

Control of foot and mouth disease: lessons from the experience of the outbreak in Great Britain in 2001

J.M. Scudamore & D.M. Harris

Department for Environment, Food and Rural Affairs (DEFRA), State Veterinary Service, 1A Page Street, London, SW1P 4PQ, United Kingdom

Summary

An epidemic of foot and mouth disease occurred on an unprecedented scale in Great Britain in 2001. This was characterised by widespread dissemination of disease in sheep due to infection being present but unreported for at least three weeks before the first case was identified. As envisaged by the contingency plans, existing procedures dealt rapidly with disease in many parts of the country where outbreaks were reported. Elsewhere, the scale and speed of disease spread was so great that veterinary resources had to be supplemented on the operational front by a large influx of military and administrative support.

At the time of writing (June 2002), the United Kingdom Government has already identified a number of key lessons, and will learn further from this experience and from the findings of inquiries, how a future outbreak of this unprecedented nature and extent could be handled. Lessons identified so far relate to the improvement of contingency plans, the wider impact on rural businesses and communities, reassessing the possible use of emergency vaccination, the availability of serological capacity, better animal identification and movement controls, carcass disposal, communications, data handling and management information.

The authors present the initial lessons learned and which formed the basis of official submissions to the inquiries. Further lessons will be learned from the findings of those inquiries.

Keywords

Communication – Control – Emergency management – Epidemics – Foot and mouth disease – Great Britain – United Kingdom.

Introduction

Foot and mouth disease outbreaks in the United Kingdom, from 1918 to 2001

Between 1918 and 1967, the United Kingdom (UK) enjoyed only two years (1963 and 1964) of freedom from outbreaks of foot and mouth disease (FMD). Excluding 1922 to 1924 when a total of 4,509 outbreaks were recorded, the average annual number of cases was 112 with a range from 5 to 670. A major outbreak in 1967 and 1968 involved 2,364 infected premises (IPs) and 407,341 animals were slaughtered. Between 1968 and February 2001, only one outbreak occurred that was contained on the Isle of Wight in 1981.

On 19 February 2001, FMD was suspected in cull sows at an abattoir. Disease was confirmed on 20 February.

Overview of the foot and mouth disease outbreak in 2001

Following confirmation of FMD in cull sows at an abattoir in Essex on 20 February 2001, epidemiological inquiries rapidly identified a pig finishing unit that was licensed to feed catering waste as the origin of the outbreak and of the epidemic as a whole.

Disease had gone unreported for at least three weeks, during which time sheep on neighbouring premises became infected,

probably by local airborne spread. The movement to livestock markets of these animals, which were incubating disease, before any report of suspicion was received by the State Veterinary Service (SVS) meant that the virus was already widely geographically disseminated by 20 February when the first outbreak was confirmed. By that date, disease was present on at least 57 premises, affecting 16 of the 23 counties that were eventually involved. Disease had already spread to Cumbria, Devon, North Yorkshire, Northumberland, Dumfries and Galloway, County Durham and Hereford, the areas which were ultimately the most severely affected by the epidemic.

Before disease was eradicated, animals on 2,026 infected farms in Great Britain (and an additional four in Northern Ireland) had been compulsorily slaughtered. In addition, animals considered to have been exposed to disease were also slaughtered on a further 8,000 premises.

In total, 4 million animals were slaughtered for disease control purposes with another 2.5 million killed on welfare grounds. No further outbreaks occurred after 30 September 2001 and the status of the UK as 'FMD-free without vaccination' was restored by the Office International des Epizooties (OIE: World organisation for animal health) on 22 January 2002.

Disease control was co-ordinated through the Departmental Emergency Control Centre (DECC) located at the Headquarters of the SVS in London. Local Disease Control Centres (LDCC) were established in those parts of the country where outbreaks of disease occurred. In most cases, LDCCs were established at the Animal Health Divisional Offices (AHDO) where the veterinary and technical staff of the SVS are located.

The 2001 FMD epidemic followed an outbreak of classical swine fever (CSF) (hog cholera) in 2000. The latter involved 16 IPs and was successfully contained within East Anglia.

Lessons learned

General

The outbreak of CSF in 2000 proved that, whilst existing instructions were fundamentally sound for dealing with outbreaks of exotic notifiable diseases, lessons could be, and were, rapidly learnt and implemented both during and in the aftermath of disease. Lessons learnt directly affected the response to the FMD outbreak. For example, the imposition of movement controls on premises where short management cycles require regular movement of stock between premises could result in overstocking. The need to provide an alternative route for the removal of such animals not affected directly by disease was addressed by the Pig Welfare (Disposal) Scheme. This provided the blueprint for the Livestock Welfare (Disposal) Scheme (LWDS) used during the FMD epidemic.

During the foot and mouth disease outbreak

Lessons were learnt throughout the 2001 FMD epidemic at every level within SVS and the Department for Environment, Food and Rural Affairs (DEFRA). Some were practical lessons on disease control procedures whilst others were specific to the outbreak. The characteristics of the causative agent, the species of animal primarily involved (sheep in the 2001 epidemic) and the way that an outbreak will develop cannot be predicted in advance. Information from the field and the laboratory provided data for the veterinary managers, epidemiologists and scientists to inform policy-makers.

The post-outbreak period

The internal process of acting upon the lessons learnt continues. This includes updating national and local contingency plans to take account of the experience gained during the 2001 epidemic, together with a review of planning for all other exotic diseases. In addition, a number of inquiries into the handling of the outbreak have been conducted, the findings of which will undoubtedly highlight further lessons that must be learnt.

The National Audit Office scrutinises public spending on behalf of Parliament (3).

Scope of examination

The scope of the examination was 'to consider contingency planning, handling of the crisis, cost effectiveness and cost'. The principal findings of the National Audit Office were reported on 21 June 2002 as follows:

- the nature and scale of the 2001 outbreak were unprecedented
- DEFRA had prepared contingency plans which met European Union (EU) requirements
- the contingency plans of DEFRA were not sufficient to deal with an outbreak on this scale
- following eradication of the disease, DEFRA is revising contingency plans.

The Government commissioned three further inquiries by the following:

a) Sir B. Follet (Royal Society)

The aim of the inquiry was 'to review scientific questions relating to the transmission, prevention and control of epidemic outbreaks of infectious disease in livestock in Great Britain' (9).

b) Dr I. Anderson ('Lessons Learned')

This inquiry aimed at making 'recommendations for the way in which the Government should handle any future major animal disease outbreak in the light of the lessons identified from the handling of the 2001 FMD outbreak in Great Britain' (1).

c) Sir D. Curry

This inquiry considered the future of food and farming and reported in January 2002. Whilst not directly examining the

handling of the FMD outbreak, a number of pertinent observations were made, as follows:

- development of an animal health strategy
- the need for the industry to maintain sound biosecurity
- strengthening of checks and control of illegal imports of meat products
- increased consultation with the industry on animal health issues (7).

In addition, a number of local inquiries have been conducted by the County Councils of Devon, Northumberland, Gloucestershire, Shropshire and Cumbria. With a more restricted remit, they reported more rapidly on how the disease affected each area and the lessons they considered had to be learned. Although these inquiries considered local impact, they provide useful lessons for DEFRA.

An EU conference on FMD in December 2001 demonstrated the value of an international forum for discussing and taking forward consideration of issues including vaccination as an alternative to 'stamping-out' disease (11). The outcome of this conference will inform discussions on new EU legislation for the control of FMD currently set down in Council Directive 85/511 (6). An International Symposium on control strategies in June 2002 also provided an opportunity for an exchange of ideas and experiences (4).

Lessons learned

The lessons already learned include the need for the following:

- effective, large-scale operational contingency plans
- disease control policies that take full account of the wider rural policy context including mitigating the impact on rural businesses and communities
- consideration of the role of vaccination to control FMD by discussion within the EU and by research
- maintaining the availability of adequate laboratory diagnostic capacity
- further development of animal identification and movement controls
- planning for disposal options
- development of generally applicable lessons on improving communications, data management and management information.

Areas have been identified where existing policies had been successfully implemented during the outbreak, which emphasised the importance of maintaining existing practices that have been found to function particularly well. This

includes the use of independent and public scientific advice and the benefits of engaging early and effectively with other countries, in particular with other EU member states and the European Commission (EC).

In the early stages of the epidemic, exchange of information and experience in this regard took second place to the pressing need to fight widespread disease. This inevitably meant some duplication of effort and 're-inventing of the wheel' although this has helped to provide a wide base of expertise throughout DEFRA, and beyond, which has been put to good use in the ongoing process of updating instructions and plans.

Contingency plans

The Government had existing contingency plans prepared according to EU criteria (8). These were based on available knowledge and international experience at that time and represented the accepted international standard for such plans. The plans were required to deal with the most likely scenario, that of a local epidemic of up to ten simultaneous cases and subsequent tracings, most likely involving cattle and pigs. The plan was implemented effectively at the start of the outbreak but the unprecedented range and nature of the outbreak in the UK meant that the demands placed on the Government exceeded those that had been anticipated in terms of resources and some aspects of control strategy.

In October 2001, revision and updating of existing detailed local plans and veterinary guidance began. The experience gained from the epidemic was also codified into updated operational contingency plans. These will also ensure that dealing with a future disease outbreak takes full account of the wider impact of the disease on the rural economy and the need to protect the environment and human health. Other member states and countries elsewhere are also reviewing and revising their plans which, similarly to those of the UK, were based on the expectation of an outbreak occurring on a similar scale to those previously experienced.

The Government has identified a number of actions that may need to be taken, although these will be subjected to a specific veterinary risk assessment in the event of an outbreak to ensure that the response is proportionate. The Government will also take account of the findings of the inquiries that are being undertaken and will revise the plan of action if necessary.

The actions that will be taken are as follows:

- all movements of susceptible animals would be stopped throughout the country once the first case was confirmed
- infected areas and surveillance zones would be introduced, imposing movement restrictions and strict biosecurity requirements

- animals on IPs would be culled within 24 hours of report
- susceptible animals on premises contiguous to the IPs would be culled within 48 hours, subject to veterinary judgement
- dangerous contacts would be traced and slaughtered as rapidly as possible
- emergency vaccination would be considered as a separate strategy, but not as an alternative to slaughter in the first instance
- footpaths would be closed within infected areas only following a veterinary risk assessment.

To address the broader issues of preparedness and the detailed structures and staffing required for the operation to function effectively, the plan will cover the following aspects of disease control:

- a) carcass disposal routes
- b) procurement and contract management
- c) financial structures and systems
- d) information technology (IT) systems
- e) management information
- f) communications
 - within DEFRA
 - between organisations involved
 - with the farming and wider community
- g) staff resources
 - availability of other Government staff to manage the operation
 - co-operation with other agencies concerned, such as the Environment Agency, Government Offices and local authorities
 - involvement of the armed forces.

No contingency plan can ever be considered finalised or complete. A contingency plan is a living and constantly evolving document, a process to which the highest priority must be given.

A contingency plan must allow implementation of different components or procedures in particular instances in response to the situation at that time. Each outbreak is unique, so a flexible and adaptable approach is required.

The plan must be updated and amended to ensure that policy developments, operational experience, perceived risks and recommendations from all recognised authorities are reflected.

All those involved in, or affected by, the plan should participate in the development thereof and have access to the current version.

There should be national and local simulation exercises to test plans in the light of current knowledge and practices to ensure they provide an effective response to deal with FMD and other diseases.

Epidemiology unit

Veterinary officers from the SVS conduct routine epidemiological investigations in the course of their other activities, such as investigations into tuberculosis (TB) and bovine spongiform encephalopathy (BSE). There is in-house epidemiological training whilst some officers have post-graduate qualifications in epidemiology.

During the CSF outbreak in 2000, a team of specialist veterinary officers was established to conduct detailed epidemiology inquiries on farms, at markets and in companies that visited livestock premises.

A similar system was used during the FMD epidemic in 2001. Local epidemiological teams were established in each LDCC reporting to the Chief Veterinary Officer (CVO) at SVS Headquarters. This included highly experienced SVS staff, experts from the Institute for Animal Health (IAH) in Pirbright, the Veterinary Laboratories Agency (VLA) and epidemiologists from abroad.

The Headquarters team acted as the focus for all information from the field and provided an epidemiological overview, allowing policy-makers and senior veterinary managers to be better advised on the way the outbreak was developing so that they could determine what strategy was required to combat the disease.

Risk assessment unit

During an outbreak, measures must be introduced, based on available information, which will result in minimising disease spread. As more information on the nature of the disease and the epidemic is obtained, consideration can be given to amending those measures, usually by relaxation. To allow an informed decision to be made on the nature, extent and implementation of any amendment, the CVO established a risk assessment unit. This included experienced state veterinarians and internationally recognised experts in FMD and in risk analysis. Thirty-three formal risk assessments were performed and published. In addition, the unit provided advice to policy-makers and veterinary managers on many other aspects of disease control.

Throughout the outbreak, great efforts were made to allow normalisation of agricultural practices and to address other demands on the countryside for tourism and different businesses. Relaxation of disease control measures could only take place if it could be shown there would not be an

unacceptable increase in the risk of the disease spreading. This was a role of the risk assessment unit. The consequences of disease control measures sometimes went far beyond the livestock industry and had major effects on tourism and other rural businesses.

Before any change to the measures was allowed, effective guidance, advice, legislation and infrastructure had to be implemented.

Serology

Perhaps the most striking and epidemiologically significant feature of the 2001 FMD epidemic was that the disease occurred principally in sheep. As clinical signs are not always obvious in this species, serology was of great importance.

Serology was used as follows:

- to aid diagnosis
- to provide epidemiological information
- to allow restrictions to be lifted in infected areas
- to carry out surveillance sampling to attain disease freedom
- to allow movements of livestock.

The existing high-containment laboratory facilities and testing capacity at the IAH at Pirbright rapidly proved insufficient to process increasing demands. To increase capacity of an acceptable standard of disease containment, DEFRA funded improvements to laboratories at the Centre for Applied Microbiological Research (Porton Down), the Animal Health Trust (Newmarket) and VLA Regional Laboratories at Penrith, Shrewsbury and Luddington.

This was a major achievement, which increased weekly capacity from 400 to over 200,000 tests, in time to deal with the numerous samples taken through the autumn as major efforts were made to lift restrictions. This action also enabled the UK to achieve FMD-free status rapidly after the epidemic ended.

To ensure that sampling of animals was undertaken as rapidly as possible, hundreds of lay blood samplers were successfully trained and supervised. Contingency plans for serology testing on a mass scale include a mechanism for the rapid commissioning of laboratories.

To allow area restrictions to be lifted at the earliest opportunity, there must be confidence that disease is not present. A characteristic of the outbreak in 2001 was the transience of clinical signs in sheep. This meant that extensive, statistically based serological surveillance was essential to achieve disease freedom.

Carcass disposal

A paper on the lessons learned concerning carcass disposal is also published in this volume (10). During the course of this outbreak, an agreed disposal hierarchy was developed and followed, striking the difficult balance between disease control, protecting the environment and avoiding risk to public health.

Disposal of carcasses, particularly the use of burning and burial, aroused the most public reaction with demonstrations by local residents against the use of some mass burial sites. There is a need to ensure that sufficiently biosecure disposal routes are available immediately, which can be operated within environmental and other constraints and where possible, are acceptable to the public.

Communications

Internal

The importance of communications between, and within, the many components of a co-ordinated response to FMD was highlighted by this outbreak.

Communications between the field and head office allow the distribution of instructions and the exchange of intelligence on the disease situation. Unless an accurate real-time ground picture can be obtained, the many demands for resources such as veterinarians, animal health and field officers, slaughtermen, managers, administrators, equipment, vehicles and disposal capacity are difficult to assess.

External

Actions must be carried out in an open and transparent manner. This is useful in increasing awareness and understanding of roles and responsibilities by the industry and public but must never be permitted to delay decisions and disease eradication actions.

Farming industry

Communications with representatives of those most directly affected (the stakeholders) are crucial to the success of any campaign to control disease. Ensuring that all those with a role to play in preventing the spread of disease understand and meet their personal responsibilities is critical to the success of any disease control programme.

Regular weekly meetings with the national stakeholder organisations – extending well beyond the food and farming sectors – proved an invaluable means of two-way communication and joint problem-solving.

Not all livestock keepers are members of industry organisations or associations and therefore will not receive advice from the stakeholder representatives. It was important that DEFRA

directly provide timely, useful and practical guidance to all livestock keepers. This was performed in a number of ways.

Whilst the value of the DEFRA internet site for providing rapid, up-to-date information was understood, the limited access to that medium by many in the farming sector was also appreciated. Direct mailings of all important advice were made to every registered livestock keeper, supported by advertisements in the farming press, radio advertisements, interviews on local television and radio and by providing telephone help lines.

Effective communication

Communication on all aspects of the disease, control of the disease and the impact on the countryside must be straightforward and timely. This can be difficult at a time of crisis, but all methods must be exploited to improve the information that can be given, the accuracy of the information and the speed at which it is provided.

Much was achieved during the epidemic, both centrally and locally, but DEFRA is striving to improve public communications and to provide information that is timely, factual and clear, to demonstrate openness and provide accessibility to information and to key personnel. It is particularly important that all within Government who provide information to the public, from ministers to case officers managing a cull on a farm, be well informed, up-to-date and able to explain the policy that is being implemented.

There are also lessons to be learned on presenting Government policies abroad, especially when the media is concentrating on negative stories. Communications must provide positive information focused on the particular concerns of individual countries. In all these areas, efforts begun during the epidemic will be maintained.

Management information

The battle against the epidemic was conducted in a very public arena with a constant demand for accurate, detailed and timely information data and statistics on all aspects of the disease control operation. Much information was provided to ministers, Parliament, the EC and member states, the OIE, overseas administrations and embassies, the press and the public.

Disease Control Systems

A Disease Control System (DCS) is a single database which combines all disease control data. Initial problems with data entry meant the DCS could not easily provide the management information required and as the system had been developed solely in relation to disease control, it could not easily be integrated with the financial management system. All these issues are now being addressed with the aim of producing an

integrated system which takes full account of the need for detailed management information across all aspects of a disease and disease control. Upgrading existing spreadsheet-based systems was found to be inadequate to handle the volume of data generated by an outbreak of this scale.

Geographic information systems

The value of a geographic information system (GIS), already recognised during the CSF outbreak, was confirmed by use during the FMD epidemic at both local and national levels. The GIS provided location data and allowed separate databases to be combined to provide graphical representations of disease status. The production of high quality and specific maps, greatly helped the effort to deal with the disease and to explain the process to others. The GIS is a data handling tool that will play an increasing role in any future disease outbreak and resources are being made available to ensure such a tool is available.

Structural and organisational changes

Permanent structural and organisational changes have already been made, and others identified; these would come into effect in an emergency.

The creation of the DEFRA in June 2001 united government responsibilities for farming, fisheries and the food chain with other aspects of the rural economy and environmental protection. This allows development of all rural and agricultural policy to be handled in a co-ordinated and coherent way which will help to ensure that all aspects of rural life and the environment are fully considered in any future outbreak of animal disease.

The Civil Contingencies Secretariat within the national administration of the UK is a co-ordinating body and centre of expertise set up to improve the response of central government and the UK. The purpose of the Secretariat is to make the country more effective in planning for, dealing with, and learning lessons from, emergencies and disasters. The Secretariat provides integrated planning and thinking and co-ordinates action across departments. The tasks of the Secretariat are to identify potential crises, to help departments pre-empt or handle them, and to manage any necessary co-ordination.

Two new Directorates were established within DEFRA.

The CVO became the Director General of Animal Health and Welfare, responsible for policy on all animal health, welfare and veterinary matters.

A position of Director General of Operations and Service Delivery (DGOSD) was established, with responsibilities

including the delivery of field services. Response during an emergency should be improved by this directorate. In the event of any future disease outbreak, the entire field operation would be within the command of the DGOSD, to ensure effective delivery across the range of agencies involved in outbreak control which extend beyond veterinary considerations.

This change will promote joint working, a more integrated and co-ordinated service to key customers, more integrated IT and a shared use of premises and support. The change will help in designing more resilient structures and improve emergency response arrangements. Many of these advantages were apparent during the FMD epidemic and the co-operative working arrangements established then have contributed to this change in structure.

The benefits of a broad cross-departmental approach to handling problems, particularly those that affect much of the country, were recognised.

The need to engage all stakeholders and interested organisations, particularly locally based organisations, in developing the approach to policy and operational issues was appreciated.

Liaison and co-operative working should take place at all times so that prior to an emergency, all parties will fully understand their roles and responsibilities so as to act in the most effective way.

Clear lines of management

Clear lines of management are important to allow all staff to understand their roles, actions and responsibilities and to ensure they are aware of where to seek further guidance, either for themselves or for others affected by the outbreak. This is of particular importance where many agencies with whom SVS would not normally work are involved in disease control.

Within the SVS, the following management system was rapidly established and, with modifications in response to the developing situation, provided the framework of the management throughout the outbreak.

Local management

Implementation of policy, allocation of tasks and co-ordination of activity were undertaken by the LDCC under the existing management of the Divisional Veterinary Manager (DVM), complemented by a Regional Operations Director (ROD) and Military Commander. Regular briefings brought these together to maintain an effective and co-ordinated response.

Head Office

Within head office, two separate, but closely linked management structures were developed to handle different aspects of the epidemic.

Departmental Emergency Control Centre

As with the CSF outbreak, a national Departmental Emergency Control Centre (DECC) was established within 24 hours of confirmation of FMD. This was the single central point to which all suspicions of disease were reported and from where disease on a premises would be confirmed by or on behalf of the CVO. The centre collated data from the field on all aspects of disease control and included the epidemiology unit.

Joint Co-ordination Centre

This outbreak of FMD saw the innovative approach of using a Joint Co-ordination Centre (JCC) as an effective response to the need for greater co-ordination and co-operation within DEFRA, across Government, with the armed forces, and with many agencies and non-governmental organisations.

The structure and organisation of the JCC encouraged swift exchange of information, allowing solutions to be rapidly found to problems as, or before, they developed. Regular briefings kept all members informed and ensured rapid and integrated action on operational issues.

The agencies most closely involved in disease control and some major stakeholders maintained a presence. The JCC was also the point where the veterinary, operational and military commands united at the national level.

The JCC was considered a success and will be used in future animal disease outbreaks as an immediate element of the interim contingency plan.

Vaccination

The circumstances within which emergency vaccination may be used to aid in the control of FMD are set down in EU legislation. The future role of vaccination in FMD control, given the recent advances in discriminatory testing, will no doubt be considered at EU level and within the wider international community. The UK will continue to contribute to discussions on the revised proposal for a new EC directive to control FMD. The experience of the FMD outbreak in 2001 and the findings of the EU conference on FMD, which recognised that the EC needed to be able to respond rapidly and flexibly to future outbreaks and that the appropriate response might include emergency vaccination, will be taken into account in the deliberations on the directive.

Contingency planning includes identifying potential vaccination centres and their requirements, and updating instructions for running a campaign. Experience shows that fixed trigger points for vaccination are difficult to define, due to the many variables involved in different outbreaks.

Animal identification and movement controls

This FMD epidemic reinforced the importance of establishing individual identification of sheep and the UK is supporting the efforts of the EC to improve identification, tracing and movement controls of sheep. The EC is in favour of electronic identification, as the large numbers involved, together with the difficulties of tracing and recording individual sheep using ear tags and paper records, make a manual system of sheep tracing impractical. The UK has established interim systems of recording movements between flocks using ear tags, but not individual identification. The UK will continue to participate fully in discussions in the EU.

Independent and open scientific advice

Government veterinary advice was provided by the CVO. In developing this advice, the CVO drew on the knowledge and expertise of staff in the SVS, at the IAH in Pirbright (the World Reference Laboratory for FMD) and the VLA, including veterinary epidemiologists. As well as expertise from other Government agencies and, in line with recommendations in the Phillips Inquiry into BSE (2), effort was particularly directed to ensuring that this included advice from independent veterinarians and scientists. Regular weekly meetings were held with senior representatives of the veterinary profession at which the disease and control methods were discussed.

To allow the development of independent scientific advice and greater openness of scientific data, the Government Chief Scientific Adviser rapidly established an FMD science group. This included three teams of university-based epidemiological modellers and one from the VLA, as well as Government veterinary epidemiologists, veterinary experts, serologists, practising veterinarians and logisticians. Advice from the discussions of this group played a role in the development of culling policies, slaughter targets and other policies to control the epidemic. Advice from the CVO and the FMD science group was made public wherever possible.

Keeping the countryside open

The dissemination of FMD before the disease was reported meant the necessary eradication measures would affect a wide geographical area. DEFRA believes that the eradication policy was correct, but recognises that managing the effect on the wider community of disease control, slaughter, disposal and biosecurity measures is a major exercise and needs to be included in future contingency planning. A balance must be

struck between the twin imperatives of disease control and minimising the consequences on the rural economy.

In the early weeks of the outbreak, pressure from farmers, the media and overseas governments favoured a restrictive approach to countryside access. However, this did not provide sufficient grounds for closures which only occurred once objective, veterinary justification for the action was demonstrated. In the light of increasing knowledge about the disease, the justification was refined after further veterinary risk assessments were performed. As the impact of closures on rural tourist businesses became apparent, the balance of public and media opinion shifted, although a significant part of the population continued to take the view that any precaution that might reduce disease spread was justified.

In particular, consideration should be given to the following:

- the importance of basing decisions on published veterinary risk assessments as occurred in 2001, and assessment of the likely impact of disease control measures on the non-farming economy
- the importance of explaining clearly to the public, and national and international media, the basis on which decisions have been taken, including an explanation of the risks that non-farming countryside users may pose to disease control
- the need to convey tailored messages to different target audiences
- the difficulty of qualifying a precautionary message and relaxing controls once more information and advice is available.

However, responses need to remain flexible as the characteristics of an outbreak become more defined and for all who are affected by the outbreak to be aware that the overriding principle is the control and eradication of the disease.

Engagement with other countries

European Union

One of the main lessons that was appreciated and acted upon very early in the epidemic was the importance of engaging fully and openly with other EU member states, the EC and the OIE. The EC and the OIE were kept fully informed of progress in controlling the epidemic. Such active participation enabled decisions to be taken promptly, which were of direct assistance during the outbreak. This allowed for rapid and highly targeted responses by those other member states to which animals from the UK had moved.

The EC and member states were willing to aid in the eradication programme and to adopt decisions at short notice,

such as permitting emergency vaccination of cattle in Cumbria and Devon, although in the event, this option was not used.

Keeping the EC and member states fully informed of progress with disease control contributed to the timely lifting of the various export bans that were imposed on the UK at the commencement of the epidemic and restoration of the FMD-free status of the UK early in 2002.

Engagement with other member states helped secure rapid veterinary assistance from the EU as well as from the United States of America, Canada and Australia.

Impact of the disease internationally

Media images of the control of FMD had severe impacts overseas. Staff in British embassies overseas were involved in providing information about the true situation in the UK. Many issues were addressed, including the following:

- human health implications of FMD
- incorrect reports of food shortages in the UK
- the possibility that disease could be transported to other countries.

There was a need to address concerns that all possible measures were being taken to control the outbreak, while not implying that the countryside was closed. Many overseas activities were affected for which timely and accurate advice was provided from DEFRA to support efforts of the British embassies to counter the damaging effect of misconceptions about FMD. Such activities included the following:

- a) military training (Canada)
- b) school exchanges (Europe)
- c) exports of other products from non-FMD susceptible animals:
 - fish (to Russia)
 - grain (to North Africa).

Actions taken

Swill feeding of pigs banned from May 2001

From the commencement of the epidemic, there was speculation that FMD had entered the country via infected or contaminated meat or meat products. The UK banned the feeding of unprocessed waste to livestock in 1973, but a permanent ban on the feeding of all waste to livestock, whether processed or not, was introduced early in the epidemic. On 3 May 2001, legislation on the following came into effect:

- ban on the production and feeding of swill from catering waste which contained meat or meat products or products that had been in contact with meat or meat products

- ban on the use of poultry slaughterhouse waste and fish waste in swill

- maintenance of a ban on the access to livestock of any imported catering waste.

Controls on the imports of meat and meat products

The FMD epidemic has drawn public attention to the potential for exotic diseases to be imported. The Government had already implemented measures but is taking further steps to tighten these controls.

Imports of meat into any EU state from a country outside the EU are required to conform to EU rules on conditions and veterinary certification. In addition, incoming meat consignments must be presented at a border inspection post (BIP) where all are subject to documentary and identity checks and at least 20% undergo physical checks. This is audited by the Food and Veterinary Office of the EC and monitored by DEFRA.

Cross-government consideration of the problem of illegally imported animal products is being led by DEFRA. Port Health Authorities are being encouraged to exercise greater vigilance in all imported consignments checks. The Food Standards Agency is responsible for public health aspects of such imports and for imports of other food products. Particular attention is being paid to retail outlets where illegally imported products may be sold.

Illegal imports of meat can be made by travellers bringing small quantities in their luggage or traders smuggling meat in containers supposedly holding other products. Detection in both these cases is very difficult but depends on spot checks by Port Health and Customs Officers with consideration being given to the use of detector dogs and X-ray machines.

Action already taken by the Government against this smuggling activity includes the following:

- increased public awareness using posters at the principal airports and ports, with information provided by UK embassies, airlines and travel agents to travellers before departure to the UK. Action for in-flight initiatives is also being taken forward, e.g. video, public announcements
- increased enforcement powers
- improved intelligence gathering and sharing of information
- a risk assessment has been commissioned to analyse the probability of illegal imports of animal products, the probability of such imports being infected with FMD or other List A notifiable diseases, and the probability that any infected illegal imports will reach susceptible livestock. This information will be used to better target enforcement resources.

Biosecurity controls

Control of FMD has always depended on the imposition of, and compliance with, tight rules on biosecurity. This requires a partnership between Government and the farming industry to make such advice and guidance widely available at the earliest opportunity and to react in a responsible and resolute way.

During this epidemic of FMD, the importance of maintaining biosecurity became a major issue with many cases of disease caused by inadequate compliance. Strict restrictions were imposed in certain areas where the level of biosecurity was contributing to disease spread. Within these restricted infected areas, very high standards of biosecurity were required of all livestock keepers and of milk tankers, grain lorries and all vehicles visiting farms. These strict controls proved effective and, subject to veterinary assessment, would be implemented immediately in any recrudescence or new outbreak.

The Government has demonstrated commitment to emphasising that adequate disease control can only be maintained by implementing sound biosecurity measures. This is a lesson that must be learnt by the entire farming community if outbreaks of disease are to be prevented, controlled and eradicated.

Conclusions

The FMD epidemic in the UK in 2001 occurred almost entirely in sheep in a country that had been FMD-free, without vaccination for a considerable period of time and where the

industry was of a highly complex nature involving dealers, markets and movements.

Existing instructions and plans were initially effective in dealing with cases as they developed, but the scale of the epidemic rapidly overwhelmed available resources.

Many lessons were learned during the epidemic and implemented immediately.

Further lessons learned with hindsight will continue to be assessed and implemented.

Future disease control methods will continue to develop, incorporating all the knowledge that becomes available during outbreaks and with the benefit of hindsight. Contingency plans both in the UK and elsewhere are being reviewed in the light of this experience.

The difficulties faced by the UK were highlighted in a report by a European Commissioner (5). Despite the best possible preparations, events may still occur on a scale that no-one could have envisaged, the response to which becomes a task of monumental proportions.

Lessons will, and must, continue to be learned. Perhaps the most important is that disease is unpredictable and whilst previous experiences and outbreaks may serve as a guide for actions in the future, no two outbreaks are the same and responses to them must remain flexible and adaptable. ■

Contrôle de la fièvre aphteuse : les enseignements de l'épizootie survenue en Grande-Bretagne en 2001

J.M. Scudamore & D.M. Harris

Résumé

En 2001, une épizootie de fièvre aphteuse sans précédent frappait la Grande-Bretagne. Elle s'est caractérisée par la propagation généralisée du virus aux ovins, en raison de la présence non signalée de l'infection, pendant au moins trois semaines avant la détection du premier cas. Conformément aux plans d'urgence, les procédures existantes ont permis de maîtriser rapidement la maladie dans les nombreuses régions où des foyers avaient été observés. Ailleurs, la maladie a pris une telle ampleur et s'est propagée à une telle vitesse que les services vétérinaires ont dû bénéficier d'un solide appui administratif civil et militaire pour mener à bien leurs opérations sur le terrain.

En juin 2002, date à laquelle fut rédigé cet article, les autorités britanniques avaient déjà tiré un certain nombre d'enseignements essentiels. Les résultats des enquêtes en cours viendront certainement enrichir cette expérience et expliquer comment il conviendra désormais de gérer une épizootie de cette nature et de cette importance. Les premières leçons soulignent d'ores et déjà la nécessité d'améliorer les plans d'urgence, d'apprécier plus globalement l'impact de

l'épizootie sur les entreprises et les collectivités rurales, de s'interroger sur un éventuel recours à une vaccination d'urgence, de déterminer la capacité de réaliser les analyses sérologiques et, enfin, d'améliorer l'identification et le contrôle des animaux et de leurs déplacements, l'élimination des cadavres, les communications, ainsi que la gestion des données et de l'information.

Les auteurs présentent ces premiers enseignements, qui constituent le fondement de la position officielle exprimée lors des enquêtes. D'autres leçons seront tirées en fonction des résultats de ces enquêtes.

Mots-clés

Communication – Épizootie – Fièvre aphteuse – Grande-Bretagne – Gestion des urgences – Prophylaxie – Royaume-Uni.



Control de la fiebre aftosa: lecciones de la experiencia del brote de 2001 en Gran Bretaña

J.M. Scudamore & D.M. Harris

Resumen

En el año 2001, Gran Bretaña conoció una epidemia de fiebre aftosa de una magnitud sin precedentes. Una de sus características fue la extensión generalizada de la enfermedad a los ovinos, debida al lapso de al menos tres semanas que transcurrió entre la presencia de la enfermedad y la detección y notificación del primer caso. Conforme a lo esperado, los protocolos de los planes para situaciones imprevistas sirvieron para atajar con rapidez la enfermedad en muchas de las zonas del país donde se habían comunicado brotes. Pero en los demás lugares los servicios veterinarios no dieron abasto ante la magnitud y velocidad de propagación de la epidemia, lo que hizo necesario un nutrido apoyo militar y administrativo para poder realizar las labores operativas.

En la fecha de redacción del presente artículo (junio de 2002), el Gobierno del Reino Unido ya ha extraído una serie de conclusiones fundamentales de esa experiencia y seguirá haciéndolo apoyándose en las investigaciones ulteriores para dilucidar el mejor modo de hacer frente en el futuro a un eventual brote de tan inusitadas dimensiones y singular naturaleza. Las conclusiones extraídas hasta ahora apuntan a la necesidad de mejorar los planes de emergencia, lograr un seguimiento más amplio en las explotaciones y comunidades rurales, reconsiderar el posible uso de vacunaciones de emergencia, disponer de mayor capacidad serológica y mejorar la identificación de los animales, el control de sus movimientos, la eliminación de sus cadáveres, las comunicaciones, el tratamiento de datos y la gestión de la información.

Los autores exponen las primeras enseñanzas extraídas de la epidemia, que sentaron las bases de las respuestas oficiales a las peticiones de investigación. Es de prever que los resultados de esas encuestas sigan deparando lecciones de interés.

Palabras clave

Comunicación – Control – Epidemias – Fiebre aftosa – Gestión de emergencias – Gran Bretaña – Reino Unido.



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