing, data capture and traceability of livestock have increased in scale and in importance.

The framework gives the Departments a new opportunity to ensure that local authorities are better informed of their requirements and that key information on veterinary risk and priorities is properly communicated.

Welfare at slaughter

In licensed red meat and poultry slaughterhouses, animal welfare continued to be enforced by the Meat Hygiene Service. The SVS monitored welfare at seasonal poultry slaughter premises and conditions were found to be satisfactory in the majority of cases.

Codes of Practice

Following a public consultation exercise, work continued on producing a new Code of Practice on the welfare of red meat animals at slaughter, with the aim of the code to come into force early in 2003. At the same time, a new Code of Practice on the welfare of poultry at slaughter was also drafted and issued for public consultation. Comments are due back early in 2003.

Amendments to the Welfare of Animals (Slaughter or Killing) Regulations 1995

Further amendments to the Welfare of Animals (Slaughter or Killing) Regulations 1995 are being made, with a view to these coming into force early in 2003.

Training package

In consultation with the Humane Slaughter Association, Defra was in the process of finalising a training package dealing with mass killing of animals for emergency and disease control purposes. The package,

which includes a video, an interactive CD-ROM and a training manual, will be available for distribution in early 2003.

Religious slaughter

In recognising the needs of certain communities to act in accordance with their beliefs, there were regular meetings with representatives of a variety of Muslim organisations to discuss issues of concern to the Muslim community, including the slaughter of animals without prior stunning.

Veterinary Surgeons Act 1966

Veterinary nurses, who have had the appropriate training, and student veterinary nurses, under supervision, are now permitted to carry out medical treatment or minor surgery (not involving entry into a body cavity) on any species of animal. The Veterinary Surgeons Act 1966 (Schedule 3 Amendment) Order 2002 came into effect on 10 June 2002. Previously, veterinary nurses were only permitted to carry out these procedures on companion animals.

From 5 November 2002, The Veterinary Surgery (Rectal Ultrasound Scanning of Bovines) Order 2002 permitted trained and competent non-veterinarians to legally carry out rectal ultrasound scanning for the purposes of detecting whether cows are pregnant. Prior to becoming a qualified scanner operator, and receiving a Certificate of Exemption from Defra, it is a requirement for such persons to attend a Defra-approved training course and carry out a number of supervised scans.

These two amendments are the first steps we have taken in modernising the Veterinary Surgeons Act. A further two Exemption

Orders are being taken forward to allow trained and competent lay people to carry out (a) AI of mares; and (b) certain advanced equine dentistry procedures. We are also in the very early stages of preparing proposals for a completely modernised Act. There have been significant changes within the profession since 1966, including developments in veterinary procedures and equipment. A consultation on these proposals will take place at the earliest opportunity.

Farm Animal Welfare Council

As the Government's independent advisory body, the Farm Animal Welfare Council's remit is continually to review the welfare of farm animals on agricultural land, at market, in transit and at place of slaughter, and to advise Ministers of any legislative or other changes that may be necessary.

The Farm Animal Welfare Council's report *FMD 2001 and Animal Welfare: Lessons for the Future* was published in January 2002, in time to inform the Foot and Mouth Inquiries. At its Open Meeting in June 2002, the Farm Animal Welfare Council reinforced the principle that it enunciated two years earlier that the welfare standards under which farm animals are kept are carried through to become a quality aspect of the resulting food products. This is in line with the concept of 'reconnecting the supply chain' in the report of the Policy Commission on the Future of Farming and Food.

Information on the Farm Animal Welfare Council's activities, including its Annual Review 2001/02, can be found on the Council's Website at: www.fawc.org.uk.

Research and development

The animal welfare research programme continued to contribute to the Defra aim of ensuring high standards of animal health and welfare. The programme is designed to provide the science and information needed to improve the decision-making process. The budget for the 2002/03 financial year was approximately £3.4m.

The Veterinary Animal Welfare Division, together with Animal Welfare Division and the Science Directorate, continued to develop and manage the research programme during the year.

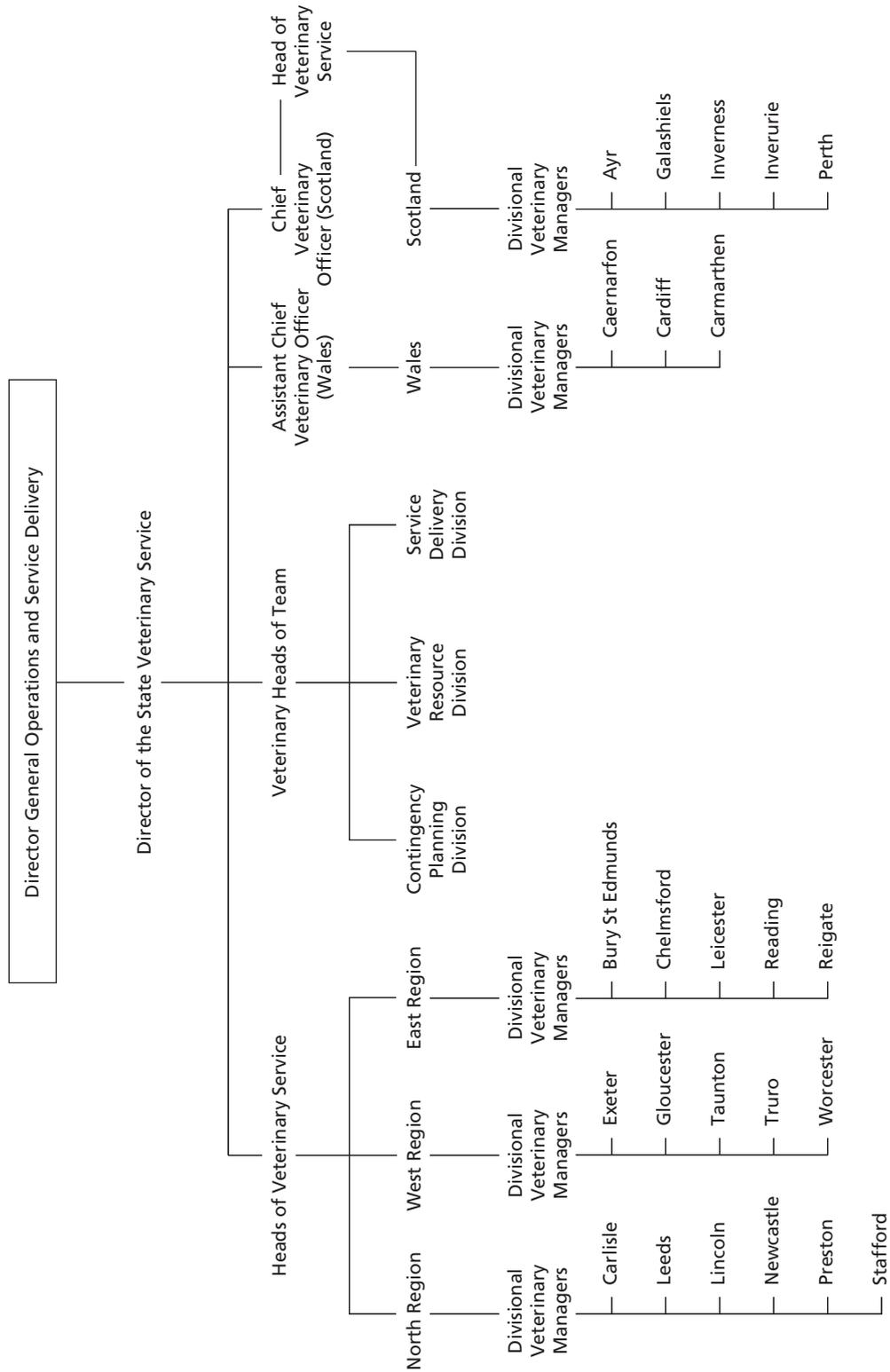
Section E: Appendices

Role of the State Veterinary Service

To assist Defra and other Government Departments in achieving their aims in the field of animal health, public health, animal welfare and international trade by:

- providing timely, up-to-date and objective veterinary advice to Government on all relevant matters, relating to animal health, public health, animal welfare and international trade policies;
- implementing agreed policies efficiently, effectively and in conformity with the legislation;
- monitoring the implementation of policies and providing reliable and timely feedback on their effectiveness or otherwise, to inform the policy process;
- providing advice, guidance and training to the veterinary profession on matters relating to State veterinary medicine.

Senior Management Structure of the State Veterinary Service



Strategy for enhancing veterinary surveillance in the UK: executive summary

1. For the purposes of this strategy, veterinary surveillance is defined as: ‘the ongoing systematic collection and collation of useful information about disease, infection, intoxication or welfare in a defined animal population, closely integrated with the timely dissemination of relevant outputs to stakeholders, including those responsible for control and preventive measures’.

2. The purpose of veterinary surveillance is to detect changes in these areas in the animal population – in particular:

- outbreaks of exotic diseases;
- the appearance of a previously unknown disease which may have zoonotic potential;
- changes in the incidence, prevalence or effects of known conditions.

Prompt detection enables timely and appropriate decisions to be made for the protection of food safety, human or animal health, animal welfare or the environment, and to identify future needs for research. Surveillance is also required to enable us to certify disease freedom for the purposes of international trade in livestock or livestock products.

3. This document is the framework for a transparent strategy for coordinated, risk-based veterinary surveillance, prioritised in accordance with the needs of stakeholders, including interested industries and

professions, and the public. It takes forward the commitment for such a strategy initially given by the former Minister of Agriculture, Fisheries and Food following a review of veterinary surveillance in England and Wales, and takes account of recommendations for enhanced surveillance in other recent enquiries or reports. In particular, the strategy has been developed by Defra, the Scottish Executive, the Welsh Assembly together with the Department for Agriculture for Northern Ireland working in partnership to produce a strategy for the UK. The Strategy covers companion and wild animals as well as all farmed animal species.

4. The current system of surveillance is described together with the International and EU context which surrounds surveillance for a number of diseases and conditions. The relationship between surveillance and risk analysis is explored, and current providers of surveillance information are identified. The particular characteristics of surveillance for exotic diseases and new conditions are outlined, and the existing ‘virtual network’ for coordination of surveillance for new zoonoses is described. The strengths and weaknesses of the current surveillance system are described and solutions proposed to provide a new, strategic approach.

5. To achieve the necessary change, **five strategic goals** are identified. An outline delivery plan is given, with provisional milestones for each strategic goal. The goals are:

- 1 to strengthen collaborations with stakeholders;
- 2 to develop a prioritisation process;
- 3 to derive better value from surveillance information and activities;
- 4 to share information more widely;
- 5 to enhance the quality assurance of outputs.

6. **Improved collaboration** envisages an enlarged network of stakeholders working in partnership both in the planning and funding of surveillance activities, in collecting and sharing samples and data, and in the delivery of outputs. This is seen as vital not only in its own right to ensure efficiency and cost-effectiveness, but also as underpinning the successful delivery of the other strategic goals.

7. To develop a **prioritisation process**, a system is proposed in which 'surveillance profiles' are constructed. Each profile will summarise key information about a disease, indicator or group of similar conditions. This will include epidemiology, significance for different stakeholders, availability of diagnostic tests, pertinent legislation, existing surveillance and a qualitative risk analysis. Stakeholders will assign a risk and impact score, and these scores will form the basis for proposals for ranking different surveillance topics in order of priority.

8. The key to deriving **better value from surveillance** activities is to improve the handling and sharing of data. To this end, a new surveillance IT system is proposed, to be known as RADAR – Rapid Analysis and Detection of Animal Risks. This is envisaged

as a system to capture data from existing systems and data sources, collate the data, and to produce analyses and risk models by using spatial epidemiology or mathematical modelling techniques. A formal scoping study will be required. It is recognised that the long-term goal of a truly integrated dataset will require the redevelopment of existing core systems.

9. The development of RADAR is also central to the **wider sharing of information**. It provides the opportunity to identify the surveillance information and services ('outputs') required by stakeholders. The system can then be designed so that outputs may be provided in a flexible, prompt and convenient manner. The take-up of the outputs should be monitored to ensure they remain relevant, dynamic and targeted. The design of RADAR must also ensure compatibility with other initiatives to promote and standardise national and international sharing of information.

10. **Quality assurance of outputs** is essential if stakeholders are to have full confidence in the information they receive. Surveillance activities should be directed, coordinated and overseen by a suitably qualified and experienced steering group. Input data need not all be of the same quality, but the reliability of the corresponding outputs must be made clear to the recipients. Feedback to data providers is recognised as crucial in improving the quality of input data, which in turn can improve the quality and value of the resulting outputs. A variety of validation and accreditation procedures will be required for different surveillance projects, and audit procedures to monitor their delivery.

11. The ultimate objectives for each strategic goal are to achieve the following:

- a functional and comprehensive network of surveillance partners;
- a functional and functioning prioritisation system which is transparent and responsive to changing situations;
- a flexible and functioning range of approaches to data collation and analysis;
- a widely used, user-friendly system that produces a broad range of both structured and ad hoc reports;
- quality assured surveillance outputs which meet the needs of the users.

12. Appendices include:

- background information on the current arrangements;
- a list of notifiable diseases together with the year of their last occurrence in the UK;
- information on the Surveillance Group on Diseases and Infection of Animals;
- details of the proposed 'surveillance profile', and an analysis of mechanisms of surveillance.

Citizen's Charter

During 2002, a total of 83 complaints were received by 23 Animal Health Divisional Offices; this was 230 fewer than in 2001 and 148 fewer than in 2000. Of the Animal Health Divisional Offices, four received no complaints and only seven received more than three.

The Animal Health Divisional Offices were able to deal with 82 satisfactorily at a local level and the other one was dealt with by the Permanent Secretary of Defra.

Table E1: Complaints received by Animal Health Divisional Offices during 2002

Subject of complaint	Number	Dealt with by
Transmissible spongiform encephalopathies (TSEs)	8	Local office
Tuberculosis	35	Local office
Veterinary medicine	0	
Brucellosis eradication	3	Local office
Salmonella and other zoonoses	0	
Imports and exports of animals and genetic material	13	12 by local office 1 by Permanent Secretary
Control of notifiable diseases other than BSE	16	Local office
Animal breeding controls	0	
Welfare of farm, markets and in transit	7	Local office
Welfare at slaughter	1	Local office

Table E2: Number of stock slaughtered and compensation paid in Great Britain 1997–2002												
	1997		1998		1999		2000		2001		2002	
	No.	£	No.	£	No.	£	No.	£	No.	£	No.	£
Bovine Tuberculosis (cattle)												
a) Affected animals	–	–	–	–	–	–	–	–	–	–	–	–
b) Reactors and dangerous contacts	3,760	2,386,029	*5,863	3,605,242	*6,772	5,770,983	*8,353	7,307,797	*5,916	7,074,125	22,886	23,138,512
Total Bovine Tuberculosis (cattle)	3,760	2,386,029	*5,863	3,605,242	*6,772	5,770,983	*8,353	7,307,797	*5,916	7,074,125	22,886	23,138,512
Bovine Tuberculosis (deer) ⁽³⁾												
a) Affected animals	11	–	37	–	49	–	25	–	2	–	–	–
b) Reactors and dangerous contacts	0	0	6	0	6	0	6	0	0	0	N/A	1,200
Total Bovine Tuberculosis (Deer)	11	0	43	0	55	0	31	0	2	0	N/A	1,200
Aujeszky's Disease (pigs) ⁽¹⁾	–	–	–	–	–	–	–	–	–	–	–	–
Bovine Spongiform Encephalopathy ⁽²⁾	5,313	3,027,379	4,046	2,095,114	2,857	1,342,214	1,798	712,025	1,153	576,582	882	527,994
FMD	–	–	–	–	–	–	–	–	4,200,000	3,999,300	–	399,750
Scrapie (4)	–	–	285	5,397	715	14,795	646	15,610	355	9,434	493	56,418
Avian Influenza	–	–	–	–	–	–	–	–	–	–	–	–
Newcastle Disease	648,000	3,966,462	–	224,809	–	–	–	–	–	–	–	–
Classical Swine Fever (pigs)	–	–	–	–	–	–	74,793	4,392,101	–	–	–	–
Swine Vesicular Disease	–	–	–	–	–	–	–	–	–	–	–	–
Total Compensation	657,084	9,379,870	10,237	5,930,562	10,399	7,127,992	85,621	12,427,533	4,201,508	11,659,441	24,261	24,123,874

(1) The cost of the eradication scheme was met by the pig industry
(2) Compulsory slaughter with compensation commenced 8 August 1988
(3) Compulsory slaughter with compensation for deer was introduced on 1 September 1989
(4) Compulsory slaughter with compensation commenced on 29 July 1998

* Revised figures
** Provisional figures

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Table E3: Outbreaks of notifiable diseases, excluding TB, in each county of Great Britain during 2002

County	Anthrax	Scrapie (a)	CSF	FMD	EBL	PVM in pigeons	ND	BSE (b)	CEM	EVA
ENGLAND										
Avon										
Bedfordshire										
Berkshire										
Buckinghamshire										
Cambridgeshire										
Cheshire										
Cleveland						1				
Cornwall										
Cumbria						1				
Derbyshire										
Devon										
Dorset										
Durham										
East Sussex										
East Yorkshire						1				
Essex										
Gloucestershire						3		1		
Greater London						1				
Hampshire						2				
Here & Worc										
Hertfordshire										
Humberside										
Isles of Scilly										
Isle of Wight										
Kent						1				
Lancashire						1				
Leicestershire										
Lincolnshire						1				

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Table E3: Outbreaks of notifiable diseases, excluding TB, in each county of Great Britain during 2002 (*continued*)

County	Anthrax	Scrapie (a)	CSF	FMD	EBL	PVM in pigeons	ND	BSE (b)	CEM	EVA
Manchester										
Merseyside						1				
Norfolk										
North Yorkshire										
Northamptonshire										
Northumberland						1				
Nottinghamshire										
Oxfordshire						1				
Shropshire										
Somerset										
South Yorkshire										
Staffordshire									1	
Suffolk										
Surrey										
Teesside										
Tyne & Wear						3				
Warwickshire						1				
West Midlands										
West Sussex										
West Yorkshire						1				
Wiltshire										
Worcestershire										
ENGLAND TOTAL:-						20				0

County	Anthrax	Scrapie (a)	CSF	FMD	EBL	PVM in pigeons	ND	BSE (b)	CEM	EVA
WALES										
Anglesey										
Carmarthenshire										
Clwyd	1									

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Table E3: Outbreaks of notifiable diseases, excluding TB, in each county of Great Britain during 2002 (continued)

Dyfed										
Gwent										
Gwynedd										
Mid Glamorgan										
Monmouthshire										
Powys										
South Glamorgan										
West Glamorgan										
WALES TOTAL:-	1									

County	Anthrax	Scrapie (a)	CSF	FMD	EBL	PVM in pigeons	ND	BSE (b)	CEM	EVA
SCOTLAND										
Borders										
Central										
Dumfries & Galloway										
Fife										
Grampian										
Highland										
Lothian						2				
Orkney & Shetlands										
Strathclyde						2				
Tayside										
Western Isles										
SCOTLAND TOTAL:-						4				
GREAT BRITAIN TOTAL:-	1	579*	-	-	-	24	-	1044*	2	-

NB Several counties and boundaries have changed since some diseases were first diagnosed. The original county names have been kept for continuity of figures.

* A full breakdown by county is not available at present

(a) Please note there are still some 2,002 cases awaiting completion

(b) Please note there are different reporting county boundaries for Passive and Active surveillance

Legislation

Acts passed in 2002

Animal Health Act 2002

Acts revoked in 2002

Nil

General Orders and Regulations made in 2002

The Agriculture Act 1970

The European Communities Act 1972

The Import and Export Restrictions (Foot-and-Mouth Disease) Regulations 2002 (Commission Decision 2001/938/EC)

The Import and Export Restrictions (Foot-and-Mouth Disease) (No. 2) Regulations 2002 (Commission Decision 2002/37/EC)

The Import and Export Restrictions (Foot-and-Mouth Disease) (No. 3) Regulations 2002 (Commission Decision 2002/48/EC)

The Foot-and-Mouth Disease (Marking of Meat, Meat Preparations and Meat Products) Regulations 2002 (Commission Decision 2002/49/EC)

Animals and Animal Products (Import and Export) (England & Wales) (Amendment) (England) Regulations 2002 (Commission Decision 2002/153/EC)

The Animals and Animal Products (Import and Export) (England & Wales) (Amendment) (England) (No. 2) Regulations 2002

The Products of Animal Origin (Third Country Imports) (England) Regulations 2002 (Council Directive 97/78/EC)

TSE (England) Regulations 2002

TSE (England) (Amendment) Regulations 2002

Food Safety Act 1990

The Artificial Insemination of Cattle (Animal Health) (Amendment) (England) Regulations 2002

The Artificial Insemination of Cattle (Animal Health) (Amendment) (Wales) Regulations 2002

The Artificial Insemination of Cattle (Animal Health) (Amendment) (Scotland) Regulations 2002

Agricultural (Miscellaneous Provisions Act) 1968

Animal Health Act 1981

The Pet Travel Scheme (Pilot Arrangements) (England) (Amendment) Order 2002

The Pet Travel Scheme (Pilot Arrangements) (England) (Amendment) (No. 2) Order 2002

The Poultry Breeding Flocks, Hatcheries and Animal By-Products (Fees) (England) Order 2002 (Statutory Instruments 2002 No. 2875)

General Orders and Regulations revoked in 2002

The Import and Export Restrictions (Foot-and-Mouth Disease) (No. 3) (Revocation) Regulations 2002 (Commission Decision 2002/153/EC)

The Bovine Spongiform Encephalopathy (No. 2) Order 1996

The Bovine Spongiform Encephalopathy Compensation Order 1996

The Fertilisers (Mammalian Meat and Bone Meal) Regulations 1998

The Fertilisers (Mammalian Meat and Bone Meal) (Conditions of Manufacture) Regulations 1998

The Sheep and Goats Spongiform Encephalopathy Regulations 1998

The Sheep and Goats Spongiform Encephalopathy (Compensation) Order 1998

The BSE Offspring Slaughter Regulations 1998

The Bovine Spongiform Encephalopathy (Feeding Stuffs and Surveillance) Regulations 1999

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The Specified Risk Material Regulations 1997

The Processed Animal Protein (England) Regulations 2001

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State Veterinary Journal **12** (1) 9–12

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State Veterinary Journal **11** (1) 8–11

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Avian Pathology **31** (1) 81–93

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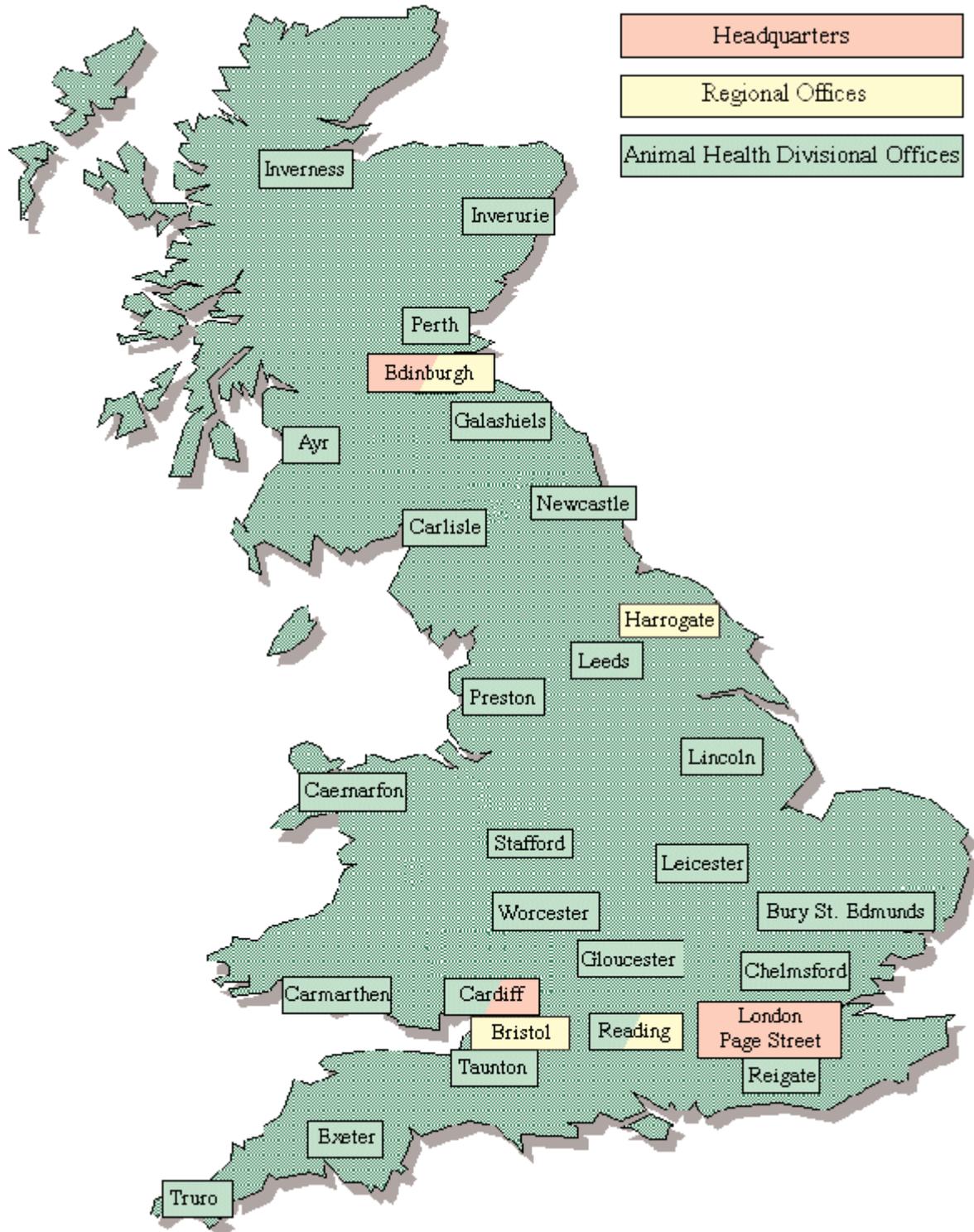
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Map showing headquarters and Animal Health Divisional Offices in Great Britain



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Cleveland covered by Newcastle

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Section E – Appendices

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Section E – Appendices

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Abbreviations/acronyms

A	AI	artificial insemination
	AHO	Animal Health Officer
B	BIP	Border Inspection Post
	BSE	bovine spongiform encephalopathy
	BTV	bluetongue virus
	BVD	bovine viral diarrhoea
C	CEM	contagious equine metritis
	CSF	classical swine fever
D	DBES	Date Based Export Scheme
	Defra	Department for Environment, Food and Rural Affairs
	DH	Department of Health
E	EC	European Community
	ELISA	enzyme-linked immunosorbent assay
	EU	European Union
F	FMD	foot-and-mouth disease
	FSA	Food Standards Agency
I	IFN - γ	gamma interferon
	ISG	Independent Scientific Group
L	LACORS	Local Authority Co-ordinating Offices on Regulatory Services
	LGC	Laboratory of the Government Chemist
N	NAWAD	National Assembly for Wales Agriculture Department
	NSP	National Scrapie Plan
O	OIE	Office International des Epizooties
P	PCR	polymerase chain reaction
	PDNS	porcine dermatitis nephropathy syndrome
	PETS	Pet Travel Scheme
	PMWS	post-weaning multisystemic wasting syndrome
R	RBCT	Randomised Badger Culling Trial
	RBST	Rare Breeds Survival Trust
	RT-PCR	reverse transcription polymerase chain reaction

Section E – Appendices

S	SEERAD SVS	Scottish Executive Environment and Rural Affairs Department State Veterinary Service
T	TB TSE	Tuberculosis transmissible spongiform encephalopathy
U	UK	United Kingdom (England, Scotland, Wales and Northern Ireland)
V	VLA VMD VTEC O157	Veterinary Laboratories Agency Veterinary Medicines Directorate verocytotoxin-producing <i>Escherichia coli</i> O157

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