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# Exotic Animal Disease Risk Pathways & Countermeasures

## Final Report

October 2009

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## Contents

<b>1</b>	<b>Executive Summary</b>	<b>5</b>
1.1	Summary of Findings	
1.2	Overview of Recommendations	
1.3	Next Steps	
<b>2</b>	<b>Introduction</b>	<b>11</b>
2.1	Background to the Project	
2.2	Purpose of the Report	
2.3	The Project Approach	
2.4	Which Exotic Disease are in Scope?	
2.5	What is the Impact of a Particular Disease?	
2.6	Exclusions	
<b>3</b>	<b>Review and Classification of Risk Pathways</b>	<b>16</b>
3.1	What are Risk Pathways?	
3.2	Comparative Ranking of Risk Pathways	
3.3	Which Pathways Present the Highest Level of Background Risk?	
3.4	Why do these Pathways Present the Highest Risk?	
3.5	Which Exotic Diseases can Exploit the Pathways of Highest Risk?	
<b>4</b>	<b>Review of Existing Controls and the Delivery Landscape</b>	<b>53</b>
4.1	The Delivery Partners	
4.2	Roles and Responsibilities	
4.3	Existing Controls	
4.4	Levels of Enforcement and Compliance	
4.5	Controlling the Pathways of Highest Risk	

<b>5</b>	<b>Review of our Resilience in Controlling and Mitigating Exotic Diseases</b>	<b>73</b>
5.1	What is Working?	
5.2	Our Resilience	
5.3	Challenging our Resilience	
5.4	Strengthening our Resilience	
<b>6</b>	<b>Key Findings and Recommendations</b>	<b>82</b>
6.1	Assessing our Resilience	
<b>7</b>	<b>Initial Analysis</b>	<b>94</b>
7.1	End of Stage 1: Priority Pathways	
<b>8</b>	<b>Review of the Priority Pathways</b>	<b>96</b>
8.1	Collecting the Evidence, Understanding the Risk and Investigating Existing Controls	
<b>9</b>	<b>Final Recommendations</b>	<b>107</b>
9.1	Recommendations: Taking Forward the Priority Pathways	
9.2	Recommendations: Other Challenges	
9.3	Recommendations: Further Actions	
<b>10</b>	<b>Implementation and Future Reviews</b>	<b>113</b>
10.1	Implementation Plan	
10.2	Future Reviews	

<b>11 References</b>	<b>117</b>
<b>Annex 1 – Notifiable Exotic Diseases</b>	<b>120</b>
<b>Annex 2 – List of Internal Experts Consulted</b>	<b>121</b>
<b>Annex 3 – Mythical Disease Scenarios</b>	<b>122</b>
<b>Annex 4 – Risk Assessment Layouts</b>	<b>124</b>
<b>Annex 5 – List of Attendees at Delivery Partners Workshop</b>	<b>125</b>
<b>Annex 6 – List of Disease Specific Legislation</b>	<b>126</b>
<b>Annex 7 – List of Tables</b>	<b>128</b>
<b>Annex 8 – List of Figures</b>	<b>129</b>

# 1 Executive Summary

## Introduction

The Exotic Disease Risk Pathways and Countermeasures Project was commissioned by Defra's Exotic Disease Policy Programme, to conduct a high level review of the ways in which an exotic disease agent could cause an animal disease outbreak in Great Britain and to assess our resilience to an exotic disease incursion. The aim of the project is to identify the high likelihood disease pathways, bringing to light those which are becoming more significant, and to review the level of risk management already being applied to ensure that resources are allocated appropriately.

## Risks and vulnerabilities – why are we concerned

Risk for the project is the threat of an exotic disease entering Great Britain to cause an animal disease outbreak. In the interim report the focus is on the probability of the threat occurring rather than the impact of a particular animal disease, or the way by which it enters and spreads around GB.

From our experience of animal disease outbreaks we know that the consequences can have widespread adverse implications beyond the obvious and direct effects on animal health, welfare, trade and productivity. Outbreaks and the measures to control them can carry wide and costly consequences for public health, the economy and the environment. In comparing the threat of an animal disease incursion the impact of the resulting outbreak has been treated as the same.

Looking at recent history (see chapter 3, table 3 for details of exotic animal disease outbreaks) the threat of an exotic disease outbreak occurring is significant, so it is sensible for Defra to routinely review existing risk management priorities and measures, to identify where we may be vulnerable. Here a vulnerability refers to a part of our risk management chain which could be easily exploited by an exotic disease to cause an outbreak, either by acting as an entry point or allowing the disease to spread. To identify vulnerabilities the project has looked at where there are gaps in our understanding and knowledge of the threats, weaknesses in existing risk controls and their enforcement, and non-compliance. All of which can be seen as threatening our resilience to reduce and manage the risk of an exotic disease outbreak.

Inevitably when judging the likelihood of an animal disease outbreak there is a degree of uncertainty and there will be an acceptable level of risk that senior managers will wish to tolerate based on our ability to influence, or control the threat.

## Our approach

The report pulls together and distils the evidence gathered from interviews with experts, the outputs of workshops with internal experts and delivery partners, as well as desk-based research to understand the background risk and map existing countermeasures. A total of 19 interviews were carried out at the start of the project and key experts were asked to identify what they saw as potential threats to the control and mitigation of exotic animal disease. This enabled the team to form a high level view of the areas of concern and informed the approach to the two workshops.

At the first workshop internal experts (from Defra, Veterinary Laboratory Agency, and Animal Health) were asked to rehearse potential risk scenarios. Using three 'mythical' exotic diseases participants identified the pathways which presented the highest likelihood of being

exploited by the disease, and thus the most probable risk. The second workshop focused on these pathways and delivery partners were asked to identify the strengths and weaknesses of existing countermeasures. Participants identified threats to our resilience along these pathways and suggested actions to address, or reduce the threat.

To build upon the qualitative evidence from the interviews and workshops, information has been gathered to form a picture of the level of activity along the pathways, i.e. the number of livestock consignments imported, or the number of animal movements. A desk-based review of the existing controls and the delivery landscape was carried out to identify the legislation in place and to gather formal information on levels of enforcement and compliance.

The workshops, interviews and research provide a snapshot of the current controls and our management of risk pathways which was used to carry out a high level assessment of our resilience along the pathways. This assessment identified four priority pathways for the project to consider in its final phase. From this assessment a number of recommendations were made to enable us to better understand our resilience to the threat of an exotic disease exploiting these pathways. In particular to:

- Increase our confidence in the evidence base
- Increase our understanding of the countermeasures – their effectiveness and enforcement
- Better understand behaviours and levels of compliance
- Assess and/or re-assess the risk to better inform our priorities

Finally the project makes a series of recommendations. The first set are aimed at addressing the findings from the work undertaken by the project on the priority pathways. The second are other challenges identified that do not fall under these priority pathways but remain significant issues for others to take forward. Finally, the third are further actions to validate and build upon this project and its findings, including commissioning and the methodology for future reviews.

## **1.1 Summary of findings**

In this review we have focused on what internal experts have recognised as the 11 most probable risk pathways by which an exotic disease could enter Britain and spread to cause an outbreak. Chapter 3 outlines how we identified and compared the pathways to establish this focus, and the level of risk that the pathways pose.

We found that the pathways identified as high probability already fall under existing controls and measures to manage and mitigate the risk of an exotic disease incursion. Chapter 4 outlines these measures and our confidence in the enforcement of the controls, and our feeling for the level of compliance. Despite measures being in place there was a general lack of information and data for some of the pathways, particularly in terms of the effectiveness of enforcement and the level of compliance, and a number of assumptions had to be made.

In assessing the resilience of the 11 risk pathways to the risk of an exotic disease incursion we concluded that there were four priority pathways for the final stages of the project to focus on. These were:

- Imports of laboratory material

- Livestock transport vehicles (both internal movements and entering GB)
- Livestock locations and movements around GB
- Contact between livestock and wildlife

## 1.2 Overview of recommendations

This report makes a number of recommendations (a full discussion can be found in Chapter 9).

For each of the four priority pathways we have identified a number of recommended actions to take build upon the findings of this project where appropriate and to improve our evidence base, with the aim of building the resilience of the pathway:

Pathway	Recommendation	Owner
Imports of laboratory materials	<p><b>R1</b> The Defra project reviewing the authorisation system for imports of animal products and pathogens which are intended for research or diagnostic purposes, should consider:</p> <ul style="list-style-type: none"> <li>– Involving the ACIES Customs Committee as part of their stakeholder consultation exercise</li> <li>– Raise awareness amongst potential importers about post office regulations and licensing requirements</li> <li>– Including conditions on the licence applications that importers must abide by transportation and packaging requirements</li> <li>– Research organisations have a nominated individual to promote awareness and compliance with import rules and regulations</li> </ul>	Veterinary Science Team
	<p><b>R2</b> Defra to consider with UKBA and others, as part of the whole remit of the revised Service Level Agreement, the possibility of carrying out a targeting exercise at a postal/parcel depot to provide better evidence on the number of illegal imports of products of animal origin, including those intended for research or diagnostic purposes</p>	Veterinary Science Team
	<p><b>R3</b> Defra works with HSE to ensure that transportation is one of the issues considered in HSE's future benchmarking exercise for laboratory inspections</p>	Exotic Disease Policy Programme
Livestock transport vehicles	<p><b>R4</b> Defra works with LACORS to:</p> <ul style="list-style-type: none"> <li>– identify intelligence to assist local authorities in targeting risk; and</li> <li>– drive the development of a guidance note for local authorities in</li> </ul>	Veterinary Science Team / Exotic Disease Policy Programme



	collaboration with Animal Health and the Meat Hygiene Service, highlighting the objectives of the C&D controls and the powers enforcement officers have under the existing Order	
Livestock Movements around GB	<b>R5</b> The CPH Programme in conjunction with the Exotic Disease Policy Programme, use the outputs from the exotic disease modelling work to characterise the risk presented by SOAs and inform their analysis of the actions which need to be taken to mitigate this risk	Exotic Disease Policy Programme
	<b>R6</b> The Defra project to review the Animal Gatherings Order 2006 delivers a wider review of biosecurity at gatherings and introduces a new regime in time for the 2010 show season	Exotic Disease Policy Programme
	<b>R7</b> Commission studies to further understand certain livestock sectors e.g. pig, goat and camelid industries	Veterinary Science Team
Contact between livestock & wildlife	<b>R8</b> Service Level Agreements are developed with wildlife delivery agencies that are currently are relied upon for wildlife field visits and advice	Veterinary Science Team
	<b>R9</b> Gather population data and surveillance information to improve our evidence of feral boar distribution, to better target surveillance and to inform contingency planning	Veterinary Science Team
	<b>R10</b> Evidence and population data on deer to assess the risks they pose as carriers and potential cause of the spread of livestock disease, to support a veterinary risk assessment and contingency planning	Veterinary Science Team

In addition to these key pathways, there are a number of issues raised under other pathways or which cut across a number of pathways that deserve some further consideration. We recommend:

<b>Recommendation</b>	<b>Owner</b>
<b>R11</b> Studies are commissioned to gather fit for purpose equine population data and conduct necessary network analysis to underpin the development of disease control strategies.	Exotic Disease Policy Programme
<b>R12</b> Further investigation of the risks posed by certain farming practices, such as the use of temporary/ casual workforce, or “flying herds”. In particular the level of understanding amongst farmers of the associated risks of these practices and the steps that they are taking to strengthen their resilience and raise awareness of biosecurity guidance with their workers. As well as the general level of compliance and understanding of on-	Exotic Disease Policy Programme

farm biosecurity, particular for farms where the threat of contact between susceptible wildlife and livestock is high.	
<b>R13</b> A project to update and co-ordinate the advice and guidance currently being given on the Defra website on detecting exotic animal diseases and the process for reporting suspicions. This will require close collaboration with Animal Health and other delivery partners, such as the British Veterinary Association and industry, to ensure consistency of information and appropriate signposting. The project should also consider the potential of other communication tools to support the website refresh.	Exotic Disease Policy Programme / Veterinary Science Team

Two of the main themes that came out of our workshop with delivery partners were the need for:

- A clear, enforceable and proportionate legislative framework
- Good communication between delivery partners and joined-up working

We welcome the proposals set out in Animal Health’s draft Enforcement Strategy ‘to work with policy customers and enforcement partners to review the functioning of the regulatory framework to see the ways in which it can be improved’ and the aim on ‘Partnership working and engagement’. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R14</b> The Exotic Disease Policy Programme supports Animal Health in its review, feeding in expertise and concerns, monitoring progress and taking forward solutions. In particular that concerns on the complexity of feed controls are investigated and clarified. That the programme separately considers with Defra Legal what guidance is needed to ensure that amendments to existing regulations and the drafting of new regulations incorporates these solutions.	Exotic Disease Policy Programme
<b>R15</b> Defra’s Food & Farming Group Agency Relationship Team continue to work with delivery partners to drive collaborative working, the sharing of information at an operational level and influence outcomes.	Food & Farming Group Agency Relationship Team

This project provides a high level review of the resilience of our risk pathways to the threat of an exotic disease outbreak. Given the short-term nature of the project there are a number of activities which could be taken forward separately to strengthen and build upon the findings of the report, and aid any review of risk in the future. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R16</b> Defra works with its range of delivery partners to improve the level of intelligence capture and feed back to the Department, so there is a more formal evidence base with which to develop or enhance policies, and to help delivery partners prioritise enforcement activities on the basis of risk. This is consistent with the ‘making the best use of data’ aim set out in Animal Health’s draft Enforcement Strategy.	Food & Farming Group Agency Relationship Team
<b>R17</b> Completion of disease profiles continues to be a priority for	Veterinary

	Defra, and the remaining profiles on exotic diseases are completed and validated as soon as practicable to enable an accurate and objective disease risk ranking to be carried out. This will enable a validation of the expert opinion that has helped identify the diseases in scope. A more accurate disease ranking will enable us to identify with more accuracy, the risk pathways of most concern.	Science Team
<b>R18</b>	The Exotic Disease Policy Programme prioritises resources on management of high probability pathways identified by our experts in the short term, and monitors and reports progress against the recommendations in this report.	Exotic Disease Policy Programme
<b>R19</b>	That this report provides a foundation for the regular review of the risk pathways at appropriate intervals, taking into account disease profile updates.	Veterinary Science Team
<b>R20</b>	That a small project is commissioned to review the case history of outbreaks in Europe over the last 5 years and compare this to our ranking of high likelihood risk pathways produced by expert opinion.	Veterinary Science Team
<b>R21</b>	That a small project to scope a possible analysis of risks from low/medium probability risk pathways is commissioned to identify and assess potential high impact scenarios (if a sequence of low probability events occur), taking into account current levels of risk management. For example, the risk posed by international catering and galley waste both from aircraft and ships.	Exotic Disease Policy Programme

### 1.3 Next Steps

With the closure of this project there is a risk that the actions set out in the recommendations above could lose momentum. To avoid this happening the project team will work with the identified owners to develop an implementation plan. This implementation plan will be used as a tool for monitoring and reporting progress on the recommendations to the Exotic Disease Policy Programme Board.

It is also proposed that a risk pathways and vulnerabilities summit is held in Spring 2010 to review and evaluate this progress and main focus on delivering the recommendations. Chapter 10 sets out in more detail plans for implementation and future reviews.

## 2 Introduction

### 2.1 Background to the Project

This project was commissioned by the Exotic Disease Policy Programme. The aim of the project is to conduct a broad review of the ways (risk pathways) in which a notifiable, exotic disease agent could cause an outbreak of animal disease in Great Britain (GB) and identify any areas where:

- we may be vulnerable and need to do some work to address the areas of concern;
- we really don't know whether we are vulnerable or not and need to do something to gather an appropriate evidence base;
- we are potentially vulnerable but have addressed those risks adequately or effectively through fit for purpose legal provisions that are being adequately enforced.

The review will identify any new disease pathways which are becoming more significant in our overall risk profile, and will assess the level of risk management already being applied to ensure that resources are allocated appropriately. Disease risk pathways and their management do not remain static, and may change with time. Conducting on-going reviews to ensure continued understanding of the risks and vulnerabilities is good practice in risk management and will enable Defra to deploy resources to best effect in managing disease threats.

The project was overseen and quality assured by a small project board which included the Chief Veterinary Officer, Defra Risk Co-ordinator and Deputy Director for Exotic Disease Policy.

### 2.2 Purpose of the Report

This report presents a wide range of cross disease data and examines qualitative evidence gathered from interviews and workshops with experts, to identify the key issues and recommendations for further work to strengthen resilience against the threat of an exotic disease incursion.

### 2.3 Project Approach

The report pulls together and distils the evidence gathered from interviews with experts, the outputs of workshops with internal experts and delivery partners, as well as desk-based research to understand the background risk and map existing countermeasures.

#### 2.3.1 Interviews

In the interviews key experts were asked to highlight what they saw as significant challenges in controlling and mitigating exotic disease animal disease. This provided a high level view of the areas of concern and informed the approach for the two workshops. (Full list of interviewees at Annex 2) The challenges identified are captured in table 19, section 5.3.

#### 2.3.2 Workshop 1: identifying pathways of highest risk

The first workshop was held on 21 October 2008 and internal experts (from Defra, Veterinary Laboratory Agency, and Animal Health) were asked to rehearse potential risk scenarios and

identify pathways which present the highest risk, or 'unknown' levels of risk. Participants were divided into three groups and given a different mythical disease profile. Each group identified the high risk means by which the disease could be carried to and across the GB border, and then the high risk ways in which the disease could then be transmitted from the border to our susceptible livestock population. These outputs were assessed to form the pathways of highest risk which then provided the focus for the second workshop with delivery partners. (Full list of participants at Annex 2) Section 3.2 outlines the methodology taken for the workshop and section 3.3 highlights the outcome.

### **2.3.3 Workshop 2: assessing controls and emerging challenges**

The second workshop was held on 26 November 2008 and delivery partners were asked to identify the strengths and weaknesses of existing exotic disease prevention and detection controls. Participants then split into two groups, one focusing on import/border controls and the other on internal spread controls, to look at the high risk pathways and where controls may be vulnerable. The groups identified challenges, explored why and suggested actions to address or reduce the magnitude of the vulnerability. (Full list of participants at Annex 3) Discussion of the themes and issues is set out in Chapter 5, whilst table 21 in section 6.1 maps the challenges against the high probability pathways.

### **2.3.4 Desk-based research**

To build upon the qualitative evidence from the interviews and workshops, information has been gathered to form a picture of the level of activity along the pathways, i.e. the number of livestock consignments imported, or the number of animal movements. A desk-based review of the existing controls and the delivery landscape was carried out to identify the legislation in place and to gather formal information on levels of enforcement and compliance.

In gathering evidence to define the issue the project team has worked in collaboration with delivery partners, including

- Animal Health (AH)
- Trading Standards & Local Authorities
- Association of Port Health Authorities (APHA)
- UK Border Agency (UKBA)
- Health and Safety Executive (HSE)
- Meat Hygiene Service (MHS)
- Veterinary Laboratories Agency (VLA), particularly Species Groups
- *Health Protection Agency (HPA)*

and other teams and programmes within Defra which have critical expertise and knowledge about diseases risks and pathways from overseas, imports and enforcement at the border and the GB livestock industry, veterinary surveillance, epidemiology and veterinary risk assessments, for example:

- The Livestock and Livestock Products Hub (John Bourne)
- International Animal Health (Nick Coulson)
- The Veterinary Surveillance Strategy Programme (Ruth Lysons)
- The National Epidemiology Group (Jane Gibbens)
- Animal Health and Welfare Evidence Base (Richard Drummond)

### 2.3.5 Resilience assessment and recommendations

The workshops, interviews and research provide a snapshot of the current controls and our management of risk pathways which was used to carry out a high level assessment of our resilience along the pathways. This assessment identified four priority pathways for the project to consider in its final phase. From this assessment a number of recommendations were made to enable us to better understand our resilience to the threat of an exotic disease exploiting these pathways. In particular to:

- Increase our confidence in the evidence base
- Increase our understanding of the countermeasures – their effectiveness and enforcement
- Better understand behaviours and levels of compliance
- Assess and/or re-assess the risk to better inform our priorities

Finally the project makes a series of recommendations. The first set are aimed at addressing the findings from the work undertaken by the project on the priority pathways. The second are other challenges identified that do not fall under these priority pathways but remain significant issues for others to take forward. Finally, the third are further actions to validate and build upon this project and its findings, including commissioning and the methodology for future reviews.

In investigating the threat posed by the risk pathways and the controls in place various sources of data have been used, Chapter 11 provides the details of the material to which this project refers. Existing controls and the regulatory framework were also discussed and mapped with Defra’s Legal team.

## 2.4 Which exotic diseases are in scope?

For the purposes of this project, a notifiable exotic disease was originally defined as a disease named in section 88 of the Animal Health Act 1981 or an Order made under that Act, which is not usually present in GB (see Annex 1 for a list of 39 notifiable diseases and their current occurrence).

However during discussions with internal experts as part of this scoping study, this initial statement of scope, has been revised down to the 20 exotic diseases listed in table 1, which are deemed to be of greatest importance, in terms of economic value or risk of disease transmission<sup>1</sup>.

**Table 1:** List of notifiable exotic diseases in scope

Notifiable Disease	Species Affected
African Horse Sickness	Horses
African Swine Fever	Pigs
Aujeszky’s	Pigs and other mammals
Avian Influenza (Bird flu)	Poultry
Bluetongue	All ruminants and camelids
Brucellosis (Brucella abortus)	Cattle
Brucellosis (Brucella melitensis)	Sheep and Goats
Classical Swine Fever	Pigs
Equine Viral Encephalomyelitis	Horses

<sup>1</sup> List of exotic diseases in scope was originally selected by experts in Global Animal Health team and reviewed by Defra Epidemiologists

Equine Infectious Anaemia	Horses
Foot and Mouth Disease	Cattle, sheep, pigs and other cloven hoofed animals
Glanders	Horses
Newcastle Disease	Poultry
Pest des Petits Ruminants	Sheep and Goats
Rabies	Dogs and other mammals
Rift Valley Fever	Cattle, Sheep and Goats
Sheep & Goat pox	Sheep
Swine Vesicular Disease	Pigs
Vesicular Stomatitis	Cattle, pigs and horses
West Nile Virus	Horses

## 2.5 What is the impact of a particular disease?

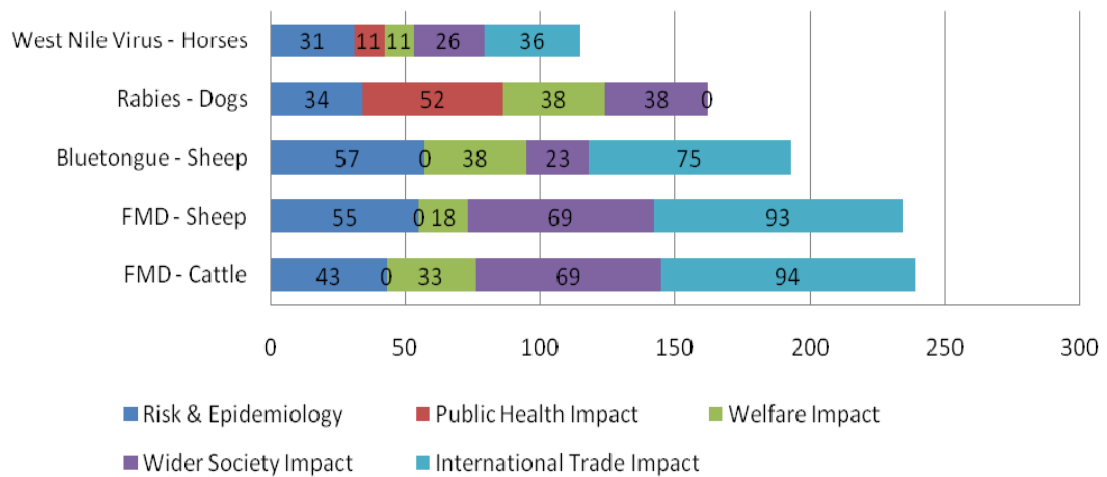
Quantifying the importance or level of impact associated with an outbreak of a particular disease is extremely complex and beyond the scope of this project. However, a disease prioritisation tool has been designed and is being built as part of the implementation of the GB Animal Health and Welfare Strategy and the Veterinary Surveillance Strategy. The tool provides an accessible evidence base to inform decisions on relative resource allocation for animal health issues. A 'profile' for each disease captures objective, peer-reviewed evidence from which the tool calculates, for each disease considered, a score for the impact on public health, international trade, animal welfare and 'wider society' (rural economy, biodiversity, environment), derived from 40 key criteria. The evidence base is defined, standardised and weighted, so the scores for the diseases assessed are directly comparable (see table 2).

The tool compares issues in the context of current policies and disease distribution, i.e. the *status quo*, and the outputs from the tool include a visual summary to show comparative ranking (see figure 2 for an example). A full, validated list of exotic diseases and their initial impact scores is expected to be available later in 2009.

**Table 2:** Description of the summary scores for each category in the disease prioritisation tool

<b>Public Health Impact</b>	How bad human disease might be (weighting - 44%)
	Human attributable risk or exposure + extent GB based (38%)
	Uncertainty as to public health significance (13%)
	Costs of human disease (5%)
<b>Animal Welfare Impact</b>	Number of individual animals affected (30%)
	Welfare impact: Five Freedoms + duration (53%)
	Welfare impact of control measures (11%)
	Extent of excess suffering (disease/controls) (6%)
<b>Wider Society Impact</b>	Risk of unexpected government costs (29%)
	Wider community social & economic impact (29%)
	Environmental impact (29%)
	Producer economic impact (14%)
<b>International Trade Impact</b>	Government effort (40%)
	Legal risk (30%)
	(Potential) extent of impact on industry sector (28%)
<b>Risk and Epidemiology</b>	Likelihood of an unaffected holding becoming affected (44%)
	(Potential) rate of spread (12%)
	Extent to which the keeper or government can control (44%)

**Figure 1:** Example summary presentation of comparative normalised scores for the impact of 4 exotic diseases (chart is based on example data at December 2008, yet to be validated and published)



## 2.6 Exclusions

The project has not considered risk pathways relevant to Northern Ireland, or endemic and new and emerging diseases. However, it is recognised that this project may identify some threats to our resilience which also increase the likelihood of the evolution or emergence of new infectious disease agents or a change in the prevalence of existing agents.



## 3 Review and Classification of Risk Pathways

### 3.1 What are risk pathways?

Exotic diseases, by their very definition, are not usually present in GB, but recent history (see table 3) shows that outbreaks do occur in GB with moderate frequency, and with increasing globalisation, although it is difficult to predict, it seems likely that this pattern will continue.

**Table 3:** Exotic animal disease outbreaks in GB 2000-08

August 2000	Swine Fever in Pigs in East Anglia, England
February 2001	Foot and Mouth Outbreak, Great Britain
July 2005	Newcastle Disease in Pheasants, Surrey, England
March 2006	Highly pathogenic H5N1 Avian Influenza in a wild swan in Cellardyke, Scotland
April 2006	Low pathogenic H7N3 Avian Influenza outbreak in poultry near Dereham, Norfolk
October 2006	Newcastle Disease in poultry in East Lothian, Scotland
February 2006	Highly pathogenic H5N1 Avian Influenza outbreak in poultry in Holton, Suffolk
May 2007	Low pathogenic H7N3 Avian Influenza outbreak in poultry in Conwy, Wales
August 2007	Foot and Mouth Outbreak, Surrey, England
September 2007	Bluetongue, first case in East Anglia
November 2007	Highly pathogenic H5N1 Avian Influenza in poultry in Suffolk
January 2008	Highly pathogenic H5N1 Avian Influenza in wild swans in Dorset
June 2008	Highly pathogenic H5N7 Avian Influenza in poultry in Banbury, Oxfordshire

Animal diseases which are exotic to GB are normally present in other parts of the world and Defra monitors their occurrence (see figure 2) in order to respond to threats to animal health and changes in the relative importance of some risk pathways. International disease monitoring reports and worldwide outbreak assessments are published routinely on the Defra website.

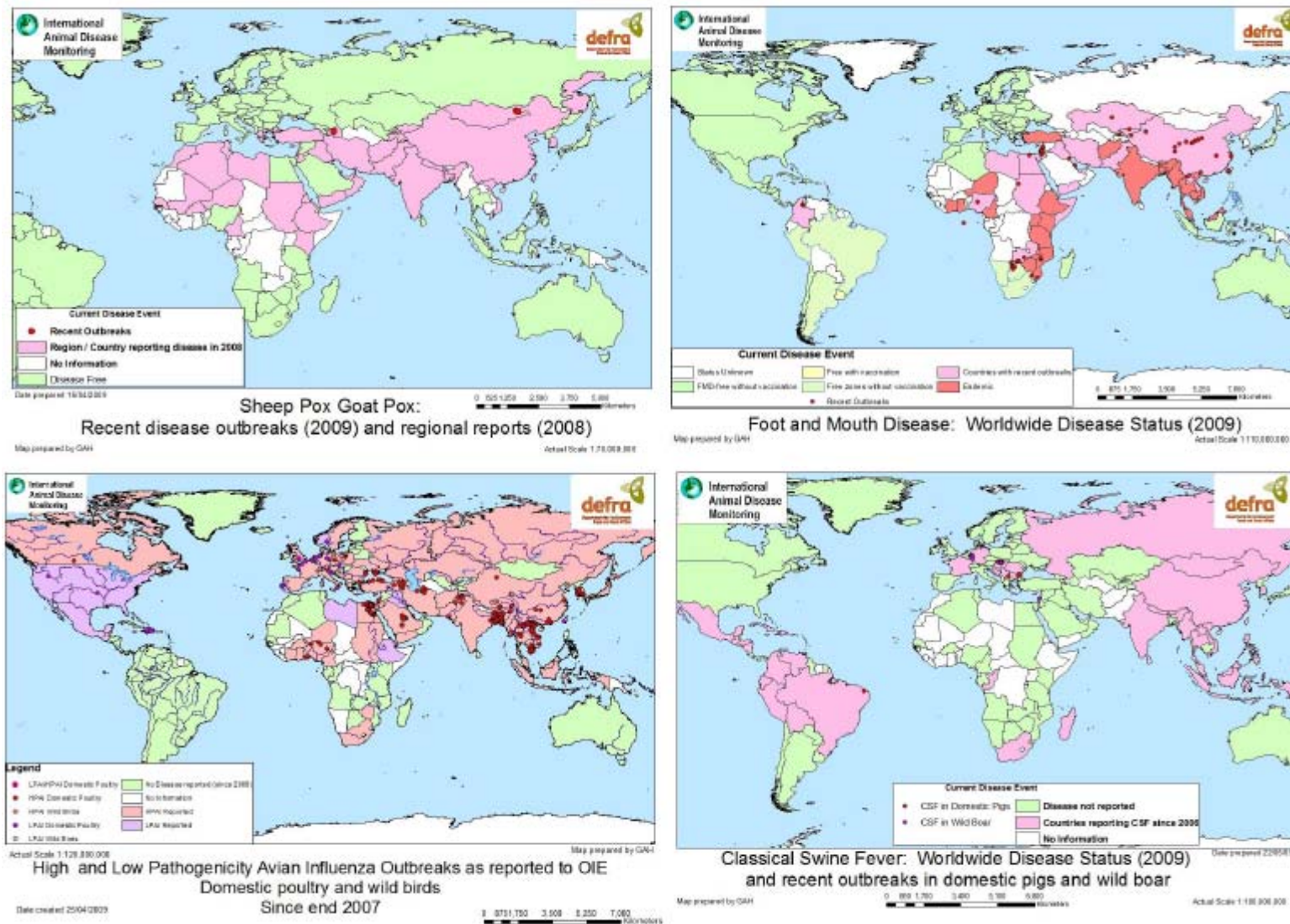
For an outbreak of exotic animal disease to occur in GB, a viable infectious agent must first be introduced to GB and secondly, it must reach a susceptible host (livestock) and spread disease within the animal population. The ways in which an infectious agent may accomplish this can be called **risk pathways**.

Pathways of animal **disease introduction** (how disease can arrive at our border) can be further categorised by:

#### **Trade Activities (legal and illegal)**

- Importation (legal or illegal) of live infected or exposed animal(s) or an animal carrying a disease vector. This could be livestock, companion animals, wildlife or zoological animals.

**Figure 2:** Worldwide distribution of four major exotic animal diseases: Sheep and Goat Pox, Foot and Mouth Disease, High and Low Pathogenicity Avian Influenza in domestic poultry and wild birds and classical swine fever in domestic pigs and wild boar.



- Importation (legal or illegal) of animal products. This includes animal products which are traded freely within the EU, imports to GB from third countries or personal imports carried into GB by travellers.
- Importation (legal or illegal) of live cultures, for example, germplasm, vaccines, reagents, tissue cultures, diagnostic samples etc. There is evidence that some laboratories importing live cultures e.g. sera, do not have animal containment facilities.

### Human Activities

- Movement of people, including tourism and trade related visits to livestock premises. Immigrants and travellers to GB may transport a foreign agent on their bodies, clothes, shoes and/or possessions (including personal imports described above).
- Air, sea or land transportation activities. Planes, ships, train, cars and military vehicles etc. are all capable of inadvertently conveying infectious agents or contaminated material to GB, either via contamination of the vehicle or hold (e.g. returning livestock vehicles which have not been disinfected etc.), or via the cargo carried. For example, used tyres may harbour mosquitoes or other disease vectors in trapped water, or there is the possibility of accidental “stowaway” animals in cargo containers, for example, bats, occasional cats, and arthropod vectors.
- Inadvertent release of an exotic infectious agent from a containment facility e.g. laboratory or quarantine facility
- Bioterrorism or intentional introduction of an exotic infectious agent either imported into the GB or released from a GB containment facility.

### Natural Phenomena

- Migration of infected or exposed birds could carry an exotic avian disease to the GB.
- Arthropod vectors (insects) blown on the wind may serve as biological vectors of infectious agents.
- Windborne spread of the infectious agent itself e.g. virus particles.

Risk factors which may cause the rapid **spread of disease** around GB after introduction into a susceptible population can include:

- animal movements within GB e.g. movements to and from markets, seasonal movements of livestock to and from grazing land.
- farming practices e.g. illegal waste food feeding, movements of farm staff or vets between premises, methods of slurry disposal or high animal densities on individual farms which increase the contact between animals.
- demographics of the livestock population e.g. age profile of the population or geographical location - premises in close proximity may increase the contact (of animals, people and vehicles) between such premises.
- narrowing of the urban-rural interface and other activities which bring the urban population in closer contact with livestock facilities e.g. visits to the countryside (feeding contaminated animal products to susceptible species), pet farms etc.
- proximity to wildlife and wildlife reservoirs of disease e.g. contact with wild or feral birds and animals which have been scavenging on landfill sites that contain contaminated animal products

GB has surveillance and control measures in place to safeguard against the incursion of exotic disease agents through these risk pathways and these are discussed further in Section 4. However, no counter measure will be completely failsafe and the benefit of implementing the counter measure must outweigh the cost or impact of an exotic disease incursion.

### 3.2 Comparative Ranking of Risk Pathways

Science-based risk analysis (such as that described in the OIE Handbook on Import Risk Analysis for Animals and Animal Products vols. I & II, 2004) is essential to determine what risk pathways pose a significant risk to human or animal health and, if so, what measures could be adopted to reduce that risk to an acceptable level.

This project has used the opinion of internal experts from Defra and the Centre for Epidemiology and Risk Analysis (Veterinary Laboratories Agency) to develop a synopsis of which pathways probably present the highest level of background risk from the exotic diseases in scope. This has resulted in an initial, very high level, qualitative ranking of risk pathways. A more precise quantitative approach or risk assessment would have required detailed epidemiological information and assessment beyond the scope, resources or time scales of this project.

Expert opinion was canvassed in two ways, via one to one meetings and a risk pathways workshop held on 21st October 2008. Participants of the meetings and the workshop are listed at Annex 2.

#### 3.2.1 Risk Pathways Workshop

A workshop was held to rehearse some potential risk scenarios with internal experts and identify pathways which present the highest risk or ‘unknown’ level of risk. The outputs from this workshop were used to inform a second workshop with Defra’s delivery bodies, to establish how effectively animal health control measures are being implemented against the pathways of highest risk and to understand the constraints Defra’s delivery partners are working under. The second workshop is described further in section 5.

The basic methodology for the workshop was reviewed with Alick Simmons, Marion Wooldridge, Mirzet Sabirovic, Andy Paterson, Julie Ross and the RPV Project Board (Nigel Gibbens, Ruth Lysons, Arik Dondi, Edgar Black, Bill Parish). Experts were also selected to be ‘scenario champions’ and briefed about the methodology and their required input prior to the workshop.

Workshop participants were given one of three different mythical disease profiles (described in Annex 3) and asked to become familiar with the characteristics of their disease and with the European Food Safety Agency (EFSA) interpretations of probability categories used in risk assessments (see table 4).

These categories describe probabilities textually on a scale from negligible (meaning that they cannot be differentiated from zero, and in practical terms can be ignored), through to extremely high and allowed the comparative ranking of risk pathways during the workshop.

**Table 4:** Probability categories used by the European Food Safety Agency (EFSA). For the purposes of the workshop, an additional category of ‘unknown’ was also added to this standard list

<b>Negligible</b>	So rare that it does not merit to be considered
<b>Very Low</b>	Very rare but cannot be excluded
<b>Low</b>	Rare but does occur
<b>Medium</b>	Occurs regularly
<b>High</b>	Occurs very often
<b>Very High</b>	Events occur almost certainly

Each group was provided with layouts displaying a series of 'nodes' representing the different ways in which their disease could be carried to the GB border, cross the border and be transmitted to a susceptible livestock population (see Annex 4). Participants were asked to:

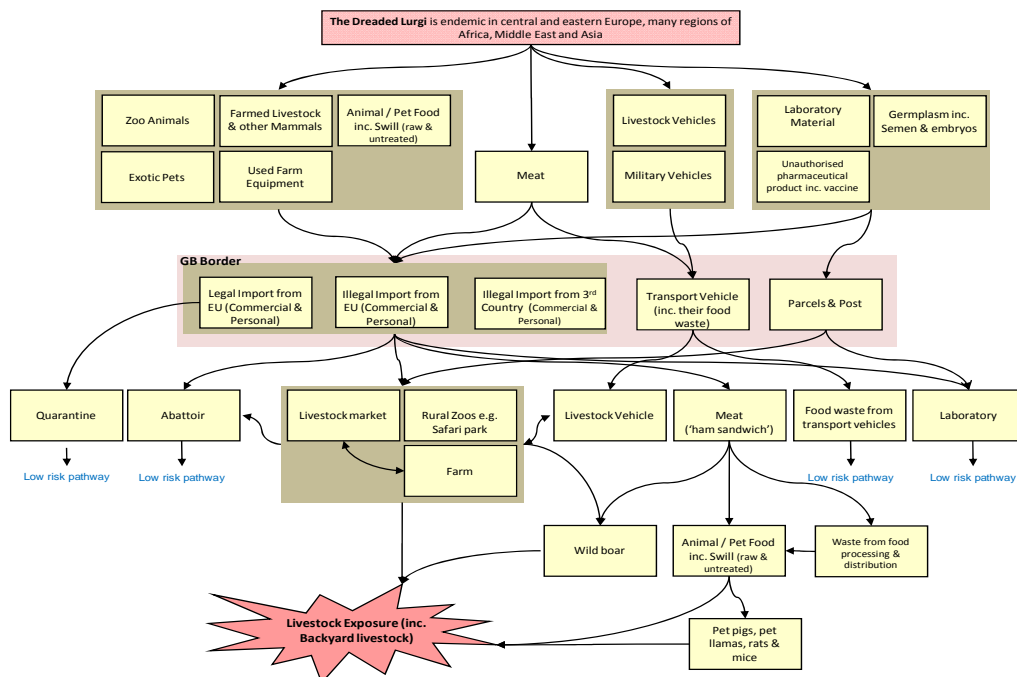
- determine the likelihood of each 'node' being contaminated by their hazard at the point at which it reached the GB border.
- determine the likelihood of each 'node' being contaminated by their hazard at the point at which it reached the susceptible livestock population in GB
- add in any missing nodes they could think of
- connect the high risk nodes to draw in the risk pathways of highest risk
- rank the pathways in order of importance

Throughout the workshop, participants were asked to document any assumptions they made about their scenario or any issues they wished to raise for further consideration. The nodes and pathways identified as high or very high risk for each mythical scenario are outlined in figures 3-5.

Some scenarios came to different conclusions about the relative risks associated with particular nodes or pathways. For example, scenario 1 rated the likelihood of onward transmission from quarantine facilities and laboratories as low, whereas scenario 2 rated onward transmission from quarantine as high and likewise, scenario 3 rated onward transmission from a laboratory as high.

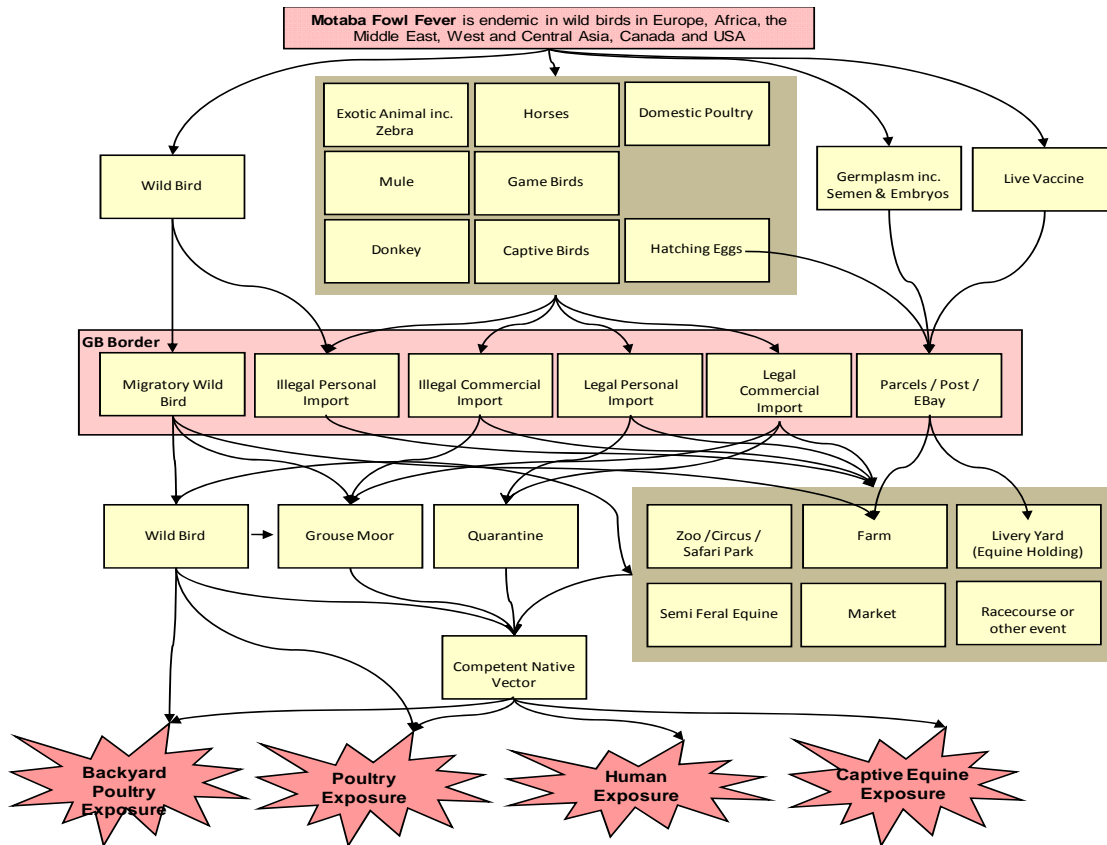
The differences in these ratings can be explained by the different profiles of the diseases used in each mythical scenario (see Annex 3), the way in which each disease is transmitted and what species are susceptible. Scenario 1 relates to a contagious viral disease of cattle, sheep and pigs, which is not vector borne and not transmissible to humans. The likelihood of this disease escaping a quarantine facility or laboratory, surviving in the environment and reaching a susceptible host was therefore designated as low - 'rare but does occur'.

**Figure 3: Pathways and nodes of highest relative risk from scenario 1**  
(see Annex 3 for the disease profile for this scenario)

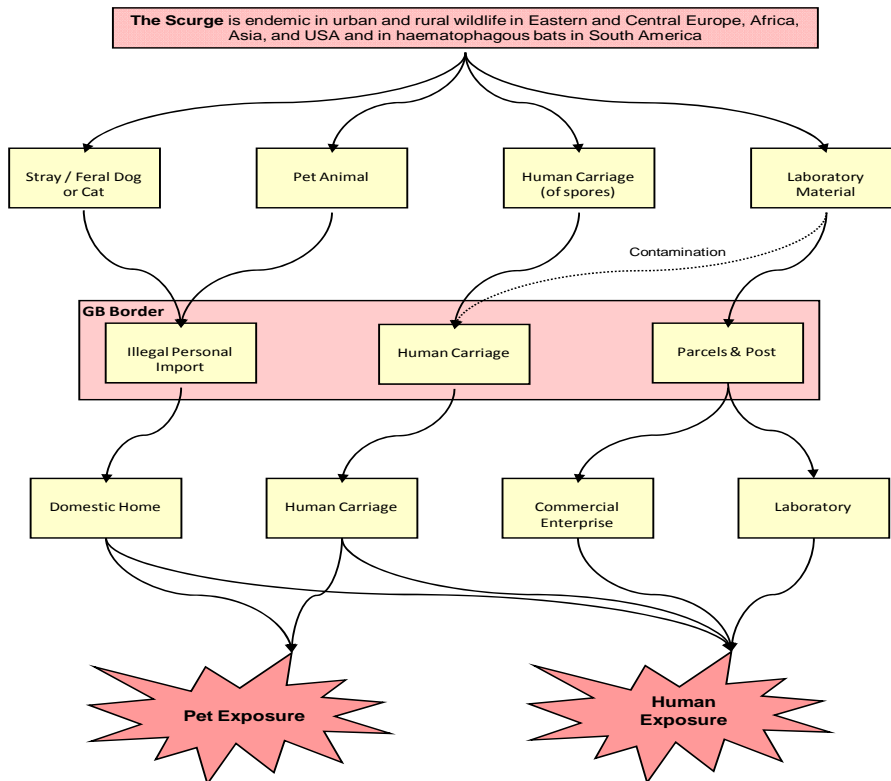




**Figure 4:** Pathways and nodes of highest relative risk from scenario 2 (see Annex 3 for the disease profile for this scenario)



**Figure 5:** Pathways and nodes of highest relative risk from scenario 3 (see Annex 3 for the disease profile for this scenario)



In contrast, mythical scenario 2 involved a vector-borne disease of horses and birds. The likelihood of a competent vector (mosquito, midge or tick in this mythical scenario) escaping quarantine facilities and making contact with a susceptible host i.e. bird, equine or human was deemed to be much more likely and rated as high – ‘occurs often’. Similarly, for mythical scenario 3, the likelihood of an unprotected susceptible laboratory worker being exposed to this mythical disease was rated as very high – ‘events occur almost certainly’.

For the purposes of this exercise, a risk pathway was concluded to be high risk if it was rated as such in any single scenario. The pathways designated as high or very high risk from the workshop are explored further in sections 3.3 and 3.4 and the results are extrapolated and applied to real exotic diseases in section 3.5.

### 3.2.2 Are there other pathways which may present a significant risk?

Additionally, all scenarios rated some nodes and pathways with an unknown level of risk and some as a medium level of risk (‘occurs regularly’) which the project may also wish to consider and investigate further. These pathways are listed in table 5 and will require further consultation with relevant experts before a final assessment can be made. A full write-up of the findings from the workshop is available upon request.

**Table 5:** Nodes and pathways rated as medium or ‘unknown’ risk by experts

<b>Medium Risk</b>	<ul style="list-style-type: none"> <li>• City and Petting farms</li> <li>• Urban zoos (rural zoos were classified as high risk by scenario 1 because of their closer proximity to livestock)</li> <li>• Pasture</li> <li>• Landfill sites</li> <li>• Susceptible wild mammals</li> <li>• Wind borne transmission of infected insect vectors from abroad*</li> </ul>
<b>Unknown Risk</b>	<ul style="list-style-type: none"> <li>• Rats and mice stowed in transport vehicles from abroad</li> <li>• Imports of milk and milk products, wool and fur, plant material</li> <li>• Imports of deer and the role of deer as wildlife reservoirs in GB</li> <li>• Private water supplies</li> <li>• Role of ticks in importing disease and onward transmission within quarantine facilities</li> <li>• Imports of pet animals</li> <li>• Imports of blood products</li> <li>• Inadvertent imports of sources of stagnant water e.g. in old tyres, and other sources of arthropod vector eggs/larvae</li> </ul>

\* some experts in the workshop felt that this pathway should have been designated as high risk (not medium)

### 3.3 Which pathways present the highest level of background risk?

The workshop process was necessarily simple in order to reach conclusions and make decisions about pathways of highest risk within the space of 2 hours, but it successfully identified our priority pathways as:

- (Commercial or Personal) Imports of livestock, meat and germplasm – particularly illegal imports from 3<sup>rd</sup> countries. Imports from EU were an ‘unknown’ but likely high risk.
- Importation of laboratory or pharmaceutical material for diagnostic or research purposes in GB – particularly as illegal personal imports (intentionally or through human error) or via parcels and post (inc. bioterrorism)
- Vehicles from abroad which have been carrying animals or are capable of carrying competent vectors e.g. pools of stagnant water in old car tyres
- Importation and movement of horses around GB
- Food waste from retail and food processing industry which is then fed to livestock
- Migration of wild birds
- Movement of livestock around GB (between farms, markets and other gatherings)
- Contact between livestock, competent vectors and susceptible wildlife populations/reservoirs e.g. wild boar, wild birds inc. grouse moor, semi feral equines

The explanation behind these conclusions is discussed in more detail in section 3.4. Each of these risk pathways was taken forward for further investigation in the second workshop with delivery agents described in section 5.

### 3.4 Why do these pathways present the highest risk?

#### 3.4.1 Imports of livestock, meat and germplasm from EU and third countries

According to the experts interviewed for this study, the greatest risk of importing an exotic disease into GB (including importation of Brucellosis from Ireland), occurs from two sources:

- **Human error or failings** - classification of imports as ‘legal’ or ‘illegal’ can be complicated, especially in regards to intra-community trade. There is a difference in the level of risk associated with personal imports and organised smuggling. Some individuals are not aware of legislation or make genuine mistakes but there is anecdotal evidence that public awareness campaigns (including campaigns specifically targeted towards ethnic minorities) may be helping mitigate this risk.

However, other imports can appear to be legal, because they have the correct certificates, but either:

- the actual product is not the one specified e.g. a meat product originating from a country under partial trade restrictions. In reality, it can be difficult to distinguish products originating from two different regions in the same country.
- or the product has been inspected or certified by unqualified personnel in the country of origin.

A Foot and Mouth risk assessment carried out by the European Food Safety Authority (EFSA) in 2006 highlighted the possible risks from deliberate mis-declarations of refrigerated freight containers – particularly porcine meat from China and bovine meat



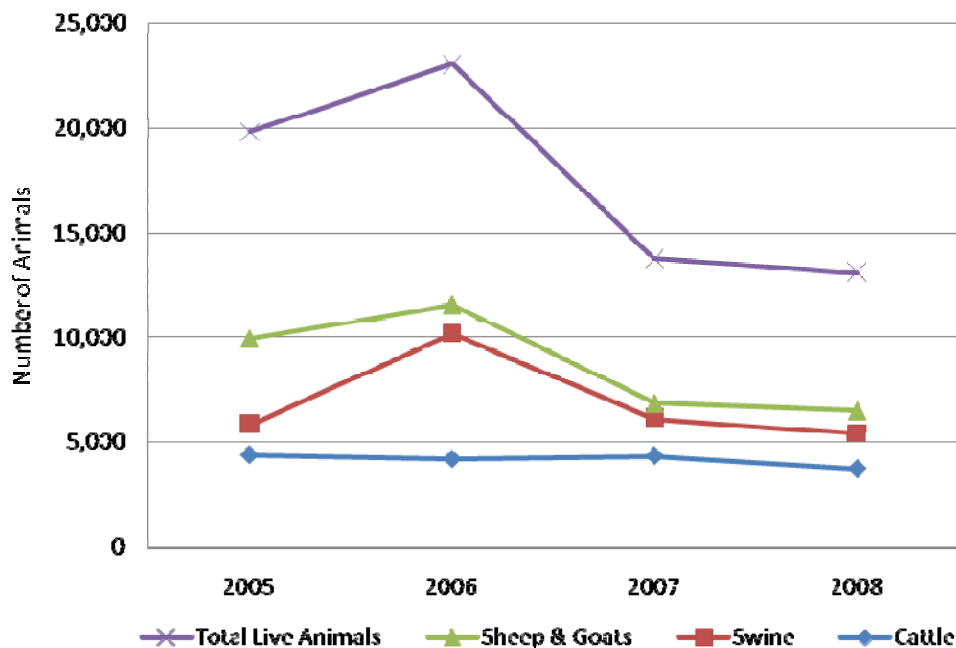
from India, being declared as frozen vegetables/other chilled consignments, or being certificated as being from an approved country of origin.

- **‘Silent spread’ of disease within the country of origin** - the greatest period of risk occurs when a country is believed to be free of disease, but disease is actually present and has not been found yet. This is when disease can be exported to GB and when surveillance with a view to early detection is vital.

Current trade rules within the EU mean that we are very reliant on the exporting country detecting and declaring disease. We cannot access the data the EU Commission holds on other countries. Our risk management strategy therefore depends the presence of a competent veterinary infrastructure in the country of origin, and on the Commissions Food and Veterinary Office (FVO) which conducts inspections to assess the ‘reliability’ of that infrastructure. It is believed that EU monitoring and FVO reporting is well researched and reliable, but Defra still performs a significant level of independent, ‘unofficial’ monitoring and flags potential incidents of disease to the EU for further investigation.

Other notable risks include sudden changes in trade patterns (which arise as a result of economic or political factors within the community that provide an incentive for farmers to import animals or products from a different region) and the trade triangulation & free trade which occurs within the EU (imports can be brought into the EU from a third country and then circulated freely within the EU because there are no border controls within the community). Not all member states may carry out the same level of checks on illegal imports and will face different challenges (e.g. long land borders, different ethnic makeup of population). However, there is now very little trade in live animals into the EU (see figure 6 and section 3.4.1.1), most traditional exporters (of live ruminants) to the EU are now member states, so the vast majority of the trade (and therefore the risk) is now within member states. These member states are supported by EU funding and co-operation e.g. community funded vaccination programmes in Romania.

Figure 6: Number of Cattle, Swine, Sheep & Goats imported into the EU from other parts of the world (information taken from UN Commodity Database)



### 3.4.1.1 Live animals

Table 6 indicates which animals are a risk of importing certain animal diseases into GB and then disseminating the disease around the livestock population. Certain animals represent a higher risk than others for certain diseases. For example, cattle, sheep and goats are a risk for bluetongue disease, particularly as they do not always exhibit clinical signs when infected. However equidae (horses, donkeys, mules etc) are not considered a high risk for West Nile virus as they are “dead end” hosts and would therefore not be involved in onward transmission. On the other hand, certain species of birds are undoubtedly a risk for transmission of West Nile virus.

Livestock are very rarely imported from outside the EU, as only a few countries can sufficiently guarantee disease status and animal health certification to EU standards. It is also becoming increasingly less appropriate to transport animals over a large distance, because of welfare considerations.

On rare occasions zoo animals are imported from third countries. If there is existing animal health legislation this is used as appropriate, otherwise risks associated with zoo animal movements are undertaken on the basis of a veterinary risk assessment and appropriate health certification.



However, horses are regularly imported from outside the EU, for reasons such as temporary licences for sporting fixtures or for breeding purposes. For example in 2008, there were over 650 horses imported for various reasons from the USA alone (horses are discussed further in section 3.4.4).

TRACES is a web-based IT service for the application for, and issuing of, Intra Trade Animal Health Certificates (ITAHCs) and Common Veterinary Entry Documents (CVEDs) for third country trade in live animals, their products and germplasm. TRACES is the system used for notifying Member States of movements of live animals, germplasm and certain other commodities into or through their territories. Both live animal imports from Third Countries as well as live animal movements for trade purposes within the EU are recorded.

For example, according to TRACES, there were over **2500 consignments of cattle, sheep, goats, deer and other livestock moved from the EU to the UK in 2007** and over **4000 in 2008**.

**Table 6:** Risk to the GB animal population of importing a live animal with a particular disease through EU and third country trade

	African horse sickness	African swine fever	Avian influenza	Bluetongue	Brucellosis (Brucella abortus)	Brucellosis (Brucella melitensis)	Classical Swine Fever	Equine Viral Encephalomyelitis	Equine Infectious Anaemia	Foot and mouth Disease	Goat Pox	Newcastle disease	Pests des petits ruminants	Rabies	Rift Valley fever	Sheep Pox	Swine vesicular disease	Vesicular stomatitis	West Nile Virus
Equidae	Risk																		
Bovines					Risk														
Swine		Risk																	
Sheep & Goats																			
Poultry																			
Other live animals (includes exotics)																			
Primates														3rd*					
Birds of prey																			
Psittaciformes (including parrots & parakeets)																			
Pigeons																			
Other birds																			
Travelling circuses and travelling menageries																			

 = Risk       = this group of animals or birds are not known to be infected or susceptible with the disease, (or they are “dead end” hosts)

\* risk is associated with 3<sup>rd</sup> country imports only

Information is taken from the OIE Terrestrial Manual of Diseases and is for **visual purposes only**. **The tables have been simplified**. For full details, please refer to the OIE Manual.

### 3.4.1.2 Meat products & germplasm

In addition to live animals, there here are several thousand imports of meat products (see table 7) and other animal products from within and outside the EU each year.

**Table 7:** Imports of meat products in 2007<sup>1</sup>

Description	EU/Non-EU	Quantity of Imports (Tonnes)	Value (£)
Bacon and ham	European Union (EU)	277,496	563,434
Beef and veal	European Union (EU)	186,592	456,375
	Non EU Countries	53,546	156,869
Beef products (inc. corned beef)	European Union (EU)	63,029	91,858
	Non EU Countries	69,441	98,459
Edible offal and other meat	European Union (EU)	37,663	29,296
	Non EU Countries	14,026	13,452
Lamb and mutton	European Union (EU)	13,106	26,049
	Non EU Countries	101,028	253,295
Pork	European Union (EU)	458,407	662,156
	Non EU Countries	4,495	8,255
Poultry meat (inc. poultry offal)	European Union (EU)	359,055	737,453
	Non EU Countries	24,350	38,449
Sausages and related products*	European Union (EU)	85,552	200,567
	Non EU Countries	17,970	27,161

\*Sausages can be any meat, but most likely pork

Most imports of animal products are classified as meat and edible goods for human or animal consumption, and their level of risk will be associated with the occurrence of transmissible disease in the country of origin. Some imported products of animal origin can be infected with disease and be capable of introducing or spreading exotic disease to our animal populations. Certain products are more risky than others for certain diseases (see table 8). For example, the rabies virus is rapidly inactivated in the environment and rarely found in animal products, so there is little risk from these types of commodities. On the other hand, the virus responsible for swine vesicular disease is resilient to deactivation in the environment and can be found in meat, by-products and faeces.

The web based IT system, TRACES, also registers both trade in meat products and germplasm. For example, **during 2008 there were over 100 consignments of bovine semen imported into the UK from outside the EU, and over 60 consignments of semen from other animals, or ova and embryos.**

<sup>1</sup> Information supplied by DEFRA Overseas Trade Data System (MOTS) as at 1 October 2008.

**Table 8:** Risk to GB animal population of importing an animal product with the disease from EU or third country trade

	African horse sickness	African swine fever	Avian influenza	Bluetongue	Brucellosis (Brucella abortus)	Brucellosis (Brucella melitensis)	Classical Swine Fever	Equine Viral Encephalomyelitis	Equine Infectious Anaemia	Foot and mouth Disease	Goat Pox	Newcastle disease	Pests des petits ruminants	Rabies	Rift Valley fever	Sheep Pox	Swine vesicular disease	Vesicular stomatitis	West Nile Virus
Meat and Edible Meat Offal	Red	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Dairy Produce, birds eggs	Green	Green	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Other edible products of animal origin	Green	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Oil, seeds and grains; straw and fodder	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red
Animal fats, oils and waxes	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red
Preparations of meat e.g. sausages	Green	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Preparations of a kind used in animal feeding	Green	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Pharmaceutical (blood) products inc vaccines	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Fertilisers	Green	Green	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Albuminoidal substances	Green	Green	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Raw hides and skins	Green	Red	Green	Green	Red	Red	Red	Red	Red	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red
Wool, horsehair, animal hair	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Pig, hog or boars bristles and hair; badger hair	Green	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Horsehair and horsehair waste	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Skins and other parts of birds, their feathers or down	Green	Green	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Bones and horn-cores	Green	Red	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Sinews or tendons; waste of raw hides or skins	Green	Red	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Glands and other organs for organo-therapeutic uses	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Semen	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red
Guts, bladders and stomachs of animals	Green	Red	Red	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red

 = Risk       = the animal product is not known to carry the disease causing agent or cannot transmit the disease onwards

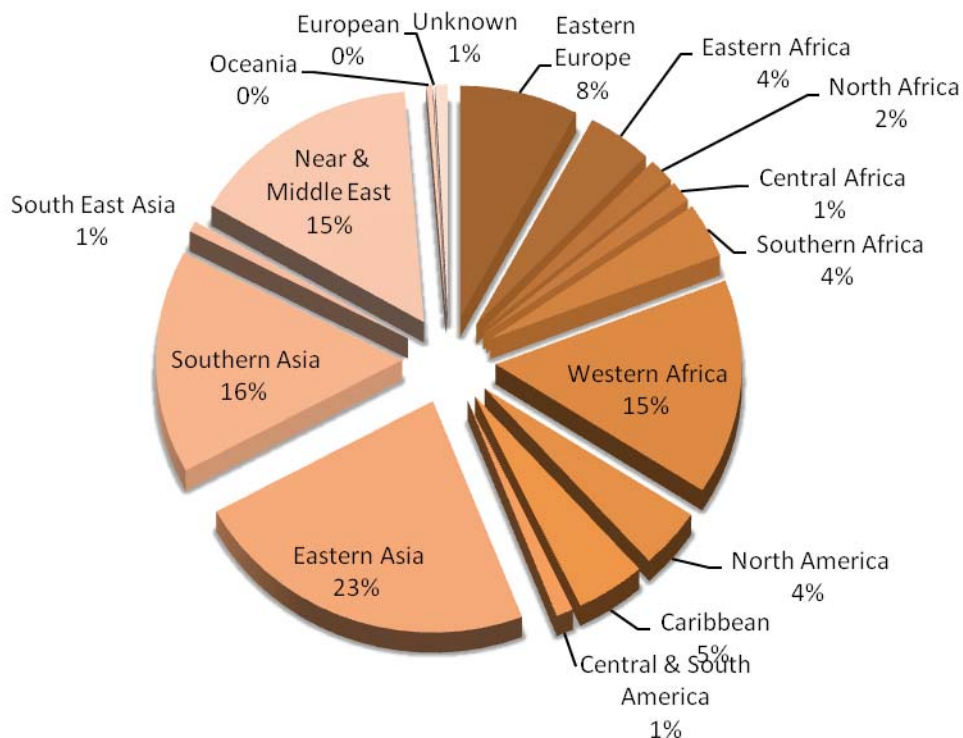
Information is taken from the OIE (World Health Organisation) Terrestrial Manual of Diseases and is for **visual purposes only**. The tables have **been simplified**. For full details, please refer to the OIE Manual.

### 3.4.1.2.1 Illegal Imports

An import may be considered illegal for a variety of reasons. The paperwork and certification may not match that of the commodity. This might be a genuine mistake, which is easily rectified by contacting the consignee for confirmation. Or, alternatively the product may be a restricted (for example if the source species is on the CITES<sup>2</sup> list for endangered species) or be from a country where disease status is not of a standard sufficient to give confidence in the certification of the originating country.

It is very difficult to quantify the level of illegal imports entering the country each year. However the UK Border Agency (UKBA) do make seizures of illegal imports of products of animal origin. In 2007-8 UKBA seized over 180 tonnes and over 12,000 litres of products of animal origin (see figure 7). Defra and the UKBA continue to work closely together to mitigate the risks from illegal imports by ensuring enforcement is allied to the changes in veterinary risk, joint publicity campaigns at home and abroad to raise awareness of the rules amongst passengers, and work at the EU level to encourage greater co-operation between Customs and veterinary services.

Figure 7: Products of Animal Origin seizures by region from April 2007 to March 2008. (percentages will not total 100 due to rounding)



Under normal circumstances, most animal products which are brought in as personal imports and not consumed, probably end up in domestic waste and landfill. However, during interviews, some experts raised concerns over the increased use of migrant farm workers and non compliance with animal by-products rules. These workers can bring in personal imports of animal products for their own consumption and present a direct risk pathway to livestock on farm.

The transient nature of the migrant workforce, its potential movement between countries, and the desire by some to avoid contact with governmental agencies, makes the exact number of migrant farm workers difficult to determine. The number of these workers in Europe is believed

<sup>2</sup> (the **Convention on International Trade in Endangered Species of Wild Fauna and Flora**) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival and it accords varying degrees of protection to more than 33,000 species of animals and plants.

to be substantial, but few data are available. The UK June Survey of Agriculture and Horticulture (Land Use, Livestock and Labour on Agricultural Holdings at 1 June 2008) estimated the number of seasonal and casual labour employed on farms to be 61,700 (a 5% increase on the previous year), but it is unknown what proportion of this figure is migrant labour.

### 3.4.2 Imports of laboratory or pharmaceutical material for diagnostic or research purposes

The ability to handle animal pathogens is essential if we are to fully understand infectious diseases and to develop effective vaccines. Work conducted in GB laboratories is of both national and international importance:

- The Institute of Animal Health in Pirbright is a world reference laboratory for foot and mouth, rinderpest and peste des petits ruminants, and a national reference laboratory for swine vesicular disease, African swine fever, bluetongue, African horse sickness, vesicular stomatitis and Sheep and Goat pox.
- The Veterinary Laboratories Agency at Weybridge is an OIE and national reference laboratory for diseases such as Aujeszky's disease, avian influenza, brucellosis, classical Swine fever, equine encephalomyelitis, equine infectious anaemia, Newcastle disease and rabies.

Reference laboratories are worldwide centres of expertise, research and training in specific diseases; they provide a worldwide diagnostic service, develop diagnostic capability in important diseases and maintain a reference collection of disease agents. As such, unsolicited and uninspected samples and other diagnostic material (which may or may not be infected with animal pathogens) are sent to GB from abroad. This material is licensed by Defra before it can enter the country (see table 9). The licence stipulates the conditions under which the pathogen or carrier must be handled and the types of containment necessary while in GB. The purpose of imposing these conditions is to protect the British livestock and poultry industries from infection by pathogens knowingly or unwittingly imported into GB.

Table 9: Number of animal pathogen transfer licences issued in 2008

Exotic Disease	No. of licences
African horse sickness virus	1
African swine fever virus	3
Aujeszky's disease virus	0
Avian influenza viruses	8
Bluetongue virus	71
Brucella abortus	3
Brucella melitensis	3
Classical swine fever virus	12
Equine encephalomyelitis viruses	2
Equine infectious anaemia virus	0
Foot and mouth disease virus	36
Newcastle disease viruses	1
Peste des petits ruminants virus	1
Rabies virus	3
Rift Valley fever virus	0
Sheep and goat pox virus	0
Swine vesicular disease virus	7
Vesicular stomatitis virus	2
West Nile virus	1

Controls to safeguard the importation of laboratory pathogens and prevent the release of disease into the environment are specified under Importation of Animal Pathogens Order (IAPO) 1980 (for third country imports only) and the Specified Animal Pathogens Order (SAPO) 1998 (see section 4.3.2). However, the more general importation of biological material for scientific research is not regulated by this legislation, even though it may be contaminated with animal pathogens.

Information supplied by experts also suggests that the postal service is often used to exchange research material (within GB and from abroad) even though this is not allowed or monitored.



Within GB the storage and manipulation of animal pathogens must be licensed and conducted in facilities with an appropriate level of containment, depending on the level of hazard the pathogen poses. A small number of laboratories also have storage only licences. Once a licence expires, the laboratory must ensure that arrangements are made with another appropriate facility to destroy stock cultures and any other contaminated material. Licencees are required to confirm this in writing. It is illegal to retain such pathogens if there is no licence and Defra continues to work with the HSE to ensure this is enforced as part of their inspection programme.

In the UK, the Advisory Committee on Dangerous Pathogens (ACDP) categorises human pathogens into hazard groups 1 to 4 with corresponding containment levels. Defra also defines its own hazard groups for SAPO (see table 10) and its own corresponding containment levels. The SAPO hazard groups are based on recommendations published by the OIE, there are no pathogens in category 1 under SAPO.

**Table 10:** Notifiable exotic diseases in scope and their respective classifications under ACDP and SAPO

Notifiable Disease	ACDP Classification*	SAPO Classification**
African Horse Sickness	1	3
African Swine Fever	1	4
Aujeszky's	1	2
Avian Influenza (Bird flu)	3	4
Bluetongue	1	3
Brucellosis (Brucella abortus)	3	3
Brucellosis (Brucella melitensis)	3	3
Classical Swine Fever	1	3
Equine Viral Encephalomyelitis	3	3
Equine Infectious Anaemia	1	3
Foot and Mouth Disease	1	4
Goat Pox	1	3
Newcastle Disease	1	4
Pest des Petits Ruminants	1	4
Rabies	3	4
Rift Valley Fever	3	3
Sheep pox	1	3
Swine Vesicular Disease	1	4
Vesicular Stomatitis	2	3
West Nile Virus	3	3

**\*ACDP Categories**

- 1 Unlikely to cause disease in humans
- 2 Can cause human disease and may be a hazard to employees; unlikely to spread in the community and there is usually effective treatment available
- 3 Can cause severe human disease and may be serious hazard to employees; it may spread in the community but there is usually effective treatment available
- 4 Causes severe human disease and is serious hazard to employees; it is likely to spread to the community and usually no effective treatment available

**\*\*SAPO Categories**

- 1 Disease producing organisms which are enzootic and do not produce notifiable disease
- 2 Disease producing organisms which are either exotic or produce notifiable disease, but have low risk of spread from the laboratory
- 3 Disease producing organisms which are either exotic or produce notifiable disease and have a moderate risk of spread from the laboratory
- 4 Disease producing organisms which are either exotic or notifiable and have a high risk of spread from the laboratory



In his recent review (December 2007) of the regulatory framework for animal pathogens, Sir Bill Callaghan identified 8 facilities in GB operating at ACDP containment level 4 (CL4), 352 CL3 facilities in England, 21 CL3 facilities in Wales and 43 CL3 facilities in Scotland. At the time of writing this report there are a total of 51 SAPO approved facilities in GB. Of these 51, 9 are for work with pathogens classified as Category 4, the highest SAPO risk level, all of which are in England.

The Callaghan review recommended that Defra, Department of Health and the Health and Safety Executive (HSE) work together to develop a single regulatory framework to govern work with both human and animal pathogens, including a common set of containment measures to apply to both and that HSE become the single regulatory body for both animal and human pathogens. During interviews, experts emphasised the importance of managing this transition to ensure that HSE's new risk and inspection model provides for adequate management of animal pathogens into the future.

In summary, it is clear that the need to manage the risks associated with importation of scientific material needs to be balanced against the pressure not to over regulate and the benefit GB derives from having research and diagnostic facilities which are capable of handling dangerous pathogens.

### **3.4.3 Vehicles from abroad which have been carrying animals or are capable of transporting competent vectors**

Indirect contact between animals, when an uninfected animal comes into contact with infected material from a diseased animal is one of the main ways in which disease can spread. Transport vehicles (and their loading ramps) which have previously carried infected livestock (live, dead or animal carcasses destined for the food chain) may contain infected material until they have been effectively disinfected. Between disinfections, cross-contamination to other animals can occur when new animals are loaded onto the vehicle or to new locations when trucks are picking up animals from different premises to make up a full load for delivery e.g. picking up pigs for slaughter.

It is well documented that transportation lorries played a major role in the incursion of the severe epidemic of classical swine fever in the Netherlands in 1997, to an area which has one of the highest pig and herd densities in Europe (Elbers et al, 1999). The ultimate source of the Dutch outbreak was most probably via swill fed to pigs in Germany, with subsequent transmission to Holland by contaminated lorries (Report to the OIE, 2002). In GB, controls are in place to ensure the proper cleansing and disinfections of transport vehicles between consignments of animals (see section 4.3.2 for further commentary on the cleansing and disinfection of vehicles).

Theoretically, transport vehicles e.g. aircraft, lorries, shipping containers etc. could also mechanically transport infected insect vectors to new locations where they could survive and infect local livestock e.g. midges infected with bluetongue, mosquitoes infected with west Nile virus. Long distance transport has been documented for mosquito vectors of malaria via containers and shipping but this has generally been eggs and larvae (Tatem *et al.*, 2006). Adult midges have also arrived in containers from Japan to New Zealand (Biosecurity NZ). However, recent risk assessments conducted in Scotland and Ireland which have considered the risk of introducing Bluetongue into these countries via this method have considered the risk to be so low that the treatment of vehicles or containers with insecticide would not be justified at present (see bluetongue risk assessments published at [www.agriculture.gov.ie](http://www.agriculture.gov.ie) and [www.scotland.gov.uk](http://www.scotland.gov.uk)

### 3.4.4 Importation and movement of horses around GB

Horses<sup>3</sup> enter the UK from EU Member States (MS) and are imported from Third countries on a relatively frequent basis. Horses move for purposes of breeding, sport, and leisure activities. Horses may also be exported for slaughter however it is unlikely that horses will be imported to the UK for slaughter.

In 2005, at least 5867 horses entered GB from other MS. Movement of horses between UK, Ireland and France (unless moving for slaughter) is not recorded as they move under the Tripartite agreement. Movement under the Tripartite agreement is likely to constitute the majority of horse movement into UK and thus the figure for horses entering the UK is likely to be much higher than that listed above. In the same period, 2771 horses were imported from Third countries. The majority of these horses were imported from Argentina.

#### 3.4.4.1.1 Movement of horses from other member states

Movement of horses within the European Union are subject to harmonised rules. Movement is authorised on the basis of health checks and certification performed in the Member State of origin. Movement of animals into the UK is monitored by information being sent from the MS of origin to UK on the TRACES system. Where the UK is the final destination, we are permitted to do random, non discriminatory checks at the certified point of destination. However, most horse movements are not subjected to this system and the unrecorded movement may introduce risks to the system that should be considered.

The exception exists within the basic regulatory framework primarily to allow the rapid movement of competition/race horses; this is essential for the equine industry. Two main exceptions exist:

- Horses (other than horses for slaughter) moving between Ireland, France and UK are not subject to any health checks, although owner/transporter has a duty not to move any horses with signs of disease or that are unfit for transport. Horses must be accompanied by their passport but no other documentation (excepting welfare in transport documentation) is required and no records of these movements are maintained.
- 'Registered' horses (equidae registered for entry in a studbook (Council Directive 90/427)) can travel within the EU for 10 days based on one Intra Trade Animal Health Certificate (ITAHC). For example, if a UK registered horse moves to Europe, an ITAHC (B) must be completed by an Official Veterinarian prior to leaving UK. This is valid for 10 days. The horse can then move through Europe and return to UK within 10 days with no further certification. The assumption has been made that 'registered' horses are likely to be of a higher health standard than non-registered horses and thus increased freedom of movement presents less of a risk with these animals. However, the definition of 'registered' equidae is such that horses travelling as 'registered' horses are not necessarily of a higher health status. In reality, it is expected that most horses moving under ITAHC(B) will be competition or racehorses. These horses are generally maintained to a high health standard however they are frequently mixed and moved resulting in the potential of disease transmission and spread.

Potential risks identified include (but are not limited to):

- Horses (other than horses for slaughter) moving between Ireland, France and UK (see above). This route of travel is very important for movement of racehorses and sports horses. There is no ability to trace animals that move under this agreement. (However, during the

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<sup>3</sup> The term 'horses' refers to horses, ponies and donkeys

EIA outbreak in Ireland, horses that had moved from Ireland to UK were traced through the use of records available in Ireland (these records are not compulsory). In addition to inability to trace these movements, specific risks identified with the tripartite agreement include:

- France permits horses to enter France after transiting through Senegal by air. Horses are not allowed to disembark in Senegal. It is unclear how well protected against vectors the horses are at this time, although France has assured the UK that all steps are taken to avoid any risks. African horse sickness is known to be present in Senegal. Horses initially destined for France that subsequently move from France to UK cannot be traced unless the UK is declared as the final destination for the movement at the border inspection post (in this case the movement from the border inspection post (BIP) to UK will be recorded in TRACES. The majority of horses coming to France via Senegal are coming from South America. This risk pathway was considered in a recent risk assessment on African horse sickness, published on the Defra website.

(It is possible that veterinary inspections and certification prior to movement are not equally well enforced across all MS (anecdotal reports). There is concern from some external stakeholders that animals could reach France without veterinary inspection or certification and subsequently travel to UK under the tripartite agreement. Such movements would thus result in horses from MS other than tripartite countries entering UK with no record. Defra believes that France takes their responsibility to check horses entering the country very seriously and abide by all measures within the Vetchecks directive).

- Equine Infectious Anaemia (EIA) is present in Romania. Horses leaving Romania must be officially tested for EIA prior to leaving and must be certified as EIA negative. There is significant concern from external stakeholders in UK and Italy about the enforcement of this regulation (anecdotal reports).
- Standards of enforcement of veterinary checks and certification in all MS should be uniform, however, as described above, there are anecdotal reports of lack of enforcement which could lead to entry of horses to UK of unknown or misclassified history.
- Registered horses can travel through the EU on a health attestation or TRACES certificate in accordance with 'Annex B' of Directive 92/65. Horses are inspected in the first MS of origin and can then travel for 10 days through MS without the need for further certification (as described above). As mentioned above, there is a duty for anyone transporting horses not to move them if they are showing signs of illness or are unfit to travel. Horses will often travel to several competitions and countries during this time. No record is maintained in UK of where horses have been when they return to UK. Horses at such events will mix with horses from throughout Europe. It is well documented that mixing of horses at events is an excellent mechanism of disease transmission thus horses travelling in this way may present a health risk to UK. Horses are allowed to enter Romania on Annex B and are not normally tested for EIA prior to returning to UK. Premises affected by EIA in Romania will be under restrictions meaning no visiting horses should enter.

In theory, legislation exists to negate the risk of many of the potential risks identified above, however due to the inability to trace much of the movement of registered horses within MS and the concern that exist regarding the enforcement of current legislation, the risks outlined above must be considered.

#### 3.4.4.1.2 Imports of horses from third countries

Imports to the EU from Third countries are recorded on the TRACES system (temporary and permanent imports). Inspection and certification occurs at the first Border Inspection Post in the

EU; no routine further inspection occurs in country of destination however the country of final destination may carry out random non discriminatory checks at destination.

Imports to EU are only allowed from a designated list of countries (and zones of Third countries) (listed in Decision 2004/211). The countries listed are selected based on health status on a risk assessed basis. Legislation is thus in place to prevent movement of horses from countries of low or unknown health status into EU. In addition, legislation exists to health check horses at entry to EU and to document their entry. However, once horses have entered the EU, the risks that are identified above must be considered.

#### 3.4.4.1.3 Movements of horses within GB

There is no requirement for registering movements of horses once they have moved beyond their first destination upon entry into UK. This makes tracing very difficult. Many horses will move frequently and cover large distances. The majority of long distance movement is by racehorses and competition horses (anecdotal information) which are also the sectors of the horse population most likely to have entered UK from MS or third countries.

Movement of horses around GB is a risk for disease spread. However, capturing movement data for the GB equine population would require great input of resource. The risk associated with lack of knowledge about horse movements within GB must be weighed against the costs of obtaining such data. In addition to problems associated with tracing horse movements, the locations of equine premises within the UK is unknown, and no data gathering of equine events occurs. Individual events do have records of animals attending but there is no requirement to store this data or to record the horse's intended destination.

#### 3.4.5 Catering waste from retail and food processing industry

Exotic animal disease pathogens can survive in some foodstuffs containing animal matter or animal-contaminated matter. Food preparation processes may not destroy all infectious agents and animals eating these foods may then be exposed to these infectious agents and a disease outbreak can result.

**Catering waste** is an official term defined as all waste food, whether raw or cooked, including used cooking oils which arise in premises such as:

- Household kitchens
- Restaurants
- Fish and Chips/Pizza/Kebab shops
- Takeaway shops
- Canteens
- Cafes; or
- Vegetarian kitchens/restaurants

It also includes food waste from other premises (food factories, distribution warehouses etc.) that contains or has been in contact with animal by-products (such as raw eggs, meat, fish products). Following the outbreak of Foot and Mouth disease in 2001, the first case of which was found to be at a farm where unprocessed waste food was being fed to pigs, the Government carried out a review of the practice of swill feeding. This outbreak and the subsequent review led to legislation banning the feeding of catering waste to any farmed animals or any other ruminant animal, pig or poultry. This is now reflected in EU-wide animal by-products legislation (see section 4.3.2).

**International catering waste** is defined as animal product food waste, and any other material that it is mixed with (including disposable cutlery, plates etc) that comes from international ships or aircraft. All vessels that bring in catering waste from outside the EU are considered to be

carrying international catering waste. This includes aircraft, ships, boats, fishing boats, yachts and other pleasure craft. A quantitative risk assessment for the importation of Foot and Mouth disease has been completed for ship and aircraft waste (Adkin *et al.*, 2008).

In legislation, there are different classifications of animal by-products and different disposal rules are set for each. International catering waste is classed as Category 1<sup>4</sup> material. Once it has been taken off the ship, boat or aircraft and has been put in a collection bin/waste stream, the manager of that waste stream is responsible for ensuring that the waste is collected, stored and taken to either an approved landfill site, incinerator and rendering plant by a transporter registered as a Waste Carrier by the Environment Agency. Responsibility for the facilities and management of the waste stream may lie with the Port, Marina, an appointed waste contractor or the airline catering company depending on local circumstances.

### 3.4.6 Livestock locations and movement of livestock (cattle, sheep, goats, pigs and farmed deer) between markets, farms and other animal gatherings

#### 3.4.6.1 Livestock Populations

The UK has an extensive livestock industry. On the 1<sup>st</sup> June 2008 there were approximately 10 million cattle, 33 million sheep, 4.7 million pigs, 166 million birds (classed as poultry), 96 thousand goats and 31 thousand farmed deer in the UK<sup>5</sup>. The numbers and distribution of the major livestock species (cattle, sheep, pigs and poultry) across GB are shown in table 11 and the maps at figure 8. A description of these livestock sectors is provided in the following paragraphs using information taken from the UK Veterinary Surveillance pages on the Defra website.

**Table 11:** Number and type of livestock in GB on 1<sup>st</sup> June 2008<sup>3</sup>

Country	No of Cattle	No of Sheep	No of Pigs	No of Poultry	No. of Holdings
England	5.5 million	15.5 million	3.9 million	128 million	210,000
Scotland	1.9 million	7.1 million	0.44 million	13.8 million	51,489
Wales	1.1 million	8.5 million	0.02 million	7.2 million	11,200

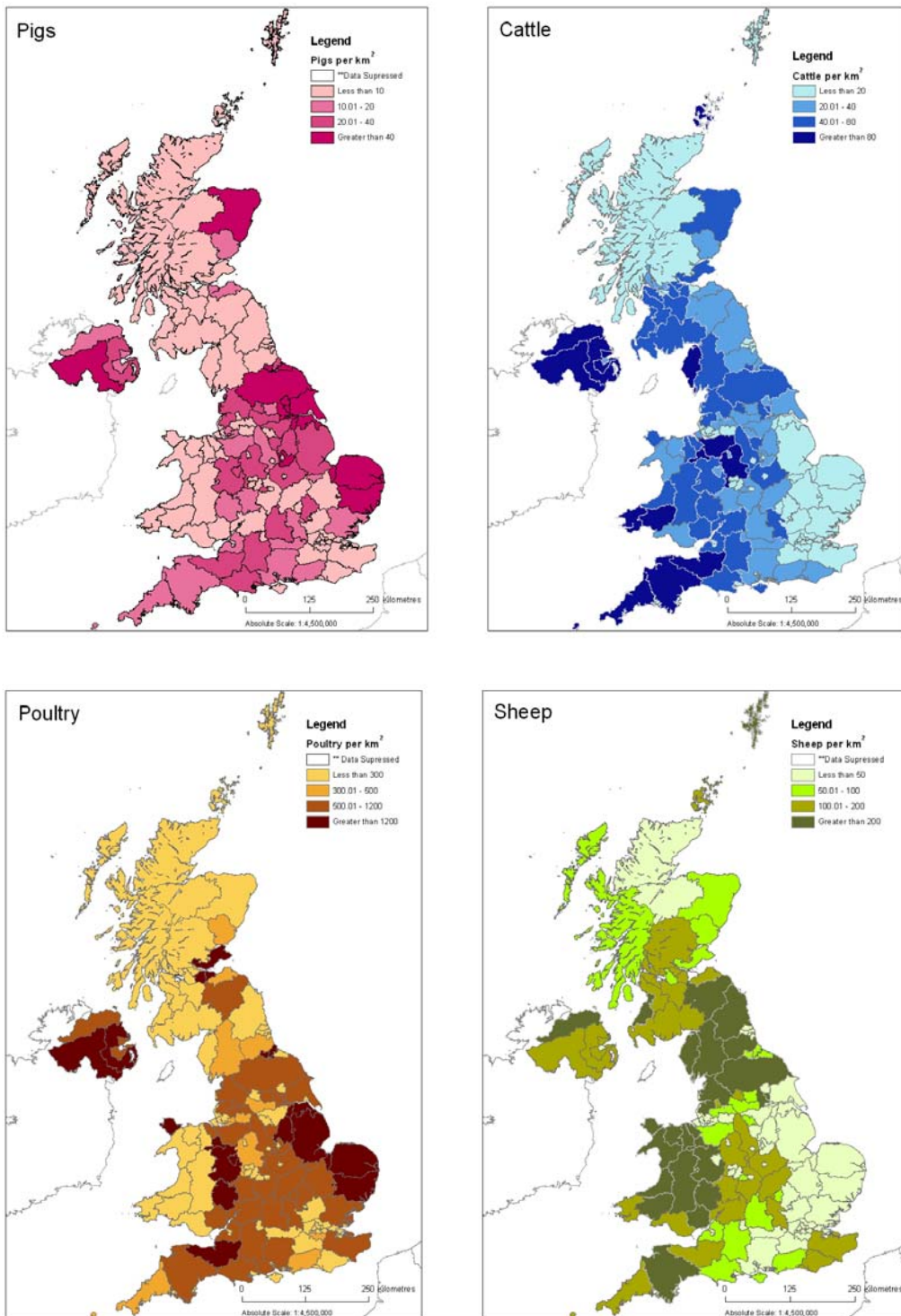
- Cattle** in the UK are mainly used for producing milk or beef. The UK has an important dairy industry and is the 7<sup>th</sup> largest milk producer in the world and the 3<sup>rd</sup> largest in Europe. Although largely self sufficient in milk, we still import and export significant quantities. The UK beef industry also produces approximately 0.7 million tonnes of beef per year. There are a small number of buffalo herds also kept to produce milk to make mozzarella cheese. Buffalo are susceptible to most of the important diseases of cattle, so cattle legislation also applies to them. Everyone who keeps cattle must be registered and animals are individually identified by numbered tags fixed permanently to their ears. Individual ear tag numbers are recorded in a Government database called the Cattle Tracing System and farmers must report all births, deaths and movements of their cattle to this system (see section 4.3.3). The most important exotic diseases in cattle are foot and mouth, rinderpest (out of scope of this study as a worldwide eradication campaign is currently underway), contagious bovine pleuropneumonia and bluetongue.

<sup>4</sup> Category 1 by-products represent the highest risk potential of disease if they enter the human or animal food chain.

<sup>5</sup> Information taken from the UK June Survey of Agriculture and Horticulture (Land Use, Livestock and Labour on Agricultural Holdings at 1 June 2008)



**Figure 8:** Maps showing the density (number per km<sup>2</sup>) of cattle, poultry, pigs and sheep in UK Census areas on the 1<sup>st</sup> June 2007. Dark colours denote areas of high population density and light colours represent areas with lower densities\*\*. Data obtained from June Agricultural Census 2007.



\*\*The white category represents those areas where data has been suppressed by the Census departments due to the area represented containing five or fewer holdings and therefore open to disclosure of information about individual holdings.

- **Sheep** in the UK are mainly farmed for meat, but they also produce wool and some milk. The structure of the UK sheep industry is complex and stratified. It produces 300,000 tonnes of meat (85% of which is eaten in the UK), 50,000 tonnes of wool (1% of the world's raw wool) and is the largest sheep industry in Europe. Everyone who keeps sheep must be registered with Government and all sheep must be identified by numbered tags in their ears. All batch movements of sheep must be reported to the local authority which enters the information into a Government system known as the Animal Movements Licensing System (AMLS) (see section 4.3.3). The most important exotic diseases which can infect sheep are foot and mouth disease, bluetongue, *Brucella melitensis* and *Mycoplasma agalactiae*.
- **Pigs** in the UK are used for producing pork, ham and bacon. Most pig farms are located on the eastern side of Scotland and England, because that is where most of the cereals for feeding pigs are grown. The pig industry is said to have a 'pyramid structure' because there are large numbers of commercial pig farms (which buy in and fatten pigs ready for slaughter) at the bottom of the pyramid and much smaller numbers of nucleus herds (which produce the purebred sows and boars for breeding stock) at the top. In the UK we produce approximately 0.7m tonnes of pig meat a year and import another 0.8m (particularly from Netherlands and Denmark). We export very little pig meat. Everyone who keeps pigs must be registered and all pigs over one year old which move from the farm, and all pigs under one year old going to the slaughterhouse must be identified (by a slapmark on the shoulders, an eartag or ear tattoo). Like sheep, batch movements of pigs must be reported to the Local Authority which enters the information onto AMLS (see section 4.3.3). The most important exotic diseases of pigs are foot and mouth disease, classical swine fever, Aujeszky's disease and African Swine Fever.
- In the UK, several species of **poultry** are reared in captivity to produce meat or eggs for human consumption, but by far the most common is the chicken. Other species include turkeys, ducks and geese and a small number of ostrich farms producing meat and feathers. In the laying hen industry there is an increasing trend away from birds being kept in cages and a move towards free range and barn systems. Birds reared for meat (broilers) are generally kept in very large groups indoors. Like the pig industry, the poultry industry is said also to have a 'pyramid' structure, with large numbers of commercial farms at the foot of the pyramid and much smaller numbers of specialist or 'grandparent' flocks (which produce birds for breeding) at the top. Since 2005, poultry keepers with more than 50 birds must register their premises with Government and the information is maintained in the GB Poultry Register. A detailed description of the poultry industry and the risks to its biosecurity can be found in the report – The Structure of the UK Poultry Industry: Commercial Poultry Sector, commissioned by Defra in June 2006 (see references). The most important exotic diseases of poultry are avian influenza and Newcastle disease.

Poultry keeping is also a popular hobby in the UK, where birds are kept for companionship, conservation, exhibiting and production of eggs for home consumption. Flock sizes in this sector can range from a single or pair of birds up to two thousand. Many of these birds are kept in facilities that allow contact with wild birds or their droppings. The breeding and movement of poultry in this sector is unregulated and consequently, with the large number of exhibitions and shows (held nearly every week) there can be a significant movement and mixing of these poultry around GB. Reputable breeders also legally import and export poultry both from/to the EU and third countries, and the possibility of illegal trade in this sector cannot be ruled out. More detailed information on this sector and its risks to biosecurity can be found in the report - the Structure of the UK Poultry Industry: Hobby and 'Fancy' Poultry Sector, commissioned by Defra in June 2006 (see references).

Other birds are also reared in the UK as **gamebirds** e.g. pheasants and partridges, for the shooting seasons in autumn and winter. Grouse are not held captive and are therefore officially considered to be wild birds, but they are recognised as part of the UK game industry. They are mainly found on heather moorlands across the majority of Scotland, the uplands and Pennines of Northern England and across Wales and Ireland. The Game

Conservatory Trust estimates that there are around 30 million game birds raised each year in the UK (roughly the same size as the commercial egg production flocks). The Game Farmers Association estimates that around 40% of the pheasants reared come from France either as eggs or day-old chicks, largely due to the competitive pricing of French stock. However, the maximum journey time of 12 hours for these birds makes much of GB out of range for many French game farms, limiting the source of this trade. More information on the structure of the game industry can be found in a report Defra recently commissioned from ADAS (The UK Game Industry – A Short Study, 2006).

- **Goats** are farmed in the UK for milk and some meat. They also produce hair (mohair and cashmere) and hide, and are used to graze rough land or kept as pets. There are approximately 96,000 goats in the UK, half of which are adult breeding animals. In England and Wales there are 30,000 milk-producing goats. Everyone who keeps a goat must be registered and all animals have to be identified by numbered tags fixed permanently to their ears and their movements are also reported to the local authority (see section 4.3.3). The most important exotic diseases which can infect goats are foot and mouth, goat pox, *Brucella melitensis* and *Mycoplasma agalactiae*.
- **Lamas, alpacas**, guanacos and vicunas are collectively known as New World **Camelids**. Originally they all came from Central America. Increasing numbers of alpaca and llama are being kept in the UK as pets and for business purposes. They live alongside other stock and make good companions, for example, for lone ponies. A number of enterprises in the UK offer lama treks. Their hair can be used to make garments and other products such as bags and rugs. There are no registration requirements for camelids at the moment in GB, although Defra has agreed with the camelid trade associations that this would be beneficial. This work is being taken forward under the auspices of Defra's new Livestock Information Strategy. Foot and mouth is arguably the most important exotic disease which can affect camelids.
- **Deer** in the UK are managed in different ways. They can be found in the wild (see section 3.4.8.3), kept in zoos or deer parks for ornamental purposes or venison production or farmed following conventional agricultural practices. Farmed deer are considered to be livestock. The most important exotic diseases which can infect deer are foot and mouth and bluetongue.

The different registration and identification requirements mean that some animal keepers have no requirement to register and so little is known about their activities or the level of risk they present e.g. camelids and poultry keepers with less than 50 birds. Other animal keepers are required to report movements but not stock numbers e.g. pigs and deer, leading to similar problems. Current legislation means that there tends to be a delay of at least 3 days before movements are reported by keepers (40-50% of movement reports incur this delay) and additional delays occur because paper forms have to be manually entered into the system. BCMS normally record movements onto the system within 48hrs of receipt of the paperwork. However, local authorities can take days to enter movement records. Experts have suggested that some local authorities are now failing to enter movements because of resource shortages.

#### 3.4.6.2 Livestock Movements

Each time livestock move from one location to another there is a risk of spreading disease. This risk can be greater when stock move into a breeding flock or herd; also when stock are brought together from many farms to a market or other central point before being dispersed to many different locations (Review of the Livestock Movement Controls, 2006). Table 12 shows the approximate number of animal movements which were reported in England and Wales in 2008.



**Table 12:** Number of individual animal movements in England and Wales in 2008<sup>6</sup>

Country	No of Cattle Movements	No of Sheep Movements	No of Pigs Movements
England	4 million	23 million	12 million
Wales	0.7 million	10 million	0.08 million

Moving stock, for example, from breeding and rearing farms to finishing units, from the hills to the lowlands, from rearing farms to sheep flocks, are all essential elements to a successful livestock industry. The pig and poultry industries have vertically integrated to great extent. The scope for the cattle and sheep industries to do so is more limited. It has happened to a degree in the dairy sector but even here calves and other stock often move to other farms for rearing and further finishing.

Before the outbreak of Foot and Mouth disease in February 2001, there were relatively few restrictions on the movements of livestock. Figure 9 shows the map of animal movements which had spread this disease in the 3 days between confirmation and a nationwide ban of animal movements being imposed. Within this 3 day period it is estimated that the disease had spread to a further 57 farms located in 16 different counties.

This outbreak showed that more needed to be done to prevent the outbreak of disease and to reduce its impact when an outbreak occurs. Livestock movement controls were initially put in place during the outbreak in June 2001. A 20 day standstill was imposed on all livestock, on the basis of scientific and veterinary advice that it both slowed down the spread of any disease present and improved the chances of detecting disease within a flock or herd before animals moved. Subsequently, the Government commissioned two independent inquiries into the 2001 FMD outbreak,



a Lessons Learned Inquiry chaired by Dr Iain Anderson and a scientific review by the Royal Society chaired by Sir Brian Follett. Both inquiries endorsed the retention of the 20 day standstill on disease control grounds until the Government had carried out a detailed risk assessment and wide-ranging cost-benefit analysis of the impact of different standstill periods.

On 1 August 2003 as a result of the findings from a risk assessment and cost-benefit analysis of standstill regimes, the Standing Movement Arrangements for England and Wales came into force (see section 4.3.2). Under the regime, whenever cattle and sheep are brought onto a

<sup>6</sup> Information provided by RADAR in February 2009

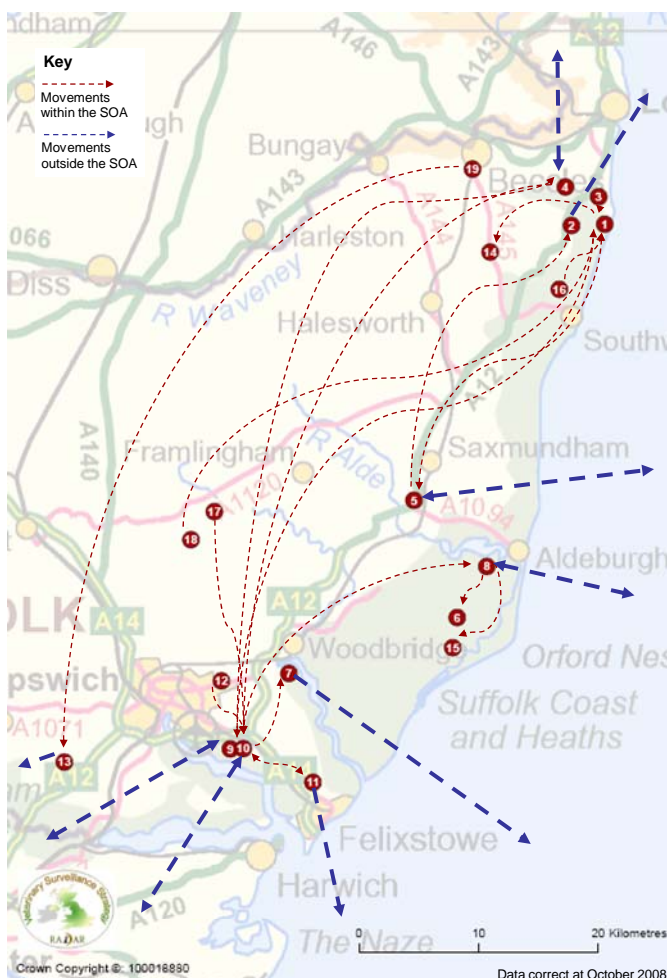
holding, no cattle or sheep may move off that holding for 6 days afterwards, unless the movement is one of those listed as an exemption (see the list of exemptions section 4.3.4). However, a group of premises within the same management and control may be granted a **Sole Occupancy Authority (SOA)**. When sheep, goat, pigs and cattle are brought onto any one of the premises within the SOA a standstill is imposed on all of them. However, they may move between premises in the SOA without observing the standstill. These movements must be recorded and reported. Cattle moves within a SOA do need to be reported unless there is also a CTS link<sup>7</sup>.

In November 2008, analysis of the information in AMLS<sup>8</sup>, showed that approximately 102,000 premises in England and Wales were part of a SOA, and there were approximately 29,000 SOAs in place. 16 of these SOAs connected more than 50 premises together. 1284 SOAs connected premises together over a distance of more than 30 miles.

Figure 10 shows a map representing the second largest SOA in England and Wales. This SOA was created in February 2008. There are approximately 90 'holdings' in this SOA, all holdings are in Suffolk, but only 19 have reported movements (shown on diagram) between February and October 2008.

In July 2008, the British Cattle Movement Service also undertook a review of the existing links in CTS involving holdings in England and Wales. It found that 8,170 locations in England and Wales shared 12,540 'links', between which cattle movements did not have to be reported. There were approximately 1.4million cattle present on these locations at the time of analysis.

Figure 10: Map of second largest SOA in England and Wales



### 3.4.6.3 Livestock Locations

Evidence provided to the Review of the Livestock Movement Controls by Bill Madders in 2006 also highlighted that for any movement reporting system to work, it is important to know where animals are moving between.

Common land, where animals from different herds can mix and graze freely provides an opportunity for the spread of disease. Most common land is now registered, however there are potentially a large number of keepers with 'links' in place to the same area of common land and it is difficult for any enforcer to know who has a registered right to graze any common because

<sup>7</sup> to mitigate the burden on industry, movements of cattle between "CTS linked holdings" do not need to be reported e.g. daily movements between grazing and milking parlours. However, keepers must record the movements between linked holdings in their herd farm records (except for movements daily between shared milking parlours).

<sup>8</sup> Information supplied by RADAR in November 2008

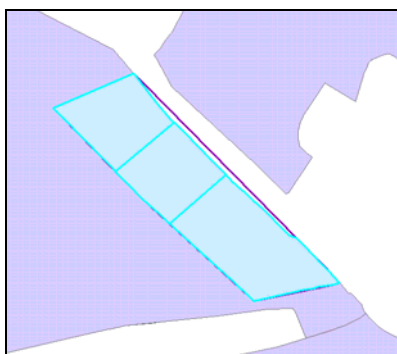
the rights are registered at district council level, not county council level. This difficulty is compounded further when a common lies across the boundary of two or more districts. On the commons, the animals will mix and roam over large areas, whilst according to central Government records they remain registered against their keepers main holding on CTS. Despite this, some experts expressed opinions that the low stocking densities found on these unenclosed areas of rough grazing mean that disease transmission is low risk.

The system of identifiers used for main livestock holdings throughout GB originated in the 1940s, and allocated, for each country and each parish within that country, a holding number to each farm. This is the farm's CPH number. The structure of the agriculture industry has changed since the 1940s, but the CPH number structure has not kept pace. Many farming businesses occupy several parcels of land at a distance from each other. In England the allocation of CPHs is the responsibility of RPA and in Wales this is undertaken by WAG Rural Payments Division. Their rules state that, where a business has two parcels of land that are less than ten miles apart these can be included within a single CPH. If the two parcels are more than ten miles apart they must be given separate CPHs. However, with the pressure to simplify the previous subsidy payment arrangements it is clear that these rules have not been universally applied. Experts have suggested that movements of livestock between parcels of land owned by the same business tend not to be reported and that over time there has been increasing fragmentation of the land parcels owned by a single business.

Table 13 demonstrates the results of an analysis<sup>9</sup> of the land parcels associated with approximately 133,000 CPHs in England and Wales. A Fragmentation Index was calculated for each CPH, with 0 representing no geographical fragmentation (only one land parcel associated with a CPH) and 100 representing the most geographical fragmentation i.e. more land parcels scattered further apart. For example:

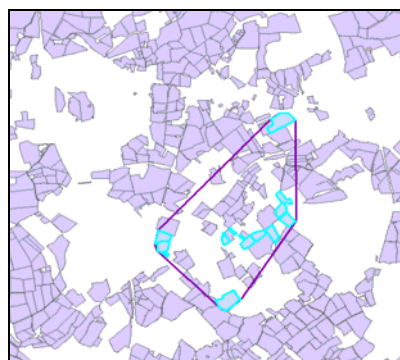
**CPH Fragmentation Index = 5**

The area of the parcels as a percentage of the area of the minimum bounding polygon is 95%, hence the low fragmentation index of 5%. The land parcels are tightly clustered together.



**CPH Fragmentation Index = 90**

The area of the parcels as a percentage of the area of the minimum bounding polygon is almost 10%, hence the fragmentation index of 90%.



A 'diagonal dispersal' was also calculated for each CPH as the maximum diagonal distance between two land parcels associated with the CPH number. The count in each cell of table 13 represents the number of CPHs falling into each category. For CPHs in the 0-3 km dispersal band the tendency is for the level of fragmentation to be low as might be expected. This trend makes an abrupt reversal in the 3-10 km dispersal band where a high level of fragmentation becomes the norm. Approximately 50% of farms fall within the cells highlighted orange and have a few land parcels scattered over a distance of less than 3km. 25% of farms fall within the cells highlighted in yellow, and show a high level of fragmentation over a distances of 3-30km.

<sup>9</sup> We are grateful to Infoterra for performing this fragmentation analysis of the Rural Land Registers for us

A small minority of CPH numbers, the 2% highlighted in blue, have land parcels scattered over distances of between 30-800km.

**Table 13:** Fragmentation of land parcels on 133,000 CPHs in England and Wales

		Fragmentation Index									
		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	80-100
Diagonal Dispersal	0-3km	12,910	14,735	15,605	13,141	9,656	7,525	6,169	4,970	3,299	889
	3-10km	19	175	568	965	1,457	2,087	3,202	5,105	8,684	8,414
	10-20km		1	4	4	14	18	51	159	1,180	6,677
	20-30km						1	2	5	49	2,352
	30-40km									7	965
	40-50km									2	572
	50-60km										319
	60-70km										207
	70-80km										125
	80-90km										107
	90-100km										102
	100-200km										365
	200-300km										138
	300-400km										73
	400-500km										32
	500-600km										7
	600-700km										3
	700-800km										3
	% of CPHs per fragmentation index category		10%	11%	12%	11%	8%	7%	7%	8%	10%

Further evidence provided to the Madders Review also demonstrated that some keepers have obtained multiple CPHs, which are routinely used to circumvent the movement standstill rules. One keeper admitted to having six CPHs, effectively one for each day of the week. Those CPHs are not necessarily on an identical piece of land but they are on land that is epidemiologically linked. Because these CPHs are unlikely to be linked on AMLS, stock is effectively moving on and off this keepers' premises on a continuous basis. It is not known how widespread this practice is, but it seems to be used by some at least of those who deal in livestock or who act as purchasing agents on behalf of others. This practice increases disease risk, because diseased animals bought onto a dealers or traders premises, would spread disease to other livestock that are moved off, without the standstill delay during which disease could become evident.

During interviews experts suggested that the main driver for reducing the spread of disease is the standstill requirements not the registration requirements. It was further suggested that standstill rules were still effective even if the level of non-compliance reaches 40%. The purpose of standstill controls is to limit the 'silent spread' stage of a virus outbreak, i.e. before the first case is definitely confirmed and emergency contingency measures such as a national movement ban, animal culling etc. are implemented. Evidence from modelling (Risk Solutions, 2003) suggests that standstill regimes do help to limit disease spread during the silent spread period, but the impact of the controls is diluted by the fact that they operate most effectively on onward movements from premises where infection has arrived via a livestock movement that triggers a standstill. In many runs of the risk solutions model much of the early geographical dispersion of the disease occurs through livestock movements away from premises infected by other mechanisms, such as airborne plume of virus that can be generated from a pig farm it is the first to be infected (the index farm). These movements are not directly addressed by standstill controls. Further runs of the model also suggested that time to detection is a more



critical factor than the length of standstill. Measures to reduce time to detection would bring more benefit than longer standstill controls, and therefore, it is important that the cost-benefit of standstills is considered in light of other possible strategies. The aim must be to facilitate the necessary economic activities of the livestock industry, including the movement of stock, while mitigating the risk of disease spread.

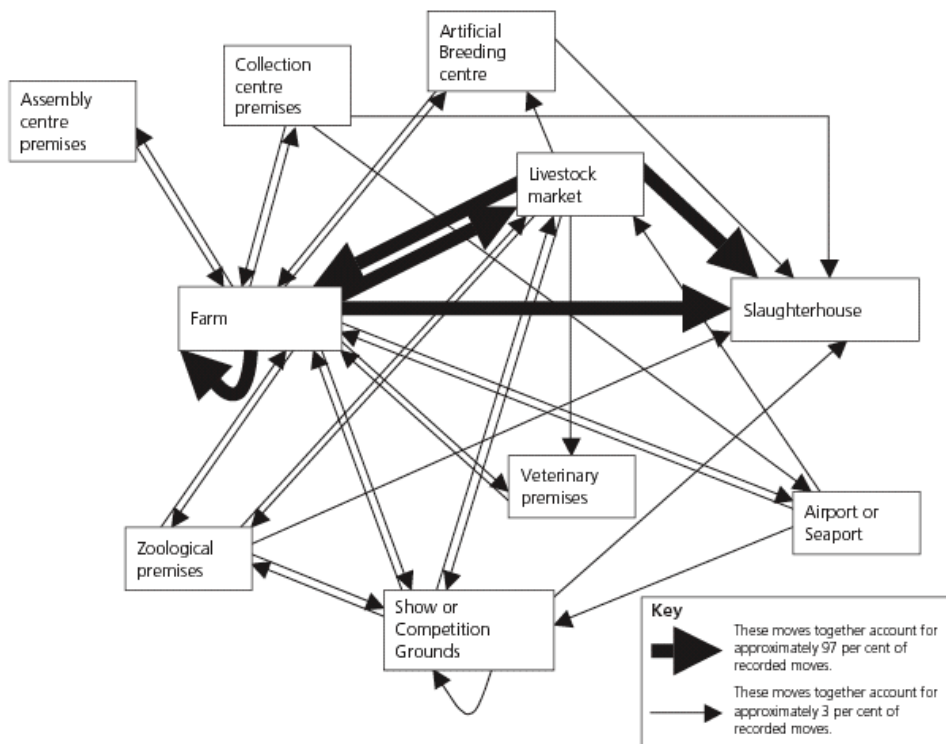
### 3.4.6.4 Markets and Animal Gatherings

For diseases linked to livestock, markets have particularly important role in the dissemination of infectious organisms. They serve as contact nodes between infected herds and the ease of transportation can result in the widespread dissemination of animals that have been in contact in a market throughout GB. There are currently over 150 livestock markets in GB (see table 14).

**Table 14:** Number of livestock markets in Great Britain, 2008 (source: Livestock Auctioneers Association and Institute of Auctioneers and Appraisers, Scotland)

	Number of Livestock Markets
England	87
Scotland	33
Wales	38

In 2003, the Animal Health and Welfare Strategy for Great Britain, reviewed the types of sheep and pig movements in England and Wales recorded on AMLS (see figures 11 and 12). How often and how far livestock move is different for each species. The vast number of sheep movements through livestock markets in GB is a major risk factor for the spread of disease, as evidenced by the Foot and Mouth Outbreak in 2001.

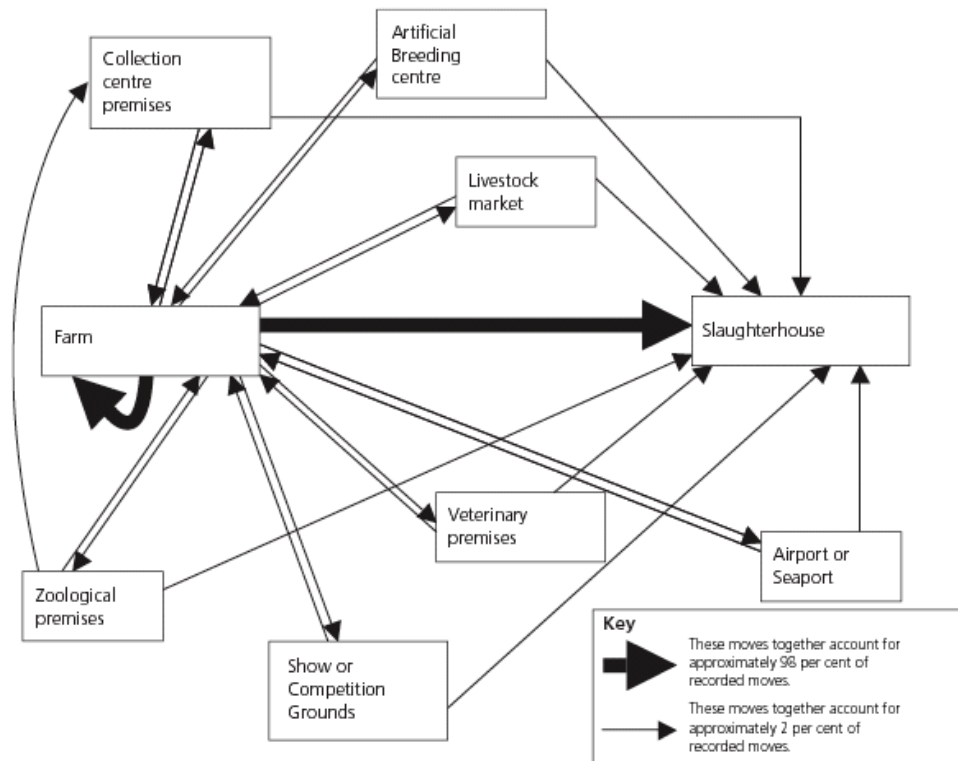


**Figure 11:**

**Direction and types of 17.6 million sheep movements recorded on the AMLS in England and Wales in 2003. Most movements (other than those to slaughterhouses) are from farm to farm (4.2 million), farm to livestock market (9.1 million) or livestock market to farm (2.7 million).**

**Figure 12:**

**Direction and types of 11.8 million pig movements recorded on the AMLS in England and Wales in 2003.** Most of the movements were from farm to slaughterhouse (6.7 million) or from farm to farm (4.9 million).



Other contact points such as quarantine facilities and ports of entry, or any occasion at which animals are brought together for a sale, show or exhibition, collection for onward consignment can also result in the transmission of agents between different species, with rapid subsequent dissemination. For this reason, all animal gatherings must be licensed by Animal Health and follow strict biosecurity guidance (see section 4.3.2)

### **3.4.7 Contact between livestock, competent vectors and susceptible wildlife e.g. wild boar, wild birds, semi feral equines, wild deer**

Wild animals can be reservoirs of OIE listed diseases as well as other important diseases that can affect domestic animals or humans (England Wildlife Health Strategy, 2009). Deer, foxes, wild boar, wild birds, rodents and insects can all be carriers or reservoirs of important exotic diseases that affect other animals (see table 15). Sometimes an outbreak of disease in wild animals may be the first sign that an unusual disease has got in to the country.

Some exotic diseases which can infect wildlife and insect vectors can spread to farm animals where contact between the two occurs. For example, at a water source that kept poultry share with wild birds, or a feed manger that also happens to be home to a family of mice. There are three main areas targeted as on-farm wildlife biosecurity concerns:

- feed (particularly feed storage)
- water sources
- and the living space for the herd

Defra advises animal keepers to reduce the risk of livestock exposure to wildlife or other disease vectors by regular maintenance of feed storage areas, watering systems, and animal

facilities. The Veterinary Laboratories Agency produces an annual report on wildlife diseases in the UK (see VLA pages on Defra Website).

We do not know exactly how many wild animals there are in GB, but the risks posed by some important wildlife populations are described in the following sections.

### 3.4.7.1 Wild Birds

Wild birds share with humans the capacity for moving fast over large distances. During migratory movements (see figure 13 for an example), birds can carry pathogens that can be transmitted between species at breeding, wintering, and stopover places where birds of various species are concentrated.

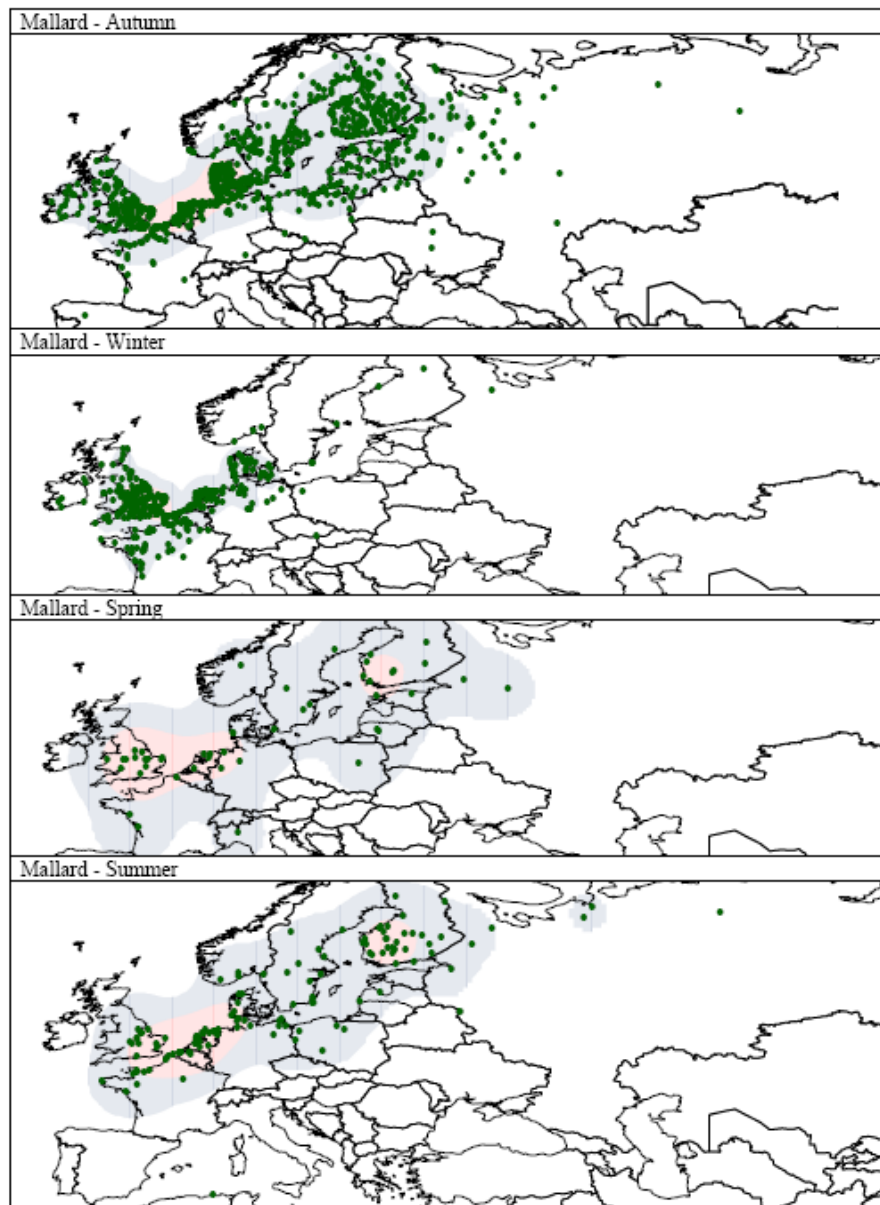
**Figure 13:** Seasonal distribution maps of the Mallard (*Anas platyrhynchos*)

Mallard are the most widespread duck in Britain. Apart from resident birds, numbers are swelled by migrants from continental Europe in winter. The birds are from north-west Europe, including southern Norway, Sweden and Finland to western Russia and south to Poland, Germany, the Low Countries and northern France (summer distribution maps).

Most recoveries are from the autumn and reflect the summer distribution as birds move into their winter quarters. In winter, birds ringed or found in Britain are generally from a limited area stretching from the Low Countries through to the Atlantic coast of France.

A series of four seasonal maps are presented, divided up as follows: Winter (December, January, February), Spring (March, April), Summer (May, June and July) and Autumn (August, September, October & November). For these, the location of every recovery is shown as well as a kernel representing 95% of these points where appropriate (blue shading) and a kernel representing 50% of the points (red shading). For maps which have few recoveries the 95% kernel will inevitably cover the majority of the points and may well include outliers. Interpretation using expert opinion is therefore extremely important in these cases.

Taken from BTO Research Report 448 - Avian Influenza Inursion Analysis (through wild birds) 2006



For instance, birds are believed to be responsible for the wide geographic distribution of exotic diseases such as West Nile, Avian Influenza and Newcastle Disease (Jourdain *et al*, 2007).

H5N1 is a particular strain of Highly Pathogenic Avian Influenza (HPAI) which has been causing worldwide concern in recent years and resulted in the death of more than 150 million poultry

worldwide, through infection or attempts to control its spread (Crick *et al*, 2006). In recent years GB has experienced and controlled several incursions of Avian Influenza and one possible route by which it can be introduced into GB is through migratory wild birds carrying infection in from Europe or Asia. Since 2005, when outbreaks of HPAI were first found in Europe, Defra has sought the advice of an ornithological expert group, with the aim of assessing the relative risk of HPAI introduction to domestic poultry from wild bird movements to GB.

Surveillance for avian influenza viruses in domestic poultry and wild birds is part of a European initiative and is carried out in all European MS. Defra carries out an annual survey for avian influenza in the wild bird population. There are an extremely large number of wild birds in GB so it is therefore only practical to sample a small percentage of these. Certain species of wild birds that experts believe to have a greater potential role in the spread of avian influenza viruses (e.g. gulls, ducks, geese, swans and waders) are central to the survey and **scientific methodology is used to choose high priority survey areas** (see figure 14 and **BTO research report available at the British Trust for Ornithology website**).

Defra also examines dead birds for West Nile virus which is carried by mosquitos, but so far has not found the virus.

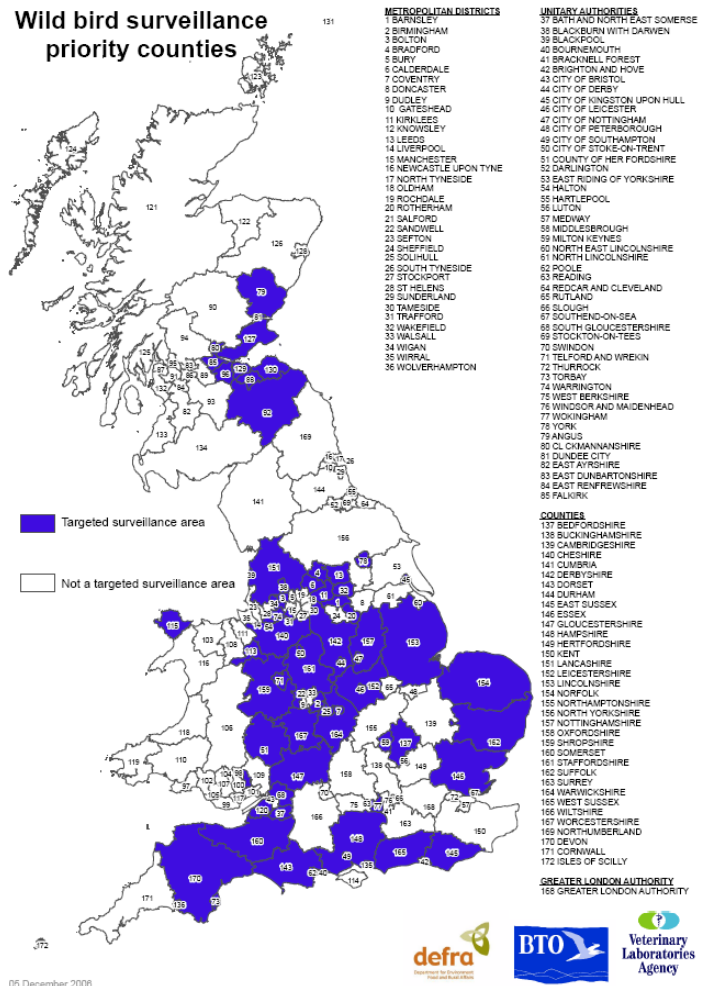
### 3.4.7.2 Wild Boar

Wild boar, *Sus Scrofa* is an ancestor of the domestic pig, with which it can freely hybridise. They were once native in Britain but driven to extinction at least 300 years ago through over hunting, cross breeding with free-range domestic pigs and habitat loss. Feral breeding populations have recently been re-established through illegal releases and/or escapes of farmed stock.

The English feral boar population is estimated at no more than around 500 in the established populations, and fewer than 1000 in total. There are three established feral breeding populations of feral wild boar in England (see figure 15):

- The largest, in Kent/Sussex was estimated in 2004 at approximately 200 animals in the core distribution area;
- The second largest in the Forest of Dean/Ross on Wye area, where there may be in excess of 50 animals;
- The smallest is in west Dorset, where there are still believed to be fewer than 50 animals.

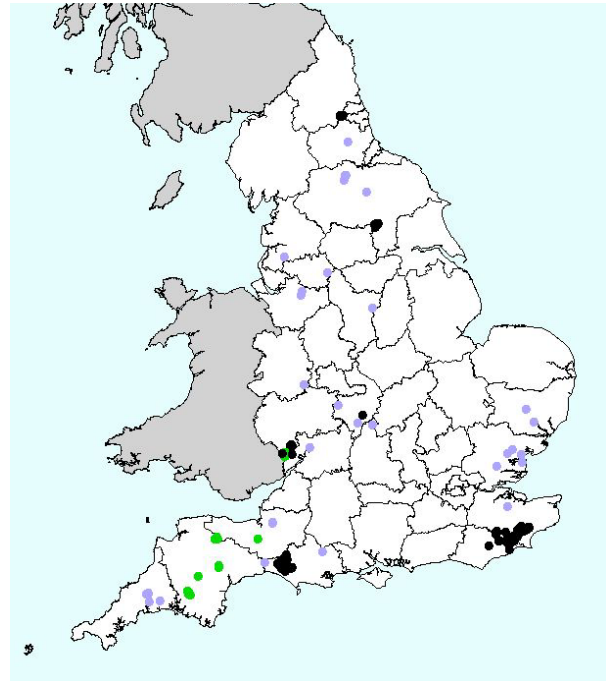
**Figure 14: Wild bird surveillance priority counties in GB**





**Figure 15:** Distribution of reports of feral pigs/free-ranging wild boar in England from 1980 to June 2006. (Reproduced from Update Report on Distribution and Status of Feral Wild Boar in England, C J Wilson, National Wildlife Management Team, Rural Development Service. August 2006)

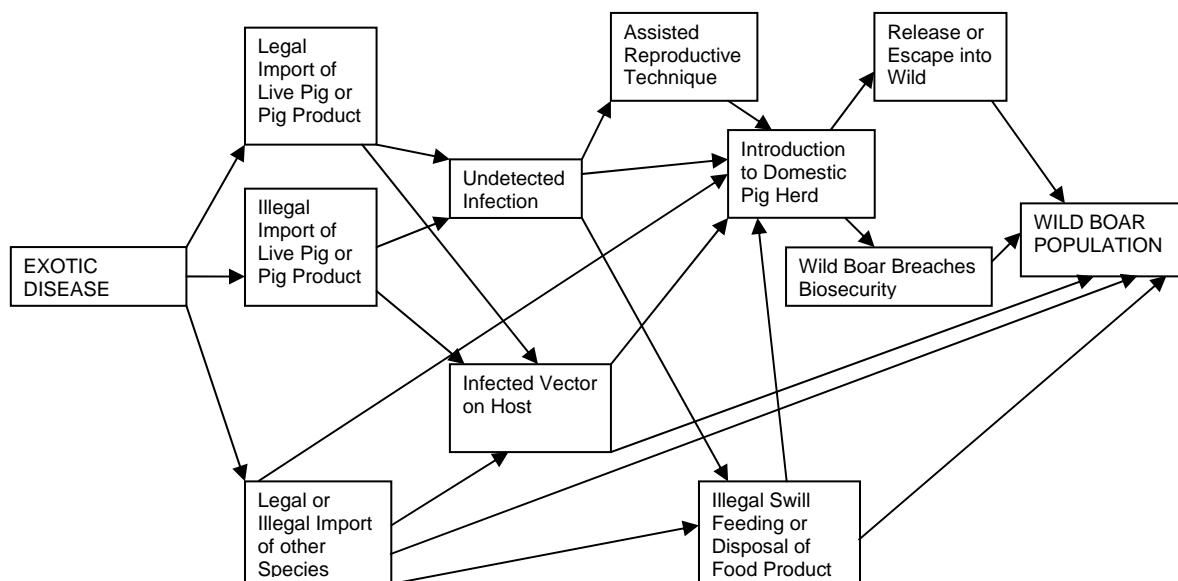
The black dots indicate animals possibly still present at the end of each reporting period (there is some doubt about those in Yorkshire and Tyne & Wear still being present; green dots show records where animals believed possibly still present but associated with new releases/escapes since the beginning of 2003; pale blue dots show areas where animals believed no longer present.



Since winter 2005-2006 a significant number of escapes/releases have resulted in animals colonising areas around the fringes of Dartmoor and evidence of breeding in the wild has been recorded. These are considered as an additional single new breeding population and it is currently estimated that there are up to 50 animals in this population. There have also been further release incidents in Devon in 2007.

According to a veterinary risk assessment published in August 2007, free-ranging boar will be attracted into outdoor domestic pig holdings by the available food, social interaction and reproductive behaviour. Current pig fencing is unlikely to deter a determined wild boar. This interaction is of particular concern as diseases may be transmitted in either direction. Biosecurity measures and effective exclusion are essential. This will be increasingly important as the number of outdoor pig herds increase. Figure 16 demonstrates potential disease incursion pathways into the wild boar population and the current control points in these pathways.

**Figure 16:** Simplified risk pathway for incursion of exotic diseases into the free-ranging wild boar population in England (taken from wild boar veterinary risk assessment, August 2007)



In February 2008, Defra launched the first policy and action plan to help local communities manage feral wild boar populations where they live. Two risk assessments were also published

at the same time concluded that feral wild boar do not pose a national threat to the environment, farming or public safety. These are available on the Defra website.

### 3.4.7.3 Semi feral equines

There are still semi-feral groups of ponies grazing on areas such as the New Forest and Dartmoor in GB. A "semi-feral breed" means a breed of horse registered with one of the following recognised organisations-

- the Dales Pony Society;
- the Dartmoor Pony Society;
- the Exmoor Pony Society;
- the Fell Pony Society;
- the New Forest Pony Breeding and Cattle Society;
- the Eriskay Pony Society;
- the Highland Pony Society;
- the Shetland Pony Society; or
- the Welsh Pony and Cob Society

Most of these animals are grazed on common land under multiple ownership. Semi-feral horses currently require a passport, except for the ponies on Dartmoor and in the New Forest which only need a passport when they move from these areas (Exmoor will also be added to this list of designated areas shortly when the new Statutory Instrument comes into force). The New Forest Verderers and the Dartmoor Commoners Council have detailed agreements with Defra and are obliged to maintain a list of all such horses and ponies which includes individual identification and all other details as required for the issue of a horse passport. Some experts believe that the lack of financial value for these animals means that injured or sick animals may be less likely to be treated.

### 3.4.7.4 Wild Deer

There are six different species of wild deer in GB. The roe deer is a native species and estimates suggest a British population of around 500,000-600,000. The red deer is Britain's largest native land mammal. The Scottish herd of red deer is estimated to be in the region of 300,000 (no statistics are available for England and Wales). The fallow deer was introduced to Britain but has become wild through accidental and deliberate release of park deer. Current estimates put their population size at around 100,000. Sika deer and Muntjac deer have also been introduced in the last two hundred years and their numbers are increasing. The Chinese water deer is an introduced species with limited distribution, but is endangered in its native region and so the GB population could be important to conserving the species.

Foot and Mouth and bluetongue are important exotic diseases which can infect deer. Red deer, fallow deer, muntjac and roe deer are all potential hosts of the Bluetongue virus and in experimental inoculations all four species developed a period of infection, with multiplication and shedding of the virus but none developed severe disease<sup>10</sup>. Bluetongue has not yet been reported in wild deer in Europe.

### 3.4.7.5 Arthropod vectors

In epidemiological terms, a vector is an organism that does not cause disease itself but rather, transmits infection by conveying pathogens from one host to another. A classic example in

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<sup>10</sup> Published briefing from Peter Green, Veterinary Advisor, The British Deer Society. Available at British Deer Society Website: <http://www.bds.org.uk>

humans is the anopheles mosquito, which acts as a vector for the disease malaria by transmitting the parasite plasmodium to humans. In this case the plasmodium is harmless to the mosquito (its intermediate host) but causes the disease malaria in humans (its definitive host). In a similar way, many exotic animal diseases are also spread by vectors e.g. African Horse Sickness, West Nile Virus, Bluetongue.

For the purposes of this study, vectors are considered to be arthropods (insects), which can carry disease-causing pathogens from one animal host to the next. Arthropods account for over 85 percent of all known animal species. Several genera of arthropods play a role in animal disease, but mosquitoes, midges and ticks are arguably the most notable. The most significant mode of vector-borne disease transmission is by blood-feeding arthropods. The pathogen multiplies within the arthropod vector, and the pathogen is transmitted when the arthropod takes a blood meal. However, mechanical transmission of disease agents may also occur when arthropods physically carry pathogens from one place or host to another, usually on body parts.

The different stages of a pathogen's life cycle are intimately dependent upon the availability of suitable vectors and hosts. Key components that determine the occurrence of vector-borne diseases include:

- the abundance of vectors and hosts;
- the prevalence of disease-causing pathogens
- the local environmental conditions, especially temperature and humidity; and
- the resilience behaviour and immune status of the animal population.

Vector-borne exotic animal diseases are prevalent in the tropics and subtropics and are relatively rare in temperate zones. However, global warming, extreme climate change, changing physical distribution, and an increase in overseas travel are also expected to influence the distribution and spread of vector-borne infectious diseases (Kobayashi et al, 2008). For example, until recently Bluetongue had only been recorded in southern regions of the EU including parts of Italy, Spain, France and Portugal. In August 2006 several Northern European countries reported the first ever outbreaks of Bluetongue, including in Holland, Belgium, Germany and France. Further outbreaks were reported in 2007 and 2008 including in the UK and Sweden.

EFSA has stressed the need to carry out surveillance of vectors not only for Bluetongue but also for other possible emerging animal diseases. It has launched a collaborative project on three such diseases which will include the evaluation of the distribution of arthropod vectors in the EU and their potential role in transmitting exotic or emerging vector-borne diseases and zoonoses. This report should be available in 2009.

During interviews and workshops, experts also expressed concerns about human activity which can inadvertently create aquatic breeding sites for arthropod vectors. For example, accumulation of rain water in stacks of old tyres or changes in human water-storage practices that are being driven by reduced rainfall. Mosquitoes lay their eggs in still water, and much of the mosquito's favoured breeding habitat is inadvertently provided by humans in the form of rainwater tanks and other open water containers. Simple changes such as reducing or covering such tanks could possibly counteract some of the climate change-driven habitat expansion.

### **3.5 Which exotic diseases can exploit the pathways of highest risk?**

Table 15 identifies which of the exotic diseases in scope can exploit the priority risk pathways identified, i.e.:

- (Commercial or Personal) Imports of livestock, meat and germplasm – particularly illegal imports from 3<sup>rd</sup> countries. Imports from EU were an 'unknown' but likely high risk.

- Importation of laboratory or pharmaceutical material for diagnostic or research purposes in GB – particularly as illegal personal imports or via parcels and post (inc. bioterrorism)
- Vehicles from abroad which have been carrying animals or are capable of carrying competent vectors e.g. pools of stagnant water in old car tyres
- Importation and movement of horses around GB
- Food waste from retail and food processing industry
- Migration of wild birds
- Movement of livestock around GB (between farms, markets and other gatherings)
- Contact between livestock, competent vectors and susceptible wildlife populations/reservoirs e.g wild boar, wild birds inc. grouse moor, semi feral equines

The final row of this table calculates how many of the exotic diseases in scope can exploit each pathway. This information is used in chapter 6 to support the project's assessment of the level of resilience for each of the priority pathways.

**Table 15:** Notifiable exotic diseases and priority risk pathways

Exotic Disease	Which diseases can exploit these high risk pathways?										
	Imports of Livestock or Pets (excludes horses)	Imports of Meat	Imports of Germplasm	Imports of laboratory material	Livestock transport vehicles from abroad	Importation & Movement of Horses	Waste from Retail / Food Processing	Migration of Wild Birds	Movement of Livestock around GB	Contact between livestock & wildlife in GB	Contact between livestock & competent insect vectors in GB
African Horse Sickness	X	X	X	Yes	X	Yes	X	X	X	X	Midges
African Swine Fever	Yes	Yes	X	Yes	Yes	X	Yes	X	Yes	Wild Boar	Ticks
Aujeszky's	Yes	X	Yes	X	X	X	X	X	Yes	Wild Boar	X
Avian Influenza	Yes	Yes	X	Yes	Yes	X	Yes	Yes	Yes	Wild Birds	X
Bluetongue	Yes	X	Yes	X	Yes	X	X	X	Yes	Deer	Midges
Brucellosis (Brucella abortus)	Yes	X	Yes	Yes	Yes	X	X	x	Yes	X	X
Brucellosis (Brucella melitensis)	Yes	X	Yes	Yes	Yes	X	X	X	Yes	X	X
Classical Swine Fever	Yes	Yes	Yes	Yes	Yes	X	Yes	X	Yes	Wild Boar	X
Equine Viral Encephalomyelitis	X	X	X	X	X	Yes	X	Yes	X	Wild Birds	Mosquitoes
Equine Infectious Anaemia	X	X	Yes	Yes	X	Yes	X	X	X	X	Biting Flies (mechanical)
Foot and Mouth Disease	Yes	Yes	Yes	Yes	Yes	Yes (mechanical)	Yes	X	Yes	Wild Boar	X
Glanders	X	X	X	Yes	X	Yes	X	X	X	X	X
Newcastle Disease	Yes	Yes	X	Yes	Yes	X	Yes	Yes	Yes	Wild birds	X
Pest des Petits Ruminants	Yes	X	X	Yes	Yes	X	X	X	Yes	X	X
Rabies	Yes	X	X	X	X	X	X	X	X	Foxes	X
Rift Valley Fever	Yes	X	Yes	X	Yes	X	X	X	Yes	Wild Mammals	Mosquitoes
Sheep & Goat pox	Yes	X	X	Yes	Yes	X	X	X	Yes	X	X
Swine Vesicular Disease	Yes	Yes	Yes	Yes	Yes	Yes (mechanical)	Yes	X	Yes	Wild boar	X
Vesicular Stomatitis	Yes	Yes	X	X	Yes	Yes	Yes	X	Yes	Wild Mammals	X
West Nile Virus	X	X	X	X	X	X (Dead-end host)	X	Yes	X	Wild birds	Mosquitoes
<b>No. of Diseases</b>	<b>15</b>	<b>7</b>	<b>9</b>	<b>13</b>	<b>13</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>14</b>	<b>13</b>	<b>7</b>

## 4 Review of Existing Controls and the Delivery Landscape

### 4.1 The Delivery Partners

The framework for the control and mitigation of exotic animal disease involves a number of different delivery partners. Below is a list of the primary delivery agents involved and a brief description of their role.

- **Local Authorities** – inspection and enforcement at food/animal product BIPs, farms, at markets and roadside checks, and of fallen stock disposal rules
- **Animal Health** – issuing licensing and approvals, serving restrictions, and undertaking veterinary investigations into suspicion of exotic disease including post import testing of livestock
- **Meat Hygiene Service** (part of Food Standards Agency) – inspection of abattoirs and slaughterhouses
- **British Cattle Movements Service** (part of Rural Payments Agency) – cattle tracing and identification
- **Veterinary Medicines Directorate** – ensuring responsible, safe and effective use of veterinary medicinal products
- **Veterinary Laboratory Agency** – research, consultancy, diagnosis and surveillance of livestock disease
- **Port Health Authorities** – inspection and enforcement at ports
- **HMRC / UK Border Agency** – anti-smuggling controls measure at the GB border to target illegal imports
- **Health & Safety Executive** – inspection of containment measures at facilities in England deliberately working with animal pathogens and investigation of any loss of containment
- **Health Protection Agency** – collection, collation, analysis and interpretation of information to identify and monitor the prevalence of infectious human diseases, including zoonoses for which HPA undertakes surveillance
- **Environment Agency** – environmental permitting for the disposal of agricultural waste, including manure, slurry, and clinical waste

A number of other key groups are also involved in reducing the risk and spread of exotic disease, including animal keepers, other EU Member States, farm assurance schemes, NGOs and wildlife organisations (particularly in surveillance), the RSPCA and the police – who assist Local Authorities in enforcing roadside checks. As well as the vigilance and conscientious of the general public.

### 4.2 Roles and Responsibilities

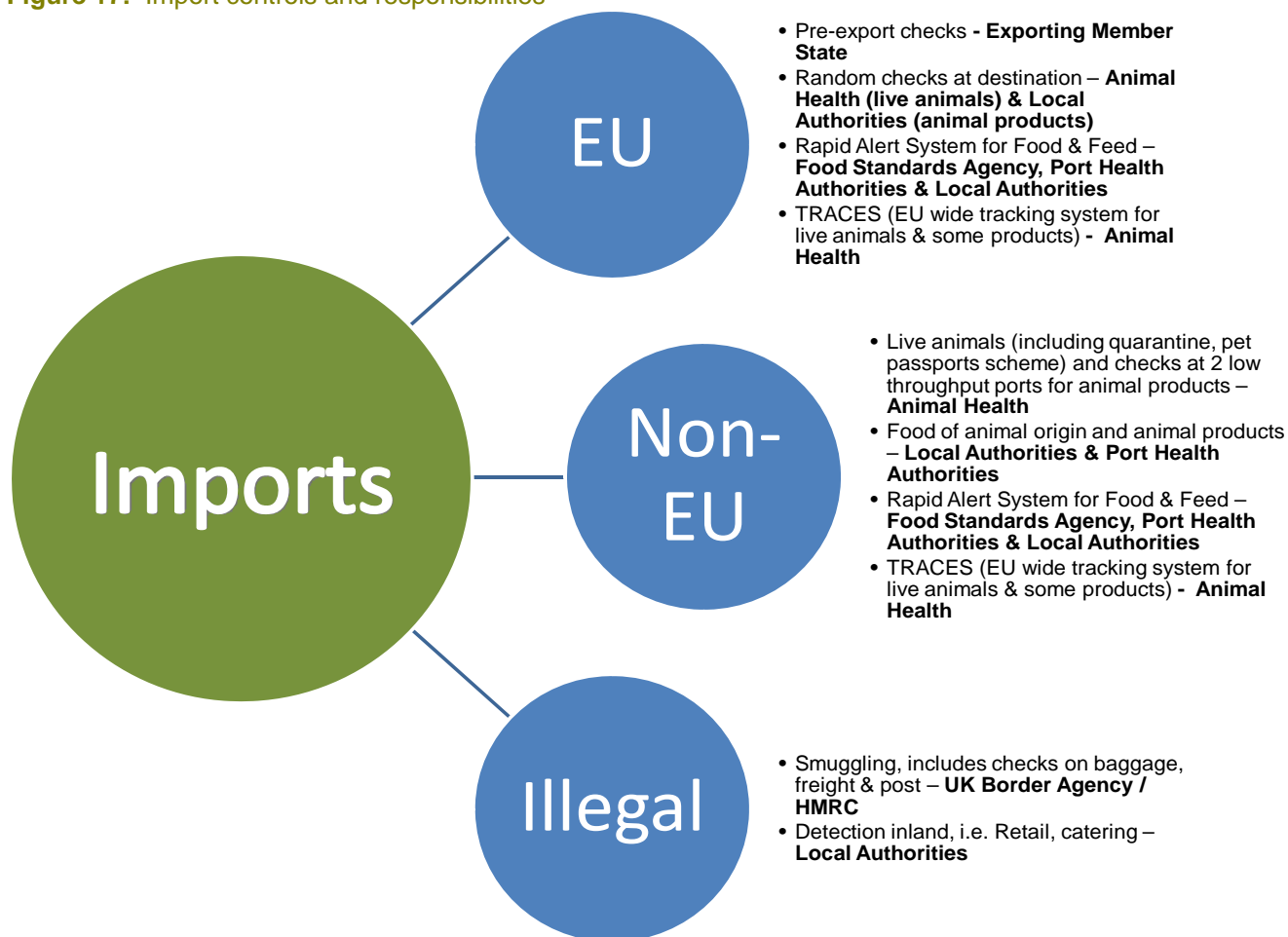
The split in responsibilities to reduce the risk of an animal disease outbreak is complex and the delivery partners involved have different roles and powers to enforce. These roles and responsibilities include:

- enforcing inspection controls to reduce the risk of an exotic disease entering GB; and
- licensing, inspection and reporting controls to prevent the rapid spread of an exotic disease once it has arrived.

### 4.2.1 Preventing the Introduction of an Exotic Disease

Figure 17 identifies the roles and responsibilities of Defra’s delivery partners for checking and enforcing import controls at the GB border in order to prevent the introduction of an exotic disease. Responsibilities are split depending on whether the import is legal or illegal, from an EU Member State or a Third Country, is a live animal, an animal product or food of animal origin. These factors also dictate what checks are carried out and when.

**Figure 17: Import controls and responsibilities**



### 4.2.2 Preventing the Rapid Spread of an Exotic Disease

Internally there are a number of potential destinations for animals and animal products which are regulated by Defra’s delivery partners to control and mitigate the rapid spread of an exotic animal disease. Responsibilities for licensing and inspection are split between a number of enforcement bodies depending on the type of premises. The premises identified as being on potential high risk exotic disease pathways are shown in figure 18.

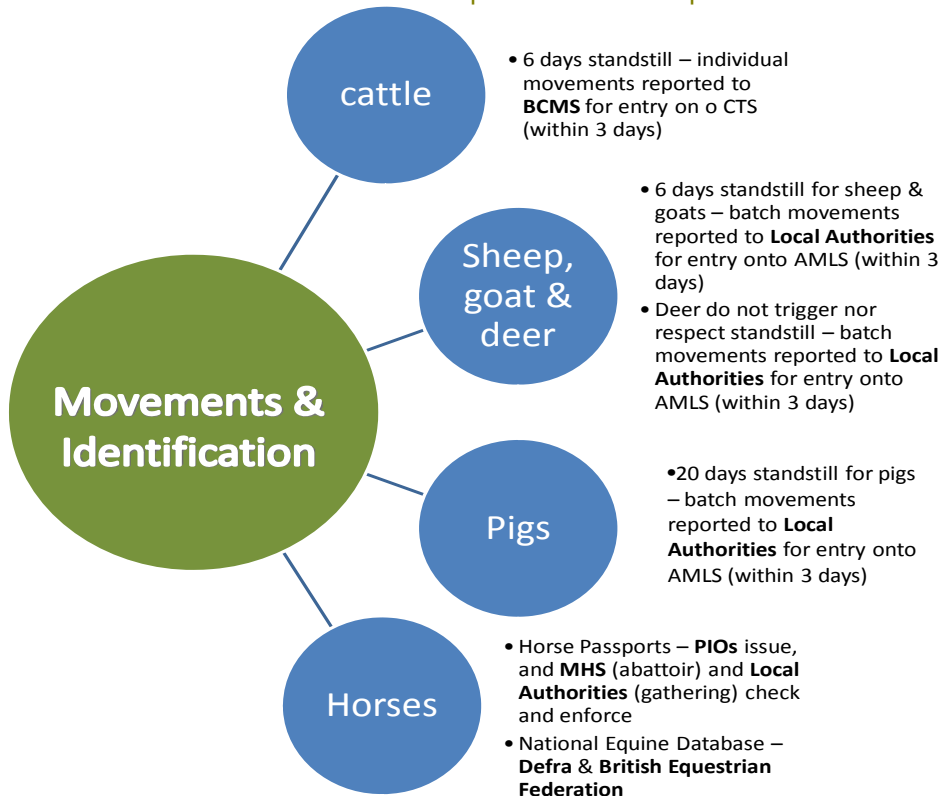
As well as controls on premises that handle animals and animal products, the movements and identification of certain animals must be reported and certain restrictions (‘standstill’) apply. An overview of these standstill restrictions and the responsibilities of the delivery partners is shown in figure 19.



**Figure 18:** Licensing and inspection responsibilities for high risk premises



**Figure 19:** Movement controls and identification requirements and responsibilities



The main objective to controlling animal movements is to reduce the risk of outbreaks and to have quicker control of outbreaks when they do occur. However, there are a number of exemptions to the restrictions outlined above, which will be covered in the next section on existing controls.

### 4.3 Existing Controls

Given the number of delivery partners involved in managing the risk of exotic animal disease it is not surprising that the legislative framework is also complex. The principle regulations which apply to the importation, holding and movement of animals and animal products are outlined below.

#### 4.3.1 Imports

##### EU

The importation of live animals and animal products from a Member State is subject to harmonised EU trade rules, which are implemented by the **Animals and Animal Products (Import and Export) (England) Regulations 2006**. All consignments must be accompanied by an export health certificate, signed by an Official Veterinarian, confirming that it meets the requirements for intra Community trade. Checks on the certification are carried out at a Border Inspection Post (BIP) on entry to UK, by either Animal Health (live animals) or Local Authorities / Port Health Authorities (animal products). Random veterinary checks may be carried out at the point of destination to ensure that the requirements are met. Where necessary, as a result of a disease outbreak in another EU Member State, restrictions may be put in place on the importation of live animals or animal products although the onus is on the exporting country to implement disease control measures.

##### Non-EU

The **Products of Animal Origin (Third Country Imports) (England) Regulations 2006** is the principle regulation relating to imports of animal products from outside the EU. It lays down the principles governing the organisation of veterinary checks on products entering England from third countries and measures for imports of animal products for personal consumption. Legally imported animals and animal products from non-EU countries are checked at BIPs on entry to the UK. As with EU imports Animal Health are responsible for checks on live animal imports and Local Authorities / Port Health Authorities are responsible for checks on animal products. There are three types of checks for non-EU imports:

- Documentary checks – as with EU imports the certification accompanying all consignments is checked;
- Identity checks – all consignments are checked to ensure that they match the information given in the document;
- Physical checks – checks on the consignment itself, including checks on temperature, condition, and for microbiological and chemical contaminants. Not all consignments are subject to physical checks. The level of checks will depend on the category of the consignment, e.g. for category I products not less than 20% of consignments must undergo physical checks.

There are also 'equivalence agreements' with certain Third countries - Canada, New Zealand and Switzerland - that sets the levels of such checks for products from these countries.

##### Illegal

The **Customs and Exercise Management Act 1979** provides HMRC and the UK Border Agency with wide-ranging powers of search, seizure and arrest. Responsibility to enforce controls on prohibited animal products at points of entry are given to HMRC by the **Products of Animal Origin (Third Country Imports) (England) Regulations 2006** and the **Control of Trade in Endangered Species (Designation of Ports of Entry) Regulations 1985** which implements CITES. These controls include checks on passengers' baggage, freight and post

from non-EU countries. Local Authorities are responsible for dealing with smuggled animal products when they are discovered inland at retail, catering, market stalls or other premises

### 4.3.2 Inspection & licensing

#### Abattoirs

The **Hazard Analysis and Critical Point (HACCP)** and the **Food Hygiene Regulations 2006** provide specific rules for food of animal origin and official controls on products of animal origin intended for human consumption which are enforced in abattoirs by the Meat Hygiene Service (MHS) as part of the Food Safety Agency. On-site handling of animal by-products (such as skins and hides) at abattoirs is also monitored by the MHS under the **Animal By-Products Regulations 2005**.

#### Farms

The **Animal Health Act 1981** gives powers of entry onto farms for vaccination, serology or slaughter. Its purpose is to control the spread of disease and eventually eradicate it by controlling movements and isolating areas where disease is confirmed. Under the Act Local authorities carry out routine monitoring of livestock on farms and check movement records, they also provide advice to animal keepers on:

- Farm livestock records
- Veterinary medicine records
- Animal movement licenses and passports
- Livestock identification
- Disposal of livestock carcasses
- Livestock vehicles – construction and cleanliness

Animal Health carry out spot checks and planned visits to farms, as well as following up complaints and reports of animal disease or poor welfare on specific farms. The Rural Payments Agency also visit farms for Single Payment inspections and may pick up animal health issues.

Other initiatives to prevent the spread of animal disease on farms are the **Biosecurity Guidance to Prevent the Spread of Animal Diseases** under the Animal Health Act 2002 and **Farm Health Planning**. The Biosecurity Guidance promotes good hygiene practices to keep new disease away from animals and to protect neighbouring farms and the countryside. Farm Health Planning is a partnership approach to disease prevention and control, encouraging animal keepers to work closely with their vets to set targets for animal health and welfare.

#### Laboratories

The principle consideration in respect of handling dangerous pathogens is containment to prevent exposure of laboratory workers and people and animals in the outside environment. The appropriate level of containment required will depend upon the hazard posed by the pathogens being handled at the laboratory. These are categorised in hazard groups 1 to 4. The **Specified Animal Pathogens Order (SAPO) 1998** prevents the release of dangerous animal pathogens into the environment and is made under the Animal Health Act 1981. Defra is responsible for licensing the possession of animal pathogens in England under SAPO, the inspection of licensed premises is carried out by the Health and Safety Executive (HSE).

#### Importing laboratory material

The **Importation of Animal Pathogens Order (IAPO) 1980** prohibits the importation of any animal pathogen or carrier into England from a 3<sup>rd</sup> country without a licence issued by Defra. Similar arrangements are in place in Scotland and Wales. IAPO also requires anyone in the possession of an animal pathogen or carrier which they suspect was imported without a licence to report the incident to a veterinary inspector. IAPO does not cover imports from Member States but anyone importing an animal pathogen or carrier must have a licence under SAPO for it to leave the border entry point.

### Livery establishments

Under the **Riding Establishments Acts 1964 and 1970** horse riding premises are inspected and licensed by Local Authorities on an annual basis. Here the focus Currently non-riding livery establishments are rarely visited by Local Authorities. However, it is proposed that under the **Animal Welfare Act 2006** Local Authorities should issue a licence of approval to livery establishments, which would require an inspection by the Local Authority with a veterinary surgeon before issue and relicensing every 18 months.

### Markets and shows

Animal Health are responsible for licensing any occasion at which animals are brought together for a breed inspection, onward consignment, a sale, exhibition or show. Under the **Animal Gatherings Order 2006** both Animal Health and Local Authorities ensure that adequate biosecurity measure are observed at these events.

### Pet shops

Local Authorities are responsible for licensing and inspecting pet shops under the **Pet Animals Act 1951**. The Act sets accommodation and other facility standards, requirements for registration, limits on stocking numbers, health standards, feed and transportation requirements. Proposals to update and amend requirements for pet shops are being considered under the Animal Health Act 2006.

### Vehicles transporting live animals

The **Transport of Animals (Cleansing & Disinfection) Order 2003** sets out requirements to improve standards of biosecurity on livestock vehicles to reduce the risk of spreading animal disease. Requirements include the cleansing and disinfection of the vehicle within 24 hours of being unloaded and before it is used again. Local Authorities are responsible for inspecting and enforcing the Order. Vehicle owners may be prosecuted if the rules are not followed. The Police assist Local Authorities with road blocks for inspections during an outbreak. The Order excludes vehicles used to transport horses. However, as with all vehicles that appear to be heavily soiled and may have been on a farming premises horse boxes may be stopped at a road block.

### Zoos

The **Zoo Licensing Act 1981** and the **Zoo Licensing Act (Amendment) Regulations 2002** require all zoos to be licensed by the Local Authority. Local Authorities are responsible for inspecting zoo premises before issuing a licence accompanied by a Defra approved inspector.

### Food retail outlets and food processing premises

Whilst these premises in themselves are not seen as presenting a high disease risk, the food waste from both retail outlets and food processors is seen as a potential risk if it contains animal by-products. Animals by-products are parts or products of animal origin not intended for human consumption. The **Animal By-Products Regulations 2005** provides controls for the collection, transport, storage, handling, processing and use or disposal of animal by-products. Similar Regulations are in place in Scotland and Wales.

Local Authorities are responsible for the enforcement of animal by-products legislation for food retail outlets and food processing premises in England, usually carried out by Trading Standards officers but sometimes Environmental Health Officers are given the role. There are provisions to allow some retail waste food to be fed to livestock, i.e. bread. In contrast all catering waste must not be fed to farmed animals.

#### 4.3.3 Movements & identification

The **Animal Gatherings Order 2006**, the **Movement of Animals (Restrictions) (England) Order 2002** and the Standing Movements Arrangements (SMA) under the **Disease Control**

**(England) Order 2003** and **Disease Control (England) (Amendment) Order 2008** provide generic animal movement legislation.

There are a number of prohibited movements for all species (except deer). These are movements from:

- Market of any description to another market of any description
- Market of any description to a collecting centre
- Market to AI
- Collecting centre to a market of any description
- Collecting centre to collecting centre
- Slaughterhouse to any other place
- Dedicated slaughter market to any premises other than a slaughterhouse
- Dedicated slaughter market to any premises other than a slaughterhouse

For other movements of cattle, sheep and goats under the Disease Control (England) Order 2003 and Amendment Order 2008 a 6 day Standstill applies, this is increased to 20 days for pigs. This means that movements must not take place from any premises where one, or more animals have been moved onto the premises in the last 6 days. Pigs trigger a 20 day standstill on other pigs when they move onto a premises but only a 6 days standstill on cattle, sheep and goats on the premises. There are a number of exemptions to the Standstill rules – see section 4.3.4.

Animal specific requirements also exist for identification and tracing and specific diseases. The primary regulations for these are:

### **Cattle**

Regulation (EC) No 1760/00 establishes a system for the identification and registration of bovine animals and sets out the requirements regarding the labelling of beef and beef products. This details requirements for eartags, cattle passports, a computerised database and up-to-date on-farm registers. These EC requirements are enforced in England through the **Cattle Identification Regulations 2007** and the **Cattle Identification (Amendment) Regulations 2007**. The 6 Day Standstill applies to cattle and all movements must be reported to the British Cattle Movements Service (BCMS), within 3 days of the movement occurring, for entry onto the Cattle Tracing System (CTS).

### **Sheep & goats**

The **Sheep and Goats (Records, Identification and Movement) (England) Order 2007** provide requirements for ear tags, flock and herd registers, movement documentation and reporting. A number of movements are prohibited, these are:

- Assembly centre to any other place other than to:
  - A port or airport
  - The premises from which the pigs were originally consigned to the assembly centre
  - A slaughterhouse within GB
  - A dedicated slaughter market

The 6 Day Standstill applies to sheep and goats, and all movements must be reported to the Local Authority (within 3 days) for input onto the Animal Movements Licensing System (AMLS).

### **Deer**

The movements of deer are no longer subject to standstill restrictions, nor are they subject to rules on multiple pick-ups and drop-offs. Movements still must be reported within 3 days to Local Authorities for entry on AMLS and deer still need to move under a General Licence. Farmed deer, however, need to be uniquely identified and TB tests are required for imported deer, the removal of restrictions, diagnostic purposes and the Deer Health Scheme. Under the

**Tuberculosis (Deer) Order 1989** and the **Tuberculosis (Deer) (Amendment) Order 1993** suspicion of TB in any deer, whether farmed, park or wild, must be notified to AH.

## **Pigs**

The **Pigs (Records, Identification and Movement) Order 2007** sets out the requirements for ear tags, record keeping, movements and walking licenses for pet pigs. Pig movements are subject to a 20 Day Standstill under the Disease Control (England) Order 2003 and the Disease Control (England) (Amendment) Order 2008. All pig movements must be reported to the Local Authority, within 3 days, for entry on to AMLS.

## **Horses**

The **Horse Passport Regulations 2004** requires all owners to obtain a passport for each horse that they own. Owners cannot sell, export, slaughter for human consumption, use for the purposes of competition or breeding a horse which does not have a passport. In addition Government is working with the British Equestrian Federation to develop a National Equine Database. The core system is already in operation and contains horse identification details from passports issued. It is hoped that the database will provide accurate information on the size of the UK horse population and its geographic distribution so enable the monitoring of equine diseases, and the development of effective control strategies to mitigate the risk of an outbreak of exotic disease in horses. However, the database does not contain details of horse location but instead contains owner information. In addition, many horses are not removed from the database when they die resulting in inaccuracies in the size of the equine population as reported by the database.

### **4.3.4 Derogations and exemptions**

There are a number of exemptions to the standstill regime which have been put in place since 2002, following discussions with stakeholders and a veterinary risk-assessment of lifting the restriction on movements for particular purposes .

- **Linked Holdings** – County Parish Holding (CPH) numbers linked on the Cattle Tracing System (CTS) by British Cattle Movements Service (BCMS) to mitigate the reporting burden on keepers for daily movements i.e. for grazing, milking etc. Movements within the link do not need to be reported. There is no distance limit between holdings.
- **Sole Occupancy Authorities (SOA)** – a group of premises within the same management and control. Animals can move between premises in the SOA without observing standstill. However, cattle movements should still be reported to BCMS unless there is also a CTS link. SOAs are issued by DVMs (AH).
- **Breeding rams and bulls** – 1 Aug – 30 Nov every year breeding rams and bulls can leave a premises and do not trigger standstill if isolated for 6 days.
- **Animal Gatherings Order 2006** – allows movements to premises licensed under the Order for onward movement without triggering standstill, i.e. to markets, collecting centres, shows etc.
- **Imported animals and animals destined for export** – do not trigger standstill at the first premises where they are kept after port of entry itself. Doesn't apply to ports and airports.
- **Movements to slaughter** – can leave premises for abattoir, slaughter collecting centre, slaughter collection or slaughter market irrespective of when it entered the premises.
- **Movements for veterinary treatment** – may move irrespective of when moved onto the premises but must be isolated at veterinary treatment centre. Treatment centre is not subject to standstill requirements and standstill is not triggered when they return to premises.



- **Movements to and from artificial insemination centre** – provided they have been isolated 6 days prior to departure. AI centre not subject to standstill.
- **Movements to laboratory diagnostic tests** – do not need to respect standstill requirements and will not trigger standstill at laboratory but must be held in isolation.
- **Performing animals** – permits issued by Animal Health to dis-apply standstill.
- **Pig pyramids** – pigs intended for breeding or growing from a Defra approved source and authorised by a veterinary inspector standstill does not apply before departure, on arrival or return.
- **Breeding pigs** – 20 days isolation prior to departure or upon arrival it will not trigger standstill. And will not trigger standstill on return if isolated for 20 days after its return.
- **Breeding goats** - 6 days isolation before they leave premises of origin will not trigger standstill.

#### 4.3.5 *Disease specific legislation*

There are also a number of disease specific controls, details of which can be found at Annex 6.

### 4.4 Levels of enforcement and compliance

Defra's delivery partners are responsible for enforcing and ensuring compliance with the various controls in place to control and mitigate the likelihood of an exotic disease incursion. Data on the enforcement of these controls varies and central records only provide part of the real picture. However, despite being incomplete the information gathered and stored on systems such as the Import Risk Management System (IRMS), TRACES etc does provide some useful intelligence on current levels of enforcement and compliance.

#### 4.4.1 *Import controls*

Of the live animal imports which occur, a certain percentage (set by EU legislation) are checked by Animal Health (AH) officers at Border Inspection Posts, including documentary checks, identity checks and physical checks of the animals, which may include laboratory tests for certain identified diseases. Similar checks are carried out on animal product imports by Port Health Authorities / Local Authorities, again a certain percentage of imports will be checked based on type of product. An import risk management system (IRMS) has been established between Defra and AH, which contains details of all inter-community trade consignments entering GB and sets the level of checks which are required according to an importer's history of non-compliance. It is not permissible to target inspections based on an individual member states opinion of the disease status of the country of origin, as disease risks are calculated by the EU and the level of checks on third country imports are set in legislation. The inspections which have been carried out and the results of those inspections are reported to AH Chelmsford and Defra via IRMS.

A certain proportion of the checks fail, for a variety of reasons, incorrect certification, clinical signs in the animal being imported, illegal goods being imported (see figure 20). Imports which fail these checks are either returned to country of origin or are disposed / destroyed, depending on the type of consignment and the risk posed. For intra-community trade, IRMS allows Defra and AH to determine where the majority of problems lie in the import of animals and products of animal origin and therefore where to target checks in the future.

As for live animals, all products of animal origin imported into GB from countries outside the EU must be checked at an approved Border Inspection Post (BIP) to ensure they meet animal and public health import conditions. These include a check on documentation, an identity check and a physical check on the product, which may include laboratory analysis. All consignments undergo a documentary check and identity check. A percentage of products have a physical check (between 1% and 50% depending on the animal and public health risks associated with

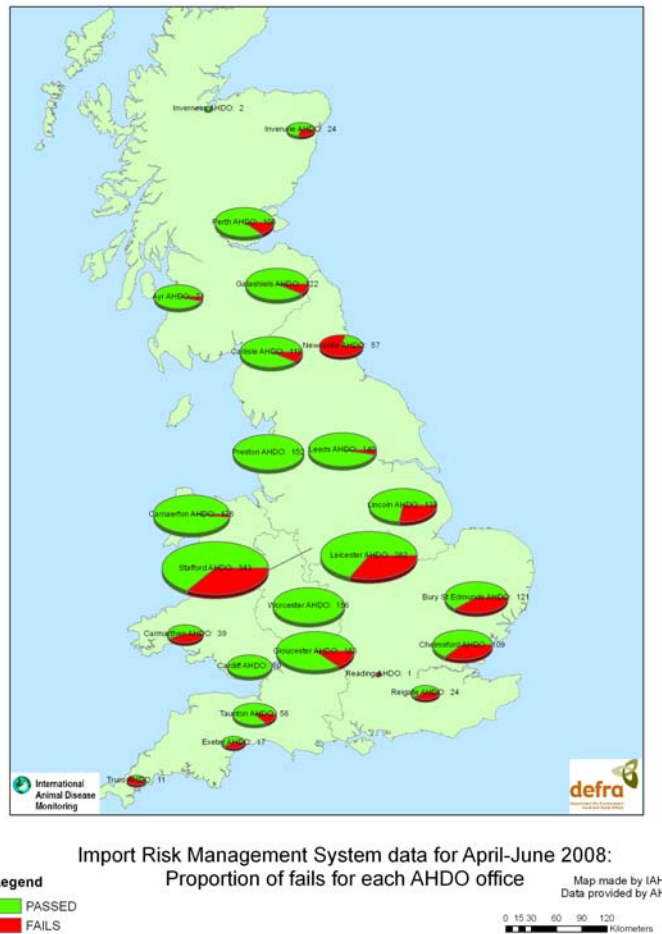


the product). Animal Health and Local Authorities carry out the veterinary inspections at BIPs, HM Revenue and Customs (HMRC) conduct searches for illegal imports.

Working closely with HMRC and the UK Border Agency (UKBA) is vital in preventing the import of illegal products and livestock into GB. UKBA undertake risk based and intelligence led enforcement measures to prevent illegal imports. Resources are targeted on those entry routes that pose the greatest threat of introducing animal disease. A range of risk indicators are used to target illegal imports, including:

- Latest animal disease risk assessments put together by veterinary experts from Defra on the current global and regional outbreak situation. Defra provide HMRC and UKBA with a global risk map produced from OIE information which categorises countries into RED, AMBER and GREEN risks according to the prevalence of animal diseases, which assists UKBA in targeting traffic from high risk countries and high risk products;
- Historical data on the types of animal products seized, high risk routes, typical methods of concealment and any other risk trends;
- Any other relevant risk information from other national, EU and non-EU country enforcement agencies;
- Specific intelligence on suspect importers and/or consignments;
- Results from Detector Dog checks on passenger baggage.

**Figure 20:** Animal Health offices in GB and proportion of inspections carried out on imports that result in failure



UKBA do make seizures in freight and are working with Defra on a project to refine risk.

### Imported animals

In addition to IRMS, which focuses on the movement of imports once in GB, the Trade Control and Expert System (TRACES) enables Member States to track the movements of live animals, some animal products and germplasm into or through their territories.

In 2007 the number of imported animals and birds landed in GB and found to be affected by a notifiable disease was 21 cattle from Germany infected with Bluetongue. The cattle were inspected under The Animal and Animal Products (Import and Export) (England) Regulations 2006. Under the legislation live animal imports from other EU Member States are not tested for disease at the border with post import checks instead taking place at the intended destination.

### Postal imports

HMRC are responsible for the seizure of live animals or animal products under CITES which have been illegally imported into GB by post. The Royal Mail scan all post entering GB from another country at the postal customs depot in Coventry. Royal Mail inform HMRC if action needs to be taken. HMRC also carry out selective examinations to ensure that no prohibited or

restricted goods are being improperly sent. However, post cannot be opened without a member of the Royal Mail present.

#### 4.4.2 Inspection and licensing controls

##### 4.4.2.1 Abattoirs

The Meat Hygiene Service is responsible for the protection of public health and animal health and welfare in Great Britain, through proportionate enforcement of legislation in approved fresh meat premises – such as slaughterhouses and cutting plants. This involves specific inspections of all animals, carcasses and offal.

##### 4.4.2.2 Farms

Local Authorities target farm visits and inspections other livestock holdings based on their assessment of risk. There are 118,735 registered livestock holdings in England (2006 Agricultural Survey data) and approximately 21,700 holdings with livestock in Wales (2007 WAG). Local Authorities target their resource towards premises most likely to be non-compliant with the requirements of the Animal Health Act 1981 and its associated orders.

Defra has a duty under the Animal Health Act 1981 to make an annual return to Parliament on the expenditure and prosecutions taken under the Act and the incidences of disease in imported animal for the year. The majority of this information is taken from the Animal Health and Welfare Management and Enforcement System (AMES) into which Local Authorities input data. This data is incomplete, 136 Local Authorities in England and Wales out of a total of 170 used AMES in 2007. However, this is the only central record of enforcement action taken under animal health and welfare legislation, and it is believed that the Local Authorities with a significant number of livestock premises do use the system. To supplement the data Defra write out annually to all Local Authorities requesting enforcement information.

#### Formal action

The information is split into formal enforcement actions and other actions, such as advice and warnings. The table below shows the number of formal enforcement actions taken in 2007, the prosecutions initiated and what percentage of these resulted in a conviction. A Home Office caution is an alternative to prosecution if it is considered that it is not in the public interest to enforce criminal proceedings. The offended must admit guilt before this type of caution can be administered.

**Table 16:** Formal enforcement actions under the Animal Health Act 1981 and other animal health & welfare legislation by Local Authorities in 2007

Policy area	Home Office cautions issued	Prosecutions initiated	Convictions achieved
Animal by-products	43	99	67 (68%)
Biosecurity (including animal gatherings)	2	15	4 (27%)
Cattle identification, movement and records	36	108	50 (46%)
Sheep and Goat identification, movement and records	5	36	18 (50%)
Pig identification, movement and records	2	9	4 (44%)
Disease control and standing regime controls	138	54	30 (56%)
Welfare on farm (including medicine records)	19	128	92 (72%)
Welfare during transport	18	67	41 (61%)
Welfare at markets and other places of sale	13	20	3 (15%)
<b>Total</b>	<b>276</b>	<b>536</b>	<b>309 (58%)</b>

### Informal action

Informal action is also taken by Local Authorities and recorded on AMES. The table below shows the other enforcement actions reported to Defra using AMES during 2007. The various options available to Local Authorities are:

- Oral advice – simply informing the regulate person what needs to be done or changed
- Written advice – similar to above but more formal in writing
- Oral warning – informing the regulated person that future repetition of non-compliance may result in more stringent enforcement action being taken
- Written warning – where it is considered it can be proved the law has been broken a written warning will state this and may be taken into account should the person re-offend
- Referral to Animal Health for licence conditions – this may include a temporary revocation or restriction of licence or permit

It is important to note that Local Authorities target their resources at the premises that are most likely to be non-compliant, therefore, a greater proportion of non-compliance can be expected than if inspections were on a purely random basis. Thus this data cannot be used a definitive indication of compliance across the animal keeping sector.

**Table 17:** Total number of other enforcement actions undertaken as recorded on AMES by Local Authorities during 2007

Policy Area	Enforcement Actions				
	Oral advice given	Written advice issued	Oral warning given	LA written warning	Referred to AH for licence conditions
Animal by-products	904	432	171	169	0
Biosecurity (including animal gatherings)	902	230	394	98	2
Cattle identification, movement and records	2362	1856	511	794	1
Sheep and goat identification, movement and records	6261	5928	984	834	1
Pig identification, movement and records	986	606	81	90	3
Disease control & standing regime controls	1658	1131	460	923	0
Welfare on farm	1671	838	260	516	1
Welfare during transport	799	198	450	381	0
Welfare at market (and other places of sale)	508	137	175	136	1
<b>Totals</b>	<b>16051</b>	<b>11356</b>	<b>3486</b>	<b>3941</b>	<b>9</b>

#### 4.4.2.3 Laboratories

There are 51 Specified Approved Pathogens Order (SAPO) approved facilities in England: 9 Category 4 facilities; 16 Category 3 facilities; and 26 Category 2 facilities. Defra is responsible for licensing all facilities under SAPO in England and HSE carry out all inspections to ensure that the facilities are meeting the requirements of the licence. In the past year of inspections no

facility has had its licence suspended as a result of compliance failure and in June 2009 there were no improvement/prohibition notices under SAPO.

#### **4.4.3 Movements and identification controls**

Livestock movements under General Licence are enforced by Local Authorities. Animal owners wanting to move livestock must apply for a licence from their Local Authority.

### **4.5 Controlling the pathways of highest risk**

As illustrated there are various exotic disease controls in place. Table 18 below maps these controls against the pathways representing the highest risk to highlight our confidence in enforcement and our feeling for the level of compliance. This is based on the information gathered in interviews with experts and at the delivery partners workshop. Whilst this initial assessment is based on a number of assumptions and anecdotal evidence it has been discussed and validated with the appropriate policy leads.

Table 18 rates our confidence for each risk pathway against eight different control measures. Not all will be relevant for each pathway but the table gives an indication of current management tools and the level of intervention to reduce the risk represented by the pathway. It also highlights our confidence in the amount of feedback we receive from delivery partners and stakeholders which helps to provide us with an evidence base for policy making. The last two columns represent other factors which may influence the effectiveness of controls and their enforcement.

Definitions for the different column headings are:

**Legislation** – regulations in force to control and manage the pathway

**Level of enforcement** – how much activity is put into making certain that the legislation is obeyed

**Guidance** – formal help and advice about how to reduce the risk of an exotic disease incursion exploiting the pathways, may set out the requirements of the legislation in a more user-friendly format

**Checks / inspection** – documentary, identity and physical checks of animals and/or products; or inspections of premises

**Monitoring / surveillance** – formal monitoring of volumes and/or movements and information collecting and collating

**Record keeping requirement** – formal requirement to record an activity which is officially checked by enforcement officers

**Notification requirement** – formal requirement to notify the appropriate body of an activity associated with the pathway

**Penalty / seizure** – formal disadvantage in place to deter non-compliance, which can include financial fines, criminal sentences, revocation of licences, seizure of animal or product

**Level of feedback** – how much information received from delivery partners on the management of the pathway

**Level of compliance** – rough view of the number of activities complying with the legislation or guidance and the proportion of incidents which are non-compliant

**Non-compliance incentive** – drivers encouraging non-compliance with legislation or guidance, which can be economic or behavioural

**Complexity of delivery arrangements** – the number of delivery partners / processes involved which may impact on compliance and enforcement activities

### **Confidence descriptions for controls**

Measuring confidence is a qualitative assessment and has been used here to describe how we think the pathways are currently being managed. Distinguishing confidence levels allows some degree of comparison to be made between the way the different pathways are being managed. The following descriptions were used to help differentiate the confidence categories for the controls.

<b>High</b>	<ul style="list-style-type: none"> <li>• Fit for purpose legislation</li> <li>• Level of enforcement is proportionate to the risk</li> <li>• Comprehensive and clear guidance available</li> <li>• Checks and inspections being carried out are proportionate to the risk</li> <li>• Appropriate amount of information is being collected to monitor and survey the risk</li> <li>• Up-to-date records are kept and checked appropriately</li> <li>• Activities are correctly notified to the appropriate regulator(s)</li> <li>• Penalties are an effective deterrent to non-compliance</li> <li>• Up-to-date, regular feedback received on the management of the pathway and the current risk</li> <li>• Anecdotal evidence and formal feedback shows that generally controls are complied with</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>• Legislation is workable but could be further strengthened</li> <li>• Some pressure to increase the level of enforcement to better manage the risk</li> <li>• Guidance is available but complexity of requirements limit its influence</li> <li>• Checks and inspections could be increased / more thorough to manage the risk</li> <li>• More information could be collected to improve our understanding of the risk and to enable us to monitor how it may be changing</li> <li>• Records are kept but level of completeness varies and they are not always fully checked</li> <li>• Some activities are notified or not all appropriate delivery partners are informed</li> <li>• Penalties act as a deterrent but are time consuming to enforce and therefore not always used when appropriate</li> <li>• Incomplete feedback received on the management of the pathway and the current risk</li> <li>• Anecdotal evidence and/or formal feedback shows that compliance varies significantly</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>• Legislation is complicated and there may be perceived loopholes</li> <li>• Level of enforcement is below what is needed to manage the risk</li> <li>• Guidance is out of date or poor</li> <li>• Checks and inspections are not being carried out frequently enough, or effectively as necessitated by the risk</li> <li>• Little information is being collected and we are unable to effectively monitor the risk</li> <li>• Requirement to keep records is not met and appropriate checks are not carried out consistently</li> <li>• No formal notification is made despite being a requirement</li> <li>• Penalties are not proportionate to the activity and/or the work involved in taking forward the prosecution</li> <li>• Little or no feedback received on the management of the pathway and the current risk</li> <li>• Anecdotal evidence and/or formal feedback shows that controls are generally not complied with during peacetime</li> </ul>
<b>Unknown</b>	<ul style="list-style-type: none"> <li>• Level of enforcement is unknown as there is little feedback from delivery partners / enforcement officers</li> <li>• Compliance is not measured and / or not reported</li> </ul>

**Confidence descriptions for other factors of influence**

The last two columns have been used to assess the influence of other factors on compliance and enforcement. Again the evidence is generally qualitative and based on the outputs from meetings with experts and the delivery partners workshop. The following descriptions were used to differentiate the influence of the other factors on the pathways. In this instance high is negative, i.e. we are highly confident that there is a economic incentive to not comply.

<b>High</b>	<ul style="list-style-type: none"> <li>• Strong economic incentive to not comply with controls</li> <li>• Complying with controls clashes with a well established behavioural culture</li> <li>• Delivery arrangements are complex with delivery partners and/or stakeholders unclear about roles and responsibilities</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>• Some economic incentive to not comply with controls but benefits are marginal currently</li> <li>• Compliance requires some behavioural change but we think progress is being made and good practice is becoming increasingly normalised</li> <li>• There are more than one delivery partner responsible for enforcement and control but generally these relationships work, although there is some need for further strengthening / consistency</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>• There is no or little economic incentive not to comply</li> <li>• Generally compliance has been adopted as the behavioural norm</li> <li>• Delivery arrangements are clear and everyone understands their roles and responsibilities and the roles and responsibilities of others</li> </ul>
<b>Unknown</b>	<ul style="list-style-type: none"> <li>• The economic incentive is unknown, or it is unknown how it may change in the current economic climate</li> <li>• Little is known about behaviours or there are a number of different groups involved so it is not possible to specify</li> </ul>



**Table 18:** What level of confidence do we have in existing measures to manage and mitigate the high risk pathways and how influential are other factors in controlling and enforcing these measures

Risk Pathways	Control Measures and other Factors											
	Legislation	Level of enforcement	Guidance	Checks / inspection	Monitoring/ surveillance	Record keeping requirement	Notification requirement	Penalty / seizure	Level of feedback	Level of compliance	Non-compliance incentive	Complexity of delivery arrangements
Imports of Livestock (EU)	●●●	●●○	●●●	●●○		●●○	●●○	●●○	●●○	●●○	○○○	○○○
Imports of Livestock (3 <sup>rd</sup> country)	●●●	●●○	●●●	●●○		●●○	●●○	●●○	●●●	●●○	○○○	○○○
Imports of Pets (excludes horses)	●●●	●●○	●●●	●●●		●●○	●●○	●●○	●●○	●●○	○○○	○○○
Imports of Meat (EU)	●●●	●●○	●●●	●●○				●●○	●●○	●●○	○○○	○○○
Imports of Meat (3 <sup>rd</sup> country)	●●●	●●●	●●●	●●○		●●○	●●○	●●○	●●●	●●○	○○○	○○○
Imports of Germplasm	●●●	●●○	●●●	●●○		●●○	●●○	●●○	●●○	●●○	○○○	○○○
Imports of lab material	●●●	●○○	●●○	●●○		●○○	●○○	●●○	●○○	●●○	○○○	○○○
Livestock transport vehicles from abroad	●●○	●○○	●●○	●○○				●●○	●○○	●○○	○○○	○○○
Importation & Movement of Horses	●●●	●●○	●●○	●○○		●●○	○○○	○○○	●○○	●●○	○○○	○○○
Waste from Retail / Food Processing	●●●	●●○	●●○	●●○		●○○		●○○	●●○	●●○	○○○	○○○
Migration of Wild Birds					●●○				●●○			
Movement of Livestock around GB (farms)	●●○	●●○	●●○	●●○		●●○	●○○	●●○	●●○	●●○	○○○	○○○
Movement of Livestock around GB (gatherings)	●●○	●○○	●●○	●●○		●●○	○○○	●○○	●●○	●○○	○○○	○○○
Contact between livestock & wildlife			●●○						●○○	○○○	○○○	○○○
Contact between livestock & competent insect vectors			●●○						○○○	○○○	○○○	○○○

●●● High; ●●○ Medium; ●○○ Low; ○○○ Unknown; blank - no measures in place / not relevant to this pathway

#### 4.5.1 Assessing controls and other influences

This high level assessment uses information from a number of sources. Feedback from the workshop with delivery partners and the various interviews with experts gave a flavour of the level of enforcement, compliance and the complexity of delivery arrangements. Desk-based research of the legislation, guidance and requirements complimented the anecdotal evidence, as did the findings of a number of reviews that have been carried out for the department in the past 5 years, such as Madders and the Eves review.

In bringing together anecdotal evidence, research and reviews by others a number of assumptions had to be made about how the pathways are being managed and the other factors that may influence the behaviours of both the enforcers and those being regulated. The assumptions and the reasoning behind the confidence ranking in the table above is explained below by pathway. All pathway assessments at this stage have been checked with the relevant policy lead in Defra.

##### Imports of Livestock (EU)

Legislation was seen as fit for purpose and appropriately enforced. However, enforcement officers are reliant on information from the exporting Member States. The Trade Control and Expert System (TRACES) enables Member States to track the movements of live animals into and through their territories. Delivery partners have expressed concern that the correct destination address is not always given, making it impossible to carry out the appropriate post import checks. Livestock keepers must make a record of imported stock but Local Authorities were not always notified

##### Imports of Livestock (3<sup>rd</sup> country)

Only a small number of livestock enter GB directly from a 3<sup>rd</sup> country. Delivery partners highlighted that imports from 3<sup>rd</sup> countries via another Member State would be treated as EU imports and again GB would be reliant on the competency of other Member States. Checks and inspections for 3<sup>rd</sup> country imports are carried out at the border rather than destination. The level of feedback was thought to be comprehensive for 3<sup>rd</sup> country imports as tighter checks and records systems are in place.

##### Imports of pets (excludes horses)

Similar confidence in legislation, enforcement and guidance as with other imports. The checks and inspection regime is strong, with the UK reinforcing EU rabies and pet movement controls.

However, compared to other animal imports there is a strong economic incentive to not comply with the legislation. The pet trade market is large and lucrative. Small animals in particular can be imported from Europe without going through the necessary checks and quarantine. The availability of some of these animals for sale online is evidence of illegal activity. Delivery partners voiced concerns that the level of inspection and follow up enforcement once an illegal pet import was inland was low.

##### Imports of Meat (EU)

As with other EU imports the onus is on the exporting Member State to ensure that all the requirements are met. As with live animals TRACES is used to track the movements of some animal products into or through GB, it does not cover inter-community trade in meat.

##### Imports of Meat (3<sup>rd</sup> country)

Products of animal origin from outside the EU are subjected to more stringent checks. Personal imports from passenger aircraft are targeted based on risk. The recording of information and the data fed back to the centre on 3<sup>rd</sup> country imports is also more comprehensive. Given the stricter restrictions there is a greater incentive not to comply by illegally importing speciality animal products.

### Imports of Germplasm

Management and control of this risk pathway is the same as for imports of meat. As with meat imports different controls and checks are in place depending if the import is from within the EU or from a 3<sup>rd</sup> country. Movements of germplasm can also be tracked using TRACES.

### Imports of Laboratory Material

Whilst legislation is in place to control the importation of laboratory material the level of enforcement is low. Regulation and inspection of high containment licensed laboratories under SAPO is generally seen as good and most are well controlled. However, there are numerous research institutions, universities and museums which regularly import material and operate relatively unchecked. Whilst institutions are required to notify Defra when a SAPO regulated animal pathogen is imported into GB it is not known whether the smaller less regulated bodies comply. Indeed there is a large amount of anecdotal evidence that the level of compliance by these research bodies is low. The level and quality of checks on materials entering the country for animal products or pathogens are unknown.

### Livestock Transport from Abroad

One of the conclusions at the workshop with delivery partners was that the cleansing and disinfection of livestock vehicles only happened effectively during an outbreak. In peacetime enforcement levels and compliance are low. With keepers and vehicle drivers reluctant to queue to carry out the necessary cleaning before moving on to the next destination. The 24hour window to carry out the cleansing and disinfection was also seen as a loophole. Delivery partners and other experts have indicated that this is not only an issue for vehicles returning to the UK from abroad but for vehicles involved in internal movements. It is recommended that when assessing our resilience that this pathway be expanded to all livestock vehicles.

### Importation & Movement of Horses

The main concern expressed is linked to the apparent lack of information on the equine population and its movements. Under the current horse passport system there are a number of different passport issuing bodies. The general feeling is that the level of control is low and anecdotal evidence suggests that formal checks on passports are not always thorough. For example, at the workshop with delivery partners failure to ensure pre-movement healthchecks had been carried out prior to EU movements was seen as an issue.

### Waste Food from Retail and Food Processing

Following the lessons learned from FMD 2001 this pathway is seen as being stringently controlled. Whilst there were some concerns around the enforceability of animal feed controls, this pathway is considered well regulated and managed. Confusion over responsibilities reflects the complexity of enforcement arrangements, with different delivery partners taking the lead for inspecting different waste streams. Generally though there is a lot of guidance and information on how waste food can and can't be disposed, and in particular what can be fed to farmed animals.

### Migration of Wild Birds

This is a pathway that we are unable to have much influence or control over the risk on a day-to-day basis. Advice is given on the keeping of birds, and biosecurity guidance and information on wild bird migration patterns are available. The pathway is monitored as part of Defra Surveillance Strategy.

### Movement of Livestock around GB (farms)

Management and control of the risks associated with this pathway are perhaps the most complex. There are a number of general requirements on animal movements as well as species specific rules. Alongside this there are a number of derogations and exemptions which add to the complexity. A range of delivery partners are involved in the licensing, monitoring, inspecting and enforcement of these requirements. Whilst there is data on movement reporting and enforcement action taken this information is not complete. However, it does provide an indication of behaviours.

#### Movement of Livestock around GB (animal gatherings)

As well as movement controls biosecurity and cleansing and disinfection (C&D) requirements apply to this pathway. Anecdotally enforcement of these rules is seen as low – as with the C&D of vehicles.

#### Contact between Livestock & Wildlife

There are no formal controls in place to manage this pathway. Biosecurity guidance is applicable but has no legal base for enforcement. The general view is that on-farm biosecurity measures are not checked or reported on. The level of compliance therefore is unknown. However, anecdotal evidence suggests that it is low. As with C&D measures, biosecurity becomes more of a priority during an outbreak.

#### Contact between Livestock & Competent Insect Vectors

As with the migration of wild birds this is a pathway which we are unable to have much influence or control. Specific guidance is available but the benefits of the suggested measures are not scientifically proven and we have no inform

# 5 Review of our Resilience in Controlling and Mitigating Exotic Diseases

## 5.1 What is working?

Delivery partners identified a number of strengths in the existing disease control framework. In particular quarantine and laboratories were seen as well controlled, well managed and properly maintained. Controls at animal gatherings and livestock markets were seen as effective and well enforced, although subsequently Defra policy leads have expressed concern that we have no formal information. The personal imports campaign and HMRC's liaison work with target third countries were seen as successes to be built upon further along, with the good controls at border inspection posts (BIPs).

The positives were not limited to the effectiveness of measures. The strengths also highlighted the attitudes, behaviours and commitment of delivery partners in managing the risk of exotic disease incursion and spread. In particular the motivation, skills, knowledge and expertise of frontline staff, which were recognised by their effectiveness during recent outbreaks. There was also a strong commitment shared by all to improve services provided and work more effectively together. There were many examples of good practice which were discussed and should be shared.

## 5.2 Our resilience

Our resilience is our ability to reduce and manage the risk of an exotic disease outbreak. It is our enforcement and delivery of exotic disease prevention controls, and surveillance of animal disease both within GB and internationally.

The delivery partners workshop on 26 November, identified four interrelated high level areas essential to the effective enforcement of exotic disease management and mitigation measures:

- Legislation
- Resources
- Communication
- Attitudes & behaviour

Figure 21: “Word cloud” from the Strengths, Weaknesses, Opportunities & Threats (SWOT) Analysis carried out at the Workshop with Delivery Partners on 26 November 2008. The cloud gives greater prominence to words that appear more frequently in the source text.



The following sections look at the four main themes and highlights the areas and issues that need to be taken into consideration when we are assessing our resilience to an exotic disease outbreak. Again this is based on the discussions at the delivery partners workshop and the experiences of those involved in the event.

### 5.2.1 Legislation

Having a solid legislative framework was seen as fundamental to the successful delivery and enforcement of exotic disease controls. The legislative framework needs to provide a strong base for the effective use of resources, good communications and appropriate attitudes and behaviour.

#### **Enforceable legislation that is clear and widely understood**

A brief review of the relevant legislation shows that the exotic disease control and mitigation framework is relatively complex. (For relevant legislation see section 4.3 and Annex 6) There are a number of reasons for this. The transposition of EU legislation can overlap with existing controls and legislation is frequently updated. Legislation is often made during an outbreak, specific to the disease at the centre of the emergency and may be less relevant to other diseases. Measures during an emergency can differ from the controls put in place during peacetime, and where one begins and the other ends may cause confusion.

Getting the balance between mitigating the risk of disease spread and facilitating the necessary economic activities of the livestock industry is difficult. To reduce the impact of the standstill rule on the industry a number of derogations have been introduced to allow animal movements for specific purposes, or in specific circumstances. (see section 4.3.4 for an overview of the derogations in place) These exemptions to the standstill rule are an additional layer for officers to licence and enforce, and for animal keepers to comply with.



In assessing our resilience to a disease outbreak we will want to consider the complexity of the legislation both already in force and its compatibility with any additional measures put in place during the event. Legislation and controls must be understood by those responsible for enforcement and compliance, as well as those we regulate. A misunderstanding of the different requirements could lead to an inconsistency in observance of the rules and their implementation.

### **Operating in an EU context**

As a member of the EU the UK applies intra-community trade rules to all imports from other Member States. The effectiveness of EU import controls relies on the level of implementation by other Member States and the onus is on the exporting country to implement disease control measures. The system requires accurate data and documentation. For example, there is a reliance on the exporting country to provide accurate destination addresses to enable post-import testing to be carried out.

Being part of the EU also means that preventive measures are based on an EU risk assessment which the UK and other Member States feed into. For example, a derogation from EU law allows the UK to apply different rabies (and other pet movement) controls from other Member States. When this derogation ends, and subject to discussions in the EU, the UK will potentially need to ensure resilience to rabies based on harmonised controls.

### **5.2.2 Resources**

As with all areas of public funding delivery partners have to prioritise their efforts and resource based on risk and impact. Given that resources are not infinite, for this process to be effective investment must be targeted to deliver value for money against priorities.

### **Funding and resources**

Funding and resource ceilings mean that inevitably we have to live with a level of risk. Even with unlimited funds exotic disease control and mitigation measures would never be able to remove all risk. Trade flows, for example, mean that it is impossible for all imports to be physically checked.

Joined-up working enables limited resources to go further. The ability of delivery partners to work together during an outbreak is a clear demonstration of the benefits of joined-up working. We can strengthen our resilience further by learning from these experiences by continuing the relationships and common purpose to drive day-to-day enforcement and control. A co-ordinated approach to priorities also offers better value for money.

### **A comprehensive and collective evidence base**

Frontline officers hold valuable local knowledge and intelligence, which delivery partners rely on for enforcing controls and Defra uses to make informed policy decisions. Information on behaviours provides a level of realism to our understanding and assessment of our resilience to an exotic disease outbreak.

It is important therefore, that delivery partners have the means to record and share data. Various monitoring and record keeping requirements are in place but our level of resilience also depends upon the quality of this intelligence and how it can be used. IT systems need to support and encourage the sharing of information, and should remove the necessity to duplicate data by recording it in more than one place.

In testing our resilience gaps in data need to be identified and addressed. Further strengthening of available information on sheep and horses, for example, is needed if we are to have a clear picture of their distribution and movements.



As well as local information we rely on information from other countries to assess risk and identify threats. The quality of that information and our relationship with other Member States and third countries will influence our confidence in our evidence base and our assessment of our resilience.

### **5.2.3 Communication**

Delivery partners have a key role in communicating with stakeholders, feeding back intelligence to Defra and sharing information with other enforcement bodies.

#### **Clear roles, responsibilities and a single message**

If enforcement officers are to work together they need to have a clear understanding of the roles and responsibilities of the numerous delivery partners involved in the control and mitigation of exotic animal disease. It is important that our customers know who to contact and when. To the public all delivery partners are seen as the 'Government', so a single message is essential to avoid confusion and contradictory advice.

### **5.2.4 Attitudes and Behaviour**

Perhaps the biggest challenge to assessing our degree of resilience is understanding the behaviour of animal keepers and the general public (the latter with regard to personal imports).

#### **Non-compliance, both intentional and due to ignorance**

The difference between intentional and accidental non-compliance is not clear cut. Deliberate non-compliance threatens our resilience to an exotic disease incursion by making our control measures ineffective. Despite feeling some sympathy for those who contravened the controls due to a misunderstanding of the legislation, enforcement officers at the workshop saw both as creating a risk. Clear legislation and consistency in advice and messages can help reduce unintentional compliance and misunderstanding. A good example of this is the cross-media campaign to raise travellers' awareness of the rules on personal imports. Intentional non-compliance was seen as more of an issue and often driven by economic factors. If left un-tackled certain behaviours in sectors could develop into an embedded cultural norm, with a critical impact on our resilience to preventing an outbreak.

#### **Tackling illegal imports**

Non-compliance with import controls and smuggling can threaten our resilience to an exotic disease incursion. The UK Border Agency operate a dedicated animal products team and risk / intelligence based checks are carried out at other points of entry. As highlighted in the section on funding it is impossible to check all consignments and all people entering the UK for illegal imports. Our ports of entry however, present an obvious risk and we need to be confident that we understand how they are being managed and that we are comfortable with the level of risk that remains. Different rules apply depending on country of origin, i.e. whether the consignment or passenger has entered the UK from a Member State or another country.

#### **Consistency in enforcement – sharing the regulatory role**

Together with one clear message, delivery partners need to demonstrate a consistency in enforcement. Failure to do so can result in confusion and a good guy vs. bad guy split in the mind of our customers. Proportionate enforcement procedures as well as fines are needed to encourage prosecution where appropriate. Penalties and the prospect of conviction act as a deterrent from deliberate non-compliance, reducing the risk.

## **5.3 Challenging our resilience**

At the workshop with delivery partners and in the interviews with experts a number of concerns with the current control and mitigation of exotic animal disease were identified as potential challenges to our resilience. An outline of these is provided in table 19. These challenges are based on the experiences of frontline officers and behaviours reported to delivery partners as regulators and Defra as policy makers.

**Table 19:** Challenges identified in interviews with experts and the delivery partners workshop

	Challenges
<b>Imports</b>	Deliberate or accidental importation of contaminated illegal material into GB, either because people not aware of rules, or products/animals deliberately have invalid documentation
	Trade triangulation & free trade within EU – not all member states have same level of enforcement at borders and there is the potential for silent spread of disease within new EU countries with less competent veterinary infrastructures
	Unknown/unpredicted trade flows: <ul style="list-style-type: none"> <li>- sudden changes flows due to economic or political factors within the community e.g. importation of animals from BT affected areas in EU because of economic incentives</li> <li>- Unknown seasonal patterns of trade</li> </ul>
	Movement of horses within EU is not fully documented and there are known sources of serious equine infections within EU. Tripartite agreement with France and Ireland opens border to horses from other parts of the EU entering GB via France
	Non-compliance with by-products rules and the escalating use of migrant and foreign workers on farms increases the likelihood of potentially contaminated imports coming into contact with susceptible livestock
	Balancing HMRC / UK Border Agency resource and priorities against risk from products of animal origin
	Enforcement officers expressed concern that they were not being encouraged to take apply penalties as the standard fine was disproportionate to the effort needed to prosecute
	EU post import tests not carried out at border but at point of destination delaying disease detection. In some cases these tests are not carried out as the wrong destination address has been given by the Member State and animals are not traced
	3 <sup>rd</sup> country certification varies and documentation is often inaccurate
	Concern that data can be limited making it difficult to carry out a proper risk assessment of 3 <sup>rd</sup> countries and trade rules mean that GB cannot target checks on specific countries but instead have to target certain importers and exporters
	Non-implementation of the Balai Directive
	The large throughput at ports and the large containers make it impossible to carry out thorough checks, most checks carried out are only doorside and the system is reliant on honesty
	Post and parcels present an unknown risk, as we do not have comprehensive data on the volume of animals and animal products entering GB by this route. There is also a potential for increased risk with growth in the use of alternative couriers to Royal Mail, as we are not sure what checks these companies carry out
<b>Farming practices &amp; behaviours</b>	Non-compliance with standstill rules <ul style="list-style-type: none"> <li>- approx. half (c70k) of all holdings within GB are now part of one of c19k SOAs which exist in GB. Movements within a SOA are exempt from standstill rules.</li> <li>- Movements of livestock between parcels of land owned by the same business tend not to be reported, even if they are a significant distance apart. Farms are becoming increasingly fragmented.</li> <li>- Keepers are ‘collecting’ CPH numbers so that they can register movements under different numbers to avoid standstill rules</li> </ul>
	Unknown level of non-compliance occurring in certain sectors where there are economic drivers which incentivise illegal activity e.g. <ul style="list-style-type: none"> <li>- Ineligible stock going for human consumption</li> <li>- Ineligible stock going for export (sheep disappear off the system and are retagged)</li> <li>- Hearsay evidence that sheep are being illegally slaughtered (on unlicensed premises) and transported to large cities for the trade in smokies</li> </ul>

	<p>Biosecurity behaviours at markets and slaughterhouses – breaching C&amp;D and standstill requirements</p> <p>Non-compliance with transport C&amp;D during peacetime. Controls are seen as too weak as owners have 24hours to clean the vehicle – by which time the damage can already be done</p> <p>Horses are not undergoing pre-export healthchecks before movement because of the cost but no one is enforcing.</p> <p>Local Authorities are not informed of the arrival of imported animals on to premises in their area. This means they are unable to ensure that post import tests are carried out or take the recent importation into account when selecting premises for farm visits</p>
<p><b>Location and distribution of susceptible animals</b></p>	<p>Major gaps in our knowledge about the size and distribution of some susceptible livestock populations in GB because:</p> <ul style="list-style-type: none"> <li>- No requirement to register</li> <li>- Keepers not aware of registration requirements</li> <li>- Only approx. 60% of livestock keepers have land parcels registered with the RPA (actual level varies between species)</li> </ul> <p>Particular challenges include small holders, pigs, horses, camelids, goat industry.</p> <p>Lack of information on sheep movements and individual sheep cannot be identified or traced</p> <p>Potentially large wildlife reservoirs of disease e.g. wild boar population, which we have little information on</p> <p>Unable to control the migration of wild birds and can only monitor migration routes and carry out surveillance</p> <p>Small, unregistered keepers are less aware and less likely to take biosecurity measures</p>
<p><b>Laboratories</b></p>	<p>Unsolicited importation of diagnostic samples and other biological material into GB laboratories which may be badly packaged and contaminated with exotic pathogens. General movement of biological material for research is not covered under legislation which is restricted to import.</p> <p>Large number of facilities (c350) in GB licensed to handle category 3 pathogens and movement of material between these facilities for research purposes.</p> <p>Availability of ongoing government funding to maintain equipment and facilities at reference laboratories in accordance with new HSE requirements. Disposal of pathogens at facilities in which licences have expired</p> <p>Organisations, institutions (such as museums) and individual researchers often think the material they are importing is exempt from restrictions</p>
<p><b>Enforcement</b></p>	<p>HSE now responsible for enforcement of all laboratories. They are unifying previous ACDP &amp; SAPO classifications and risk based inspection processes. There are concerns that the new unified regime may favour human pathogens over animal ones.</p> <p>Defra has no legal power over the bodies enforcing movement legislation i.e. local authorities. We are unable to address inconsistencies or inadequate levels of enforcement (different Local Authorities give different priorities to animal health activities).</p> <p>Lack of structured, regular feedback from enforcement bodies e.g. Animal Health, Local Authorities about nature and level of high risk behaviour occurring in the field</p> <p>Concern expressed that gaps which may occur as a result of HMRC transferring some of its responsibilities to the UK Border Agency (UKBA)</p> <p>Feed control legislation is seen as unenforceable</p> <p>Standstill system is too complex – there are too many derogations and too many enforcement bodies involved</p>
<p><b>Policy</b></p>	<p>Changes to policy (or enforcement of policy) which disturb production patterns (introducing unknown levels of risk into current practices; or new policy which conflicts with existing AH policy</p> <p>Pressure to ‘lift’ restrictions during outbreaks for economic reasons may lead to veterinary controls being lifted sooner than ideal from disease control perspective</p>

	<p>Complex and poorly understood legislation has led to unenforceable policy and incomprehensible guidance</p> <p>Inadequate funding and resources to mitigate and control all risks. Competing and different priorities of the delivery partners involved can lead to inconsistency rather than joined up policy making and targeted risk management.</p>
<b>Systems</b>	<p>Livestock reporting systems are complex and no longer fit for purpose. They do not provide an accurate picture of the location of livestock, the timing of movements or the level of non-compliance. The CPH identifier is no longer a reliable way of referencing locations or holdings.</p> <p>Poor IT systems make it impossible to share data – resulting in a lack of local intelligence, duplication and inconsistency in enforcement.</p>

## 5.4 Strengthening our resilience

Exotic disease control and mitigation involves continuously identifying ways and putting in place measures to strengthen our resilience to an exotic disease outbreak. This can be enhancing or introducing controls, or improving our preparedness to respond where a level of residual risk remains. This section covers the former. Separate work is being carried out by the Exotic Disease Policy Programme on emergency preparedness and how our level of preparedness can be assessed and managed.

### 5.4.1 The Framework

Local authorities are responsible for enforcing the majority of animal health and welfare legislation in England and Wales on behalf of Defra and Animal Health. Following the Foot and Mouth outbreak in 2001, efforts were made to support and co-ordinate this work, by means of providing funding for additional work together with the development of a Framework for Animal Health and Welfare Agreement, which set out general principles to be applied to the working relationship and the tasks to be done.

Following the publication in 2006 of David Eves' review of the animal health and welfare delivery landscape in England, a commitment was made to significantly revise the Framework, and a collaborative project involving Animal Health, Defra, LACORS (on behalf of Local Authorities) and the Welsh Assembly Government was set up. Consultation followed, and a final draft was produced in November 2008. The new Framework is very much centred on partnership working. It will come into effect on 1<sup>st</sup> April 2009, and is designed to work in conjunction with the National Indicator for animal health (NI 190, one of the 198 national indicator set, which is intended to allow central government to monitor local government activity). Each Local Authority is expected to produce and agree a service delivery plan, which lays out the work to be done during the year.

The Framework is intended to function as a source of guidance to all partners involved in its production. Roles and responsibilities, together with intended outcomes, are clearly defined. Critical Control Points for animal health (Markets, collection and assembly centres, dealers, high risk farms, ports, slaughterhouses and data input) are identified, and minimum standards to be achieved in all areas of work are laid down. The Frameworks main content is an activity matrix covering all animal health work areas. It also provides a voluntary activity matrix for animal welfare.

A system of governance is also defined, so that future problems and amendments can be dealt with jointly by all the partners.

### 5.4.2 Livestock Movements Unit study and Livestock Information Strategy Review

A pilot study has been conducted to test the feasibility of the proposals made in the Review of Livestock Movement Controls (Madders) relating to the way land is recorded. The Madders review suggested that all land and buildings used as part of a livestock business in England be registered and recorded centrally. Madders proposed that land and buildings under the same

management and control, between which livestock is regularly moved, should be linked together on an epidemiological basis. This would enable livestock movements to take place within the unit without being reported centrally or recorded in on-farm records.

In recognition of the importance of some of the issues relating to livestock location and customer information, and the complex relationships between numerous systems using this information a short-term review of Defra's Livestock Information Strategy was commissioned. The review was initiated by a senior level group whose role is to ensure that any proposed changes to the way this data is collected does not undermine the integrity of data across the Defra family and beyond. The Group has accepted that the current system of recording livestock holdings (County Parish Holding numbers) is so deeply embedded in the various systems dealing with livestock that it would be prohibitively expensive to move to a completely new system. This being so the Group has asked Animal Health to prepare a business case to examine the benefits of "cleansing" CPH numbers so that fields and buildings associated with them can be recorded along the lines recommended by the Madders Review.

#### ***5.4.3 Animal Health's enforcement strategy***

In parallel with the development of their broader corporate strategy, Animal Health has been looking at the way in which they and their regulatory partners enforce the legislative framework. They have developed a draft Enforcement Strategy which identifies the overarching goal of enforcement as 'ensuring that the regulatory framework functions effectively in delivering positive outcomes in the areas that we regulate'. The strategy contains four strategic objectives: high levels of compliance, economic activity, proportionality and transparency. Under these objectives there are also a number of specific aims:

- Partnership working and engagement
- Making the best use of data
- Improving the legislative framework
- Guidance and best practice
- Fostering a regulatory culture.

#### ***5.4.4 Actions from a delivery partner perspective***

The participants at the delivery partners workshop also considered what action might be taken to address the challenges they had identified to strengthen our resilience. These were prioritised as actions that 'must' take place, 'should' take place and 'could' if resources allowed.

Table 20, below, highlights some of actions that could be taken to improve the management of the pathways from a delivery partners perspective. Stage 2 of the project will look in more detail and discuss with a range of experts and stakeholders, possible solutions to address the challenges and maintain our resilience to the threat of an exotic disease outbreak.

**Table 20: Suggested actions from the delivery partners workshop**

Must	Should	Could
Maintain the profile and awareness of diseases	Link into public health authorities on zoonotics	Carry out regular visits to remote transit sheds in case animal products have been sent by mistake
Informs Local Authorities of import consignments to their area and provide officers with training	HSE should talk about Eastern European workers	Communicate clear guidance summarising roles and responsibilities
Review VRA for C&D of vehicles and if a risk strengthen controls	Train farmers in biosecurity and imports legislation	Education campaign targeting lorry drivers to prevent personal illegal imports of food in cabs
Publish an overview of new legislation on Defra's website and raise awareness with Local Authorities via LACORS	Rationalise responsibilities for feed controls	
Influence the EU to ensure other Member States use TRACES properly; to simplify EU legislation; and introduce a training programme for 3 <sup>rd</sup> country officials on the EU standard	Introduce better systems to record movements and locate non-food species, i.e. horses	
Ensure LAs understand their role and the roles of other delivery partners	Improve communications with horse industry	
Ensure LAs know what they have in their area	Introduce central recording requirement for sheep – batch movements	
Undertake more risk based checks alongside 'reality checks' – designed to pick up new risks	Review legislative package around animal health controls	
	Increase inspection rates of large containers – need to look at how to provide an incentive	
	Influence FSA to ensure that list of approved addresses for products for human consumptions is provided and enforced	
	Feedback intelligence to Brussels to give the Commission the full picture	



## 6 Key Findings and Recommendations

Our resilience is our ability to reduce and manage the risk of an exotic disease outbreak. It is our enforcement and delivery of exotic disease prevention controls, and surveillance of animal disease both within GB and internationally.

### 6.1 Assessing our Resilience

The workshops, interviews and research provide a snapshot of the current controls and our management of risk pathways. Just as the identification of the priority risk pathways in the first workshops has driven this study, a high level assessment of our resilience along these pathways will provide a focus for the remainder of the project. Table 21, below, summarises the specific challenges to resilience identified in the workshops and interviews against the priority risk pathways.

Figure 22: the criteria considered when assessing our resilience against each of the high probability pathways



**Table 21:** Challenges identified in interviews with experts and the delivery partners workshop mapped against the critical control points on the high risk pathways

Challenges identified in the high risk pathways		
Critical Control Points	Resilience target	Challenge
Imports of live animals, animal products, germplasm and laboratory or other pharmaceutical material	Illegal imports of live animals and / or contaminated material – deliberate or accidental	<ul style="list-style-type: none"> <li>Perceived view that HMRC resource and priorities are not animal products</li> <li>Enforcement not encouraged by inadequate fines</li> <li>Personal imports of migrant workers – carrying food onto farms – is an increasing risk</li> </ul>
	EU imports	<ul style="list-style-type: none"> <li>Varying levels of competency of veterinary infrastructures across the EU</li> <li>Lack of common standard of enforcement</li> <li>EU post import tests not carried out at border but at destination delaying identification of disease</li> <li>EU post import tests not happening as wrong destination addresses are being given by Member States</li> <li>Non implementation of the Balai (the “catch all”) Directive</li> </ul>
	3 <sup>rd</sup> Country imports	<ul style="list-style-type: none"> <li>Standard of veterinary certification varies and can be unreliable</li> <li>Descriptions are often inaccurate and products/animals can deliberately have invalid documentation</li> <li>Unable to properly risk assess 3<sup>rd</sup> countries because of inadequate data</li> <li>Unable to target checks of commercial imports from specific countries, can only target exporters</li> </ul>
	Ports	<ul style="list-style-type: none"> <li>Large throughput of imports make it impossible to check all, making the system reliant on honesty</li> <li>Large containers mean that checks are often only doorside</li> <li>Easy to drive over with a van load of illegal animals – most likely to happen for pet trade</li> </ul>
	Post and Parcels	<ul style="list-style-type: none"> <li>Unknown risk, unknown volumes</li> <li>Potential increase of risk with the growth in the use of couriers as an alternative to the Royal Mail</li> </ul>
	Laboratory and pharmaceutical material	<ul style="list-style-type: none"> <li>Unknown risk if imported by post</li> <li>Organisations, institutions (such as museums) and individual researchers often think the material is exempt</li> </ul>

Vehicles from abroad which have been carrying animals	Cleansing and disinfection	<ul style="list-style-type: none"> <li>• Non-compliance with C&amp;D controls during peacetime</li> <li>• Controls are too weak – 24hour window to carry out C&amp;D too lax</li> <li>• No one inspects the cleanliness of returning military vehicles</li> <li>• Personal supplies of lorry drivers' often go unchecked</li> </ul>
Importation and movement of horses around GB	Information and monitoring of horse movements	<ul style="list-style-type: none"> <li>• Lack of traceability – movement of horses within EU not fully documented</li> <li>• Horses not undergoing health checks prior to movements within the EU because of cost – health checks not being enforced</li> <li>• Too many passport issuing bodies</li> <li>• Tripartite agreement opens GB border to horses from France which may have come by land from elsewhere without health checks being carried out</li> </ul>
Food waste from retail and the food processing industry	Animal feed	<ul style="list-style-type: none"> <li>• Feed control legislation is seen as unenforceable</li> </ul>
Migration of wild birds	Bird movements	<ul style="list-style-type: none"> <li>• Unable to control migration and can only monitor routes</li> </ul>
Movement of livestock around GB: farms, markets and other gatherings	Standstill controls Movement reporting identification	<ul style="list-style-type: none"> <li>• Lack of information on sheep movements</li> <li>• Livestock identification compliance – in particular cattle and sheep</li> <li>• Standstill system is too complex – too many derogations and enforcement bodies involved</li> <li>• Non-compliance with standstill rules – movements with SOAs</li> <li>• Loopholes in movement controls mean movements go unreported and unrecorded – issuing multiple CPH numbers, fragmentation of farms</li> <li>• CPH identifier no longer a reliable reference for locations or holdings</li> <li>• Rare breeds are more vulnerable as they are likely to attend more gatherings / shows</li> <li>• Local Authorities are not informed of the arrival of imported animals on to a premises so that it can be taken into account when selecting farm visits</li> </ul>
Contact between livestock, competent vectors and susceptible wildlife populations / reservoirs	Biosecurity on premises	<ul style="list-style-type: none"> <li>• Small unregistered keepers are less aware and less likely to take biosecurity measures</li> <li>• Potentially large wildlife reservoirs of disease which we have little information on</li> </ul>

### **6.1.1 Methodology**

In order to assess and compare our resilience for each pathway a set of criteria has been developed. The criteria used are listed below. In developing the criteria the objective was to consider the factors which should be taken into account when quantifying the resilience of the pathway and the level of remaining risk. The aim of assessing the resilience of each pathway was to present the Exotic Disease Policy Programme Board with a high-level review of the exotic disease risk, identifying challenges to our resilience for further consideration.

As well as assessing the risk, based on likelihood and impact, other factors were taken into account, such as the immediacy of the challenge, the level of stakeholder interest and the confidence in our existing evidence base. The assessment therefore considered other drivers which may make the pathway a priority for further work.

#### **Likelihood and impact – to what extent is the pathway unaffected by exotic disease(s)?**

This indicator highlights the number of exotic diseases which can exploit the pathway. It is based on the output from table 15 (section 3). For this assessment it has been assumed that all the diseases in scope have an equal importance. This is unlikely to be the case but in the absence of the disease prioritisation tool the project is unable to differentiate at this stage. This will need to be reviewed when validated profiles are available from the disease prioritisation Tool later in 2009.

#### **Controls – how effective do experts think current countermeasures are?**

All of the pathways identified are already controlled and/or monitored in some form. This measure indicates our confidence in the effectiveness of existing risk management controls and their enforcement. The assessment is based on the output from table 18 (section 4.5). Whether we think the risk posed by the pathway is effectively managed will have a significant impact on our degree of resilience to an exotic disease outbreak.

#### **Evidence – what level of confidence do we have in our evidence base?**

Our assessment of the risk and the effectiveness of current countermeasures is based on a number of sources of evidence for the different pathways. This indicator is a qualitative reflection of our confidence in our current evidence base, i.e. are we solely relying on anecdotal evidence from interviews and the workshops or is there other data that has been drawn upon. This indicator therefore helps to set the context and highlights the assumptions that have been made. It will be for the Programme Board to decide whether it is content to make a decision using this evidence base, or whether further research is needed before work on the pathway is taken forward.

#### **Reasons for intervention – what level of control does Defra have for this pathway?**

This indicator is used to highlight the fact that Defra may not have primary responsibility for the pathway. In some instances Defra's delivery partners may have more of a driving role, in others the policy will be decided by the EU and our role will be as a major influencer. Our level of control will affect what measures we can take, or direct others to take, to strengthen our resilience along the pathway.

#### **Reasons for intervention – to what extent do experts think current behaviour is appropriate?**

In terms of recommending the focus of the project and prioritising areas for further work the immediacy of the challenge needs to be taken into account. This indicator highlights how current behaviour may be causing concern and picks up on the non-compliance factors assessed in table 18 (section 4.5). It has been drawn out separately here to enable the Programme Board to take the decision, where necessary, to start work to address concerns before the final report from this project. It may also help planning short, medium and long term objectives.

**Wider consideration – what is the level of pressure from stakeholders / the public for intervention?**

This indicator highlights what we know our stakeholders think about the management of the pathway. This can include Ministers, delivery partners, industry, NGOs and the public. Again stakeholder perception needs to be considered when looking at risk management.

**Wider consideration – to what extent does this align with existing priorities?**

This indicator enables the Programme Board to see how well potential concerns with the pathway may fit with the broader priorities of the programme, Defra and the EU. Alignment with other existing objectives will be considered when the Programme Board prioritise further work.

**Wider consideration – is the risk likely to increase over time?**

This indicator is concerned with horizon scanning and will be used to highlight to the Programme Board that the pathway may become of increasing concern in the future. The board will then be in a position to take a decision whether something needs to be done now to reduce that risk, or whether action can wait.

The assessment against each criteria has been used to calculate an overall resilience rating for the pathway given by the project team. This forms the basis of the recommendations for the focus of the project in its final stages and areas for further work, as set out in section 6.2, for the Programme Board to consider.

**6.1.2 The comparison**

Table 22 below is the project's assessment of the level of resilience for each of the high likelihood pathways. The following table (table 23) contains the definitions used in assessing whether each pathway was high, medium or low in response to the criteria questions. Finally table 24 provides an explanation of the overall resilience rating score. Some if not all of these descriptors will be relevant to the overall assessment rating of high, medium or low. Section 6.1.3 outlines the project team's thinking, discussion and assumptions in rating the pathways.

**Table 22: Level of resilience of each of the high probability risk pathways**

Resilience Criteria	Priority Risk Pathways											
	Imports of livestock or pets	Imports of meat	Imports of germplasm	Imports of laboratory material	Livestock transport vehicles	Importation & movement of horses	Waste from retail / food processing	Migration of wild birds	Movement of livestock around GB	Contact between livestock & wildlife	Contact between livestock & competent insect vectors	
<b>Likelihood &amp; Impact</b>												
To what extent is this pathway unaffected by exotic disease(s)?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
<b>Controls</b>												
How effective do experts think current counter-measures are?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
<b>Evidence</b>												
What level of confidence do we have in our evidence base?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
<b>Reasons for intervention</b>												
What level of control does Defra have for this pathway?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
To what extent do experts think current behaviours are appropriate?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
<b>Wider consideration</b>												
What is the level of pressure from stakeholders / the public for intervention?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
To what extent does this align with existing priorities?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
Is the risk likely to increase over time?	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
<b>Overall resilience rating</b>	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●

Key: ● ● ● High    ● ● ● Medium    ● ● ● Low



## Definitions of High / Medium / Low by criteria

The definitions below were used to measure and categorise the different pathways against the resilience criteria.

Table 23: The definitions used to rate the pathways high, medium or low against the criteria

	Likelihood & Impact	Controls	Evidence	Reasons for intervention Measures	Reasons for intervention Immediacy	Wider consideration Stakeholder / public pressure	Wider consideration Priority alignment	Wider consideration Horizon scanning
<b>High</b> 	Less than 5 exotic diseases can exploit this pathway (table 15 output)	We are confident in our counter-measures and they are considered effective by delivery partners &/ or policy leads (table 9 output)	We are confident in our evidence base & are in a position to make recommendations	Defra is responsible for the management and control of the pathway	Current behaviours associated with this pathway do not undermine the prevention of an outbreak	There is significant pressure from industry/ delivery partners / the public to intervene in the management and control of the pathway	Strong alignment with a) Defra's b) EDPP's and/ or c) EU's priorities	Likelihood of a priority disease exploiting this pathway will increase over time
<b>Medium</b> 	5 to 10 exotic diseases can exploit this pathway (table 15 output)	Counter-measures are adequate but areas for improvement have been identified by delivery partners &/ or policy leads (table 9 output)	We have some evidence – mostly anecdotal – to make an indicative recommendation that needs to be strengthened by further data collection and/or research	Defra is one of the principle partners responsible for the management and control of the pathway	Current behaviours associated with this pathway question our resilience to preventing and controlling an outbreak	There is some pressure from industry/ delivery partners / the public to intervene in the management and control of the pathway	Some alignment with a) Defra's b) EDPP's and/ or c) EU's priorities	Likelihood of a priority disease exploiting this pathway will remain similar to current risk
<b>Low</b> 	More than 10 exotic disease can exploit this pathway (table 15 output)	Counter-measures have been identified as poor / inadequate by delivery partners &/ or policy leads (table 9 output)	Evidence is poor or and further data collection and/or research is needed for our resilience to be assessed	Defra only has an influencing role in how the pathway is managed and controlled	Current behaviours associated with this pathway seriously threaten our resilience to preventing and controlling an outbreak	We are not aware of any pressure from industry/ delivery partners / the public to intervene in the management and control of the pathway	Little alignment with a) Defra's b) EDPP's and/ or c) EU's priorities	Likelihood of a priority disease exploiting this pathway will decrease over time

**Table 24:** The descriptions for the overall resilience ratings for the pathways

<p>High</p> <p>● ● ●</p>	<ul style="list-style-type: none"> <li>• Fit for purpose countermeasures in place, both in terms of legislation and enforcement</li> <li>• Comprehensive evidence base</li> <li>• High level of understanding and knowledge of how the pathway and risk are managed</li> <li>• Exotic disease risk and how it may change overtime is understood and taken into account in the management of the pathway</li> <li>• Ministers, stakeholders and the public are confident in the way the pathway is being managed</li> <li>• Clear roles and responsibilities are understood</li> </ul>
<p>Medium</p> <p>● ● ○</p>	<ul style="list-style-type: none"> <li>• Countermeasures in place are adequate but improvements may be needed to strengthen resilience and adapt to changes in the risk</li> <li>• Evidence base is mainly anecdotal / based on expert assumptions and needs to be consolidated with hard data</li> <li>• Some understanding and knowledge of how the pathway and risk are managed – but there is some need to improve information sharing and feedback</li> <li>• Some understanding of the exotic disease risk and how it may change over time</li> <li>• Minister / stakeholders / public have expressed some concerns relating to the way the pathway is being managed</li> <li>• Some confusion over roles and responsibilities</li> </ul>
<p>Low</p> <p>● ○ ○</p>	<ul style="list-style-type: none"> <li>• The pathway poses a significant risk and the effectiveness of current countermeasures has been questioned</li> <li>• Little information is available and more data needs to be collected and analysed if the resilience of the pathway is to be understood</li> <li>• Little understanding of how the pathway and risk are managed, and measures to share information and give feedback need to be enhanced</li> <li>• Little understanding of the exotic disease risk and how it may change over time</li> <li>• Minister / stakeholders / public have expressed concern relating to the way the pathway is being managed</li> <li>• Confusion over roles and responsibilities is affecting enforcement and reducing the effectiveness of control measures</li> </ul>

### 6.1.3 The assessment and assumptions

In assessing the pathways against the criteria the project team have made a number of assumptions based on experiences of Ministerial and stakeholder interests, the anecdotal evidence from interviews and workshops, as well drawing on data from the research outlined in the earlier sections of this report. The assumptions made and the justification for doing so are outlined below by pathway.

#### Imports of livestock and pets

This is one of the highest risk pathways as a large number of exotic diseases could potentially enter GB and cause an outbreak by the importation of livestock and pets. The sheer volume of imports coming into GB makes the management and control of this pathway a challenge. In assessing the current controls the team decided that given the scale and the high risk posed by the pathway the countermeasures were largely effective. This is reflected in the low number of exotic disease incursions from the pathway despite the level of risk. With increasing globalisation in international trade and climate change the risk may change over time.

Whilst there is good information available on the numbers of animals imported, the numbers for illegal imports is largely unknown. This is a common problem with non-compliance and only an estimate can be made. However, seizure and non-compliance data is not always recorded and fed back. This gap in our knowledge is reflected in the evidence base ranking.

Imports legislation is largely driven by the EU and Defra's control of the pathway is therefore determined at the EU level, based on an EU assessment of the risk. Defra plays an important part in influencing and shaping these EU decisions, along with fellow Member States. Defra is also reliant on the enforcement of the legislation by a number of delivery partners; those directly part of the Defra family, i.e. Animal Health, and those with broader responsibilities, i.e. Local Authorities.

Political interest remains high and the need to balance the risk whilst maintaining relationships with the EU and other Member States, and reassuring the public and GB stakeholders, can require some careful handling. Given the risk posed, effective management of the pathway is essential if we are to meet the broader objectives of Defra, the Exotic Disease Policy Programme and the EU. The project team consider the resilience of the pathway to be acceptable and further work is not recommended at this stage.

#### Imports of meat and germplasm

In considering these two import pathways the project team saw the issues as being broadly similar to the imports of livestock and pets (see above). The importation of meat and germplasm are seen as posing less of a risk than the importation of live animals as fewer exotic diseases could potentially exploit the pathway, and the risk of contact with a susceptible live animal is reduced. As with the importation of animals legislation controlling both these pathways are largely driven by the EU. As with the live animal imports pathway, the team do not see these pathways as representing a priority for the project going forward.

#### Imports of laboratory material

Based on the number of exotic diseases which could potentially enter GB via the importation of laboratory material this pathway represents a high risk. However the lack of information on the amount of material imported, which may pose a risk, meant the team were unable to fully appreciate the threat. Laboratories throughout GB are responsible for importing an array of materials which may, purposefully or not, be contaminated with an exotic disease. Whilst the team felt that the management and control of SAPO licensed establishments was good, the control of the import before it reached its point of destination was questionable

with little information or knowledge in Defra of the checks in place for material sent by post or courier.

The importation of materials to non-SAPO licensed establishments was also seen as a risk, as the team had no knowledge of what was being imported, the volumes or the destination points. Concerns have been expressed by the research community who fear that a more robust enforcement of importation requirements may cause more paperwork. As such Defra is under pressure to leave the control of the pathway as it is. There is no information about checks on materials destined for residential addresses.

Given the lack of information and the high risk of the pathway the team has decided that immediate action is required to better understand this pathway.

#### Livestock transport vehicles

Dirty livestock vehicles crossing the GB border from abroad are seen as the potential route for a high number of exotic diseases entering the country. The risk of causing an exotic disease to spread is also high, as the likely destination for the vehicles is a GB farm or market.

One of the outputs from the delivery partners workshop was that during peacetime Cleansing & Disinfection (C&D) checks on livestock vehicles are not vigorously enforced and compliance amongst the farming community is generally low, including for internal GB movements which may cause a disease to spread between premises. Checks on vehicles are not recorded and returned to Defra, so there is little information to form a hard evidence base other than this anecdotal feedback.

Some stakeholders are concerned that C&D of vehicles is perceived as causing an unnecessary burden. However, given the disease risk, the acknowledged low levels of enforcement and the lack of compliance the team has identified the pathway as requiring immediate action to better assess our resilience and the real threat posed.

As discussed in chapter 5 this pathway has been expanded to reflect anecdotal evidence of C&D compliance and enforcement for livestock vehicle movements within GB.

#### Importation and movement of horses

Whilst fewer exotic diseases can potentially exploit this pathway the team's main concern was the lack of information for a large proportion of the horses in GB. Whilst the movements of racehorses could be traced based on information from the British Racehorse Society there are large gaps in the evidence base for all horses, donkeys, ponies etc.

To a large extent the importation and movement of horses has traditionally been self-regulated by the horse industry which is perhaps why there is less information held centrally by Defra. This is a cause of concern for some. The tripartite agreement in particular had been identified as a potential threat to the resilience of this pathway at the delivery partners workshop, a concern which has since also been expressed by World Horse Welfare.

Despite our low level of control of the pathway and low evidence base, the horse is of high political interest. The project team concludes, that despite its medium resilience rating, that the Exotic Disease Policy Programme investigates this pathway as part of its medium term look at resilience work.

#### Catering and food processing waste

The team decided that this is a highly regulated pathway given the risk posed. Little information on volumes etc has been collected but the team were reasonably confident that

the pathway is being effectively managed by Defra's delivery partners: Animal Health, Local Authorities and the Environment Agency.

Many of the controls in place have been driven by the lessons learned from FMD 2001. Today controls are fully embedded and concern around the pathway has been significantly reduced. Swill feeders continue to be interested in the controls. Generally there is an acceptance that animal matter and animal-contaminated matter should not be fed to farmed animals and as such the team has decided that the pathway is resilient with no further action recommended at this stage. Other waste streams, such as international catering waste from ships and aircraft, which were identified as posing a low likelihood risk have not been assessed in our report and will need to be considered in follow up work to this project.

#### Migration of wild birds

This pathway represents a relatively low priority as only a few exotic diseases can potentially be carried and spread by wild birds. Whilst little can be done to control or intervene in the movements of wild birds there is still some political interest given the media coverage of avian influenza in 2006 and 2007. The pathway continues to be monitored as part of the UK Surveillance Strategy and bird keepers are encouraged to practice high levels of biosecurity and to keep vigilant for any signs of disease. Given the low number of exotic diseases which can exploit the pathway and the practical restrictions in taking any additional measures than those already in place, the project team has not recommended that further work is needed for this pathway.

#### Movement of livestock around GB

The movement of livestock is a high risk pathway for the potential spread of a large number of exotic diseases around GB. Existing movement controls are undermined by low levels of compliance and difficulties around enforcement. Derogations to the standstill regime and the creation of SOAs add to the complexity of delivery arrangements and data recording. With this in mind the team has decided that the current countermeasures need to be reviewed. This is supported by the outputs of the interviews and workshops, and the research into SOAs.

Whilst we have lots of data on livestock movements, the number of CPHs issued and SOAs, information on levels of compliance and enforcement of movement controls is limited. The delivery framework for movement controls is complex, involving a number of delivery partners and a number of different systems to record information.

Alongside concerns about the lack of accurate information and a comprehensive understanding of compliance the C&D of vehicles which the livestock may be moved in is an issue. As with livestock transport entering GB and moving on to farms from abroad the enforcement of C&D checks for vehicles moving within GB is reputedly low.

There is some political interest but the pressure from stakeholders generally is to relax movement restrictions rather than strengthen them further. However, the team is concerned that the creation of large SOAs, and other exemptions, are communicating to the livestock industry that the risk is less significant than was thought post FMD2001 and that we are indirectly encouraging non compliant behaviour. There is also little knowledge about the activity and location of certain livestock sectors e.g. pig locations, camelid keepers and the goat industry. This pathway represents a significant risk and the team believe it requires immediate action to build its resilience.

#### Contact between livestock & wildlife

Like the migration of wild birds this is a difficult pathway to control and manage. However, unlike wild birds a large number of exotic diseases could potentially exploit this pathway to reach our farmed livestock and cause an outbreak. In particular diseases potentially carried

and transmitted by wild boar, deer, semi feral equines and sheep. Current countermeasures are guidance on on-farm biosecurity but this is not a measure that is formally enforced and we know very little about the extent to which it is complied with.

As there is no legal bite to the guidance, Defra has little control over this pathway and its current role is to influence the behaviour of farmers. Diseases in wildlife are monitored as part of our Surveillance Strategy, as with AI in birds, however data quality varies and we are reliant on members of the public reporting on mammals.

The high level of political interest is stemmed by experiences of managing the perceived conflict of interest in bovine TB and badger conservation. There is some pressure from stakeholders for Government to intervene in the distribution and the apparent growth in some wildlife populations, in particular wild boar.

Whilst contact between livestock and wildlife is difficult to manage the project team recommend that the resilience of this pathway is assessed more fully.

#### Contact between livestock & competent insect vectors

Another pathway which is difficult to manage and control. Insect vectors pose less of a threat in terms of the number of exotic diseases which could be transmitted and / or spread than the wild animals stated above. Guidance is available on reducing the risk of contact with flying insects in relation to Bluetongue. However, as with the biosecurity guidance this is not a legal requirement and currently there is no real evidence of the benefits of taking these measures. It should also be noted that there are risks involved in applying some of these measures, particularly water body contamination by insecticidal products. Whilst approved under Pesticides legislation, an increase in their routine use could increase the likelihood of isolated incidents.

Political and media interest is fairly low as it is recognised that little can be done to reduce the likelihood. Some stakeholders would like insect population distribution and movements to be mapped in more detail, but the added value of such work in assessing and managing risk for significant extra cost is debatable, since there is little Government can do to intervene. Whilst the risk is likely to increase with predicted changes in the climate the team do not feel that much more can be done to increase our resilience along this pathway at present.



## 7 Initial Analysis

### 7.1 End of Stage 1: Priority Pathways

Following the assessment of the resilience of the 11 high probability pathways it was clear that there were four priority pathways that required more detailed consideration during the remainder of the allocated time of the project. These were:

- Imports of laboratory material
- Livestock transport vehicles from abroad (now expanded to include internal movements)
- Livestock locations and movements around GB
- Contact between livestock and wildlife

For each pathway a number of recommended actions were identified for the project to take forward. The table below outlines these actions and demonstrates how taking them forward will build the resilience of the pathway:

Table 25: Recommended actions for stage 2 of the project

Pathway	Recommended Action	Resilience criteria
Imports of laboratory material	<b>R1a</b> Build an evidence base in discussion with Royal Mail, research institutions	Increase our confidence in our evidence base & our understanding of counter-measures & their enforcement
	<b>R1b</b> Discuss with postal and courier service providers and research institutions possible measures to reduce the risk	
	<b>R1c</b> Ensure future laboratory inspection regime prioritises animal pathogens	
Livestock transport vehicles	<b>R2a</b> Review the veterinary risk assessment for Cleansing & Disinfection of vehicles – both internal movements and vehicles from abroad	Increase our confidence in our evidence base to assess the risk & effectiveness of counter-measures
	<b>R2b</b> Assess if controls need to be more rigorously enforced or strengthened in discussion with Animal Health, Local Authorities and the livestock industry	
Livestock movements around GB (farms and animal gatherings)	<b>R3a</b> Review model for 6-day standstill and impact of SOAs and other exemptions	Understand the effectiveness of counter-measures & the associated risk, look to improve risk management
	<b>R3b</b> Assess whether existing controls remain effective and seek possible solutions with Animal Health e.g. DVM review of current SOAs, review of biosecurity at markets	
	<b>R3c</b> Investigate level of movement recording across Local Authorities	
	<b>R3d</b> Investigate level of cattle and sheep id compliance	

	<b>R3e</b> Commission studies to further understand certain livestock sectors e.g. pig, goat and camelid industries	
<b>Contact between livestock &amp; wildlife</b>	<b>R4a</b> Commission veterinary risk assessments to review the risk posed by wildlife <b>R4b</b> Discuss with livestock industry possible measures and solutions to improve on-farm biosecurity	Understand the risk & look to improve risk management

## 8 Review of the Priority Pathways

The resilience assessment identified four priority pathways for the project to consider in phase 2. From this assessment a number of recommendations were made to enable us to better understand our resilience to the threat of an exotic disease exploiting these pathways. In particular to:

- Increase our confidence in the evidence base
- Increase our understanding of the countermeasures – their effectiveness and enforcement
- Better understand behaviours and levels of compliance
- Assess and/or re-assess the risk to better inform our priorities

The section below reports our findings from further evidence gathering and discussions with Defra policy leads and veterinary experts, delivery partners, organisations and industry as appropriate.

### 8.1 Collecting the evidence, understanding the risk and investigating existing controls

#### 8.1.1 Recommendation 1 – Imports of Laboratory Material

*R1a Build an evidence base in discussion with Royal Mail, HSE and/or research institutions*

*R1b Discuss with postal and courier service providers and research institutions possible measures to reduce the risk*

Within GB, the transport of dangerous goods is regulated by several bodies – the Health and Safety Executive (HSE), the Vehicle and Operator Services Agency (VOSA), the Police Force and the Department of Transport, who are involved in setting the legislative framework.

There are specific notification requirements for high hazard human pathogens, which HSE is notified of before the transport occurs. The transport of other human pathogens is not notifiable but the European agreement concerning the international carriage of dangerous goods by road (ADR) and the carriage of dangerous goods regulations apply. Defra is responsible for dealing with notifications of the non-zoonotic animal pathogens covered by SAPO and the licensing of imports under IAPO (see chapters 3 and 4). Before work starts with animal pathogens covered by SAPO, a license is required which would involve an inspection by HSE before the license is issued.

During inspections of laboratory facilities the HSE specifically look at the transport of specimens and waste on site, and to other laboratories or waste disposal premises. They also look at the overall arrangements for training, packaging, transport and supporting documentation. HSE will be embarking on a benchmarking exercise in the near future, where they will look at specific containment issues as part of the inspections, and transportation is one of the issues being considered to target.

Under Post Office regulations, diagnostic and laboratory material (including environmental and medical waste) which is known or suspected to contain infectious substances in risk group 4 is prohibited in the international and national post, as is selected risk group 3 material. The classification criteria for these risk groups are laid down in the Control of

Substances Hazardous to Health Regulations. Diagnostic specimens and infectious substances which are allowed in the post must always be sent in packing that complies with instructions laid down by the Department for Transport and the HSE.

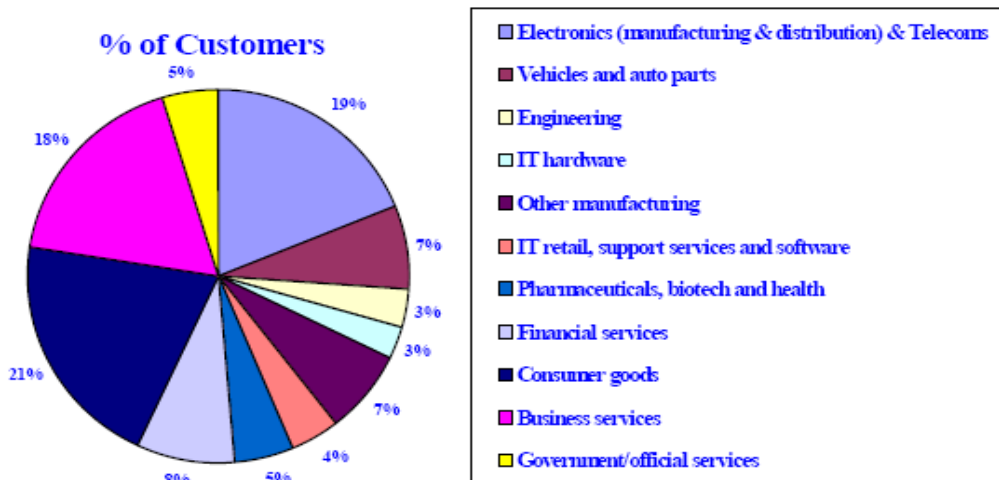
This restriction probably contains most legal trade of this material, and discussions with the UK Borders Agency (UKBA) at the Royal Mail depot in Mount Pleasant, which deals with international letters and small packets, highlighted that transportation and seizures of diagnostic or laboratory materials is extremely rare. The UKBA carry out checks on products of animal origin from third countries, i.e. non EU Member States. Dried fish and meat products e.g. smoked sausage, beef jerky, are the main products of animal origin which are seized. Checks on post from EU Member States focus on drugs, cigarettes and other contraband. Parcels which come through the international post are labelled with a 'customs declaration label' and a description of the contents, and are screened and/or physically inspected by Royal Mail staff. Suspect packages can be seized and opened by UKBA officers as necessary, and referred back to a Border Inspection Post.

Large parcels which come through the international mail arrive at the Parcelforce depot in Coventry. This depot handled and screened just under 8 million packages in 2008. As with the depot at Mount Pleasant, laboratory or diagnostic specimens are rarely seen, but if found they are either referred back to a Border Inspection Post or held until an appropriate licence is granted and they can be released.

In addition to the international and national postal service, private couriers otherwise known as express operators, offer a fast, guaranteed, door-to-door transport and delivery service for documents, parcels and merchandise goods. Shipments are tracked and controlled by the operators throughout the journey. Express transportation is achieved by using a variety of different modes; lorries, vans, trains, passenger aircraft and freight aircraft as well as on-foot delivery. The most important express hub airports in GB are Nottingham East Midlands and London-Stansted. Express operators guarantee a rapid delivery, which despite the increased costs involved, makes them a favourable option for the transportation of low weight, perishable goods such as laboratory test materials and diagnostic specimens.

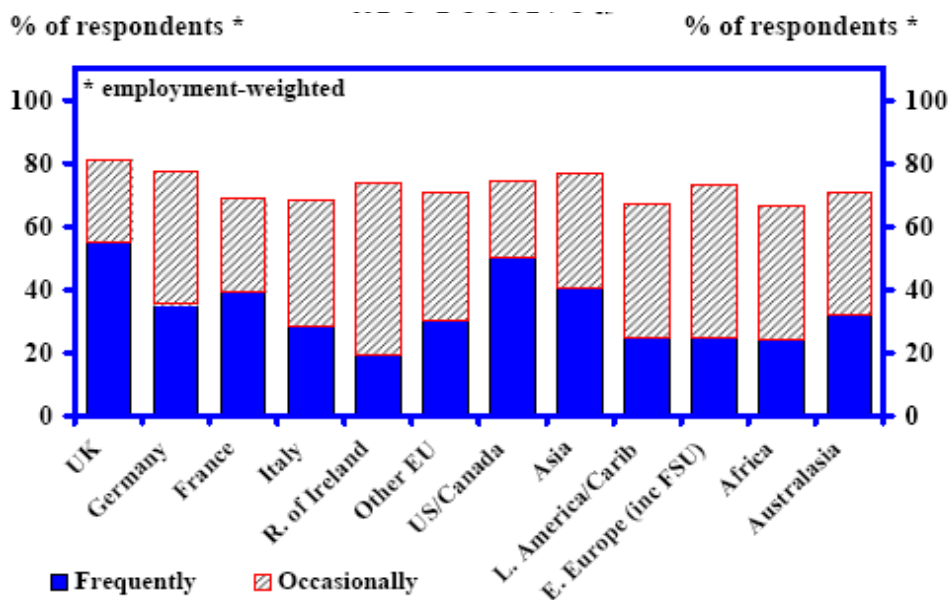
Four companies - DHL, TNT, FedEx and UPS are the main leaders of the global express industry, but there are many other companies involved. Defra has consulted with three of the main operators in the production of this report. All the main operators are transporting products of animal origin and pharmaceutical products. In 2004 the four main companies transported around 160 million express shipments to, from and within the UK. Of these, 25 million were international inbound and 111 million were domestic shipments. Only 25% of these shipments were documents, figure 24 provides a breakdown of the main client sectors of this industry.

Figure 23: Breakdown of the main client sectors of the express industry (source – survey by Oxford Economic Forecasting in 2005)



Where express shipments cross international borders, the operator is responsible for handling customs clearance as well as the payment of duties and taxes as required. Operators are aware of the content of the packages before transportation because a clear description of the goods has to be provided to the receiving country before the goods can be exported and the courier will agree to transport the goods. Figure 25 shows the destinations from where express parcels are received.

Figure 24: Destinations from where express parcels are received (source – survey by Oxford Economic Forecasting in 2005)



The express operators each have their own procedures and methods for monitoring and screening imports and automatically withhold goods that are restricted/prohibited, either for inspection by veterinary officer at a border inspection post or further documentation checks. Some operators e.g. DHL, have specialist teams trained on imports of products of animal origin, physically checking all shipments.

The Association of International Couriers and Express Services (AICES) is a UK trade organisation for companies handling international express documents and package shipments. Membership includes DHL, FedEx, TNT and UPS. AICES acts as a focal point and representative body in negotiations between the industry and Government and other official regulatory bodies. They also aim to improve and maintain professional standards within the industry. AICES works closely with the UKBA to help facilitate quick and efficient completion of customs procedures. They have a Customs Committee and regularly meet with customs officials at a policy and operational level to discuss issues of mutual interest.

The Scientific Research Licensing project currently being carried out by Defra's Imports Policy Team is seeking to simplify the licensing regime for imports of animal products for research and diagnostic purposes. The existing regime is considered to be overly complex and not proportionate to the risk posed by certain categories of products. By simplifying the regime to bring three pieces of domestic legislation under one regime and deregulating negligible risk products it will be easier for laboratories and research institutes to comply and, therefore, should help reduce the risk. The project also intends to work to raise public awareness to ensure that, as with personal imports, people do not unwittingly bring animal products for research or diagnostic purposes into the country. This project is due to complete in 2010.

#### *R1c Ensure future laboratory inspection regime is implemented in line with Callaghan*

A review (chaired by Sir Bill Callaghan) of the regulatory framework for handling animal pathogens was commissioned as a result of the investigations into the Foot and Mouth Disease outbreak in Surrey in 2007. The report of this review was published in December 2007. This review recommended, amongst other things, that responsibility for inspection and enforcement of animal pathogen laboratory containment should pass from Defra to the HSE, that there should be a single regulatory framework for human and animal pathogens, and that these changes should be phased. The Government, including Devolved Administrations, accepted all of the recommendations.

Arrangements for HSE to fulfil the role as inspection and enforcement body for specified animal pathogens continue to work well and provide Defra with a high level of assurance on containment of these pathogens. HSE are either able to provide or draw on the necessary technical expertise relating to detailed aspects of laboratory containment in carrying out their inspections. They are also able to exercise their enforcement powers as necessary according to their general guidelines and the position they find during inspections. They continue to provide Defra with proportionate advice on licensing conditions, whether or not a licence should be issued or renewed, and associated issues. This provides Defra with a high level of assurance that SAPO laboratories continue to be regulated to a high standard.

Stakeholders have welcomed proposals for the introduction of a single set of regulations. However, implementation of a single regulatory framework for human and animal pathogens was recognised from the outset to be complex and challenging, legally and technically. The new framework will be based on a Legislative Reform Order (LRO) which provides HSE with the vires to make regulations in relation to animal pathogens, and a common set of containment measures based on advice from the Advisory Committee on Dangerous Pathogens (a group of independent scientific experts).

The aspirational timetable of end 2008 proposed by Sir Bill Callaghan in his review was accepted as not feasible. Whilst there may be some issues in not delivering to the original timescale, these are heavily outweighed by the risk of delivering a regime that is not fully fit-for-purpose and which does not command support of stakeholders. HSE and Defra remain



fully committed to delivering a single regime and it is now expected to be delivered and implemented by October 2010.

This project therefore recommends that the following actions occur:

- The Defra project reviewing the authorisation system for imports of animal products and pathogens which are intended for research or diagnostic purposes, should consider:
  - Involving the ACIES Customs Committee as part of their stakeholder consultation exercise
  - Conducting an awareness campaign to inform potential importers about post office regulations and licensing requirements
  - Including conditions on the licence applications that importers must abide by transportation and packaging requirements
  - Research organisations have a nominated individual to promote awareness and compliance with import rules and regulations
- Defra to consider with UKBA as part of the whole remit of the revised Service Level Agreement the possibility of carrying out a targeting exercise at a postal/parcel depot to provide better evidence on the number of illegal imports of products of animal origin, including those intended for research or diagnostic purposes.
- Defra works with HSE to ensure that transportation is one of the issues considered in their future benchmarking exercise.

### **8.1.2 Recommendation 2 – Livestock Transport Vehicle Movements**

#### *R2a Review the veterinary risk assessment for the Cleansing & Disinfection of vehicles – both internal movements and vehicles from abroad*

Defra policy leads and veterinary experts confirm that livestock transport vehicle movements present a disease risk that needs to be reduced through cleansing and disinfection (C&D). Livestock transport vehicle movements are a means of spreading disease either by infecting the animals being transported or mechanically transferring contaminated external dirt to other premises. Therefore, C&D is seen as a crucial part of disease prevention and this should remain the message to our delivery partners and customers.

Currently there are few exports or imports of livestock from abroad and these are restricted to a limited number of ports. Ferry companies carry out C&D checks on vehicles before transporting them to or from GB, and inform port officials and/or Animal Health officers of any livestock vehicles onboard, whether carrying animals or empty. Road hauliers do not think that the same level of checks take place for vehicles using the channel tunnel. However, the likelihood of a dirty vehicle entering GB from another EU Member State is seen as low. France, Holland and Germany issue heavy fines if vehicles are stopped for being dirty. This is enforced by the police and is regarded by UK hauliers as an effective deterrent.

Another form of vehicle movements which had been identified as a potential risk in our discussions was the return of military equipment from international operations and training manoeuvres. Whilst not used for carrying livestock, military vehicles do operate in international territory where diseases exotic to the UK are endemic. During an outbreak in

the UK this risk can also reverse, an example being the concern expressed in 2001 when the British military wanted to take equipment to a training base in Germany.

To address this risk the Ministry of Defence (MoD) have a biosecurity policy in place. Under this policy all equipment is subject to washdown at exit point prior to being loaded on to the carrier vessel to avoid cross contamination. The washdown process itself is supervised and monitored by ground staff. Washdown and quarantine facilities are also available at disembarkation points for use where in-field C&D was unable to take place or where the appropriate levels of cleanliness have not been met. In addition in-field risk assessments are carried out by military veterinary officers when an animal disease is suspected. This assessment is then used to develop contingency plans, where needed.

Whilst MoD are content that the risk posed by returning military equipment is being effectively managed, there are concerns that it is not always proportionate and that there may be an argument for tailoring the procedures to reflect the threats posed by particular diseases. The current policy is under review and is in the process of being updated. As part of this review Defra and MoD are discussing a 'baseline' procedure for all equipment which could be ramped up to reflect a particular disease threat at the location. A more evidence based approach to C&D would help staff to understand the risk and make the task seem less onerous.

The risk posed by the movement of vehicles from abroad is seen as well managed and enforced. Movements within GB, however, are seen as a greater risk. In addition vehicles associated with certain behaviours (i.e. large commercial haulage trucks or farm tractors and trailers) and different types of journeys (i.e. single or multi-point journeys) pose varying levels of risk which could usefully influence enforcement priorities at a local level.

*R2b Assess if controls need to be more rigorously enforced or strengthened in discussion with Animal Health, Local Authorities and the livestock and road haulage industries*

The Transport of Animals (Cleansing & Disinfection) Order 2003 requires all vehicles used to transport livestock to be cleansed and disinfected 'as soon as reasonably practicable' and within 24 hours of the journey being completed. In addition any driver leaving an abattoir or an animal gathering (market or show), in a vehicle used to transport livestock, must either C&D the vehicle before leaving or give a written declaration to the licensee of the premises specifying where the C&D will subsequently take place. This declaration must be sent to the LA on the same day to enable LA officers, where appropriate, to check that the vehicle has been cleansed and disinfected as specified by the driver.

General feedback from discussions with LAs, road hauliers and AH is that the majority of livestock vehicles are clean, in particular the large commercial vehicles were singled out as being consistently compliant with the C&D requirements. However, both LAs and road hauliers identified a number of issues to the effective enforcement and compliance with the C&D controls.

The first concern was the availability of 'adequate' washout facilities at markets, shows and abattoirs. Whilst the majority of abattoirs and animal gatherings have washout facilities, as a licence requirement, these are not always adequate in terms of water pressure, disinfectant provision or for the number and size of vehicles using the premises. This concern has been recognised and Defra is developing a tool which will enable Meat Hygiene Service officers to assess the adequacy of the C&D facilities at abattoirs based on the throughput of vehicles in relation to the hours of operation, and the number of declarations issued. The proposal is for this information to be shared with LAs to enable officers to take a risk based approach to enforcement. LAs will be better able to target enforcement effort at the users of premises where appropriate C&D is unlikely to take place due to inadequate facilities, and at drivers

who always use the declaration system. The tool can be adapted to apply to livestock markets and shows, and Defra is to discuss with LAs the potential value of this information in taking forward their risk based approach to enforcement.

In subsequent discussions LAs also expanded on concerns raised at the workshop (November 2008) that it was difficult to take prosecutions under the declaration system. The main frustration being that LA officers felt unable to follow up on a significant number of declarations. Where they did follow up declarations, LA officers believed that they were unable to accurately assess whether the requirements of the Order had been met as often it was claimed that the vehicles had been reused.

Whilst recognising that the declaration system may have its limitations, requiring all vehicles to C&D before leaving a premises is impractical. A large number of premises do not have space to install washout facilities to adequately cope with the throughput of vehicles. A blanket requirement would result in lengthy delays in vehicles waiting to C&D and leave the premises. This in turn would have a disproportionate cost on a number of operations (markets, abattoirs and haulage companies) with a significant number being forced out of business.

By using other enforcement powers within the Order, such as the powers to serve a notice, combined with better intelligence on the high risk operations and vehicles, LAs should be able to better target enforcement and manage the disease risk. It was agreed that Defra should work with LACORS, local authorities, Animal Health and the Meat Hygiene Service to drive forward the development of guidance for LAs to raise awareness of the objectives of the C&D controls, their powers and to help guide them in targeting activity at the highest risk.

### **8.1.3 Recommendation 3 – Livestock Movements Around GB**

#### *R3a Review the model for 6-day standstill and impact of SOAs and other exemptions*

The CPH Programme, being led by the Animal Health agency is seeking to resolve the issues relating to livestock location information held by government. This includes:

- Creating a maintained picture of GB livestock location which will be constantly available across the Defra network.
- Addressing the risks associated with CTS links and SOAs.
- Refreshing and enforcing new business rules across organisations which issue location identifiers.
- Defining and agreeing individual keeper's land and building groupings so that livestock movement reporting between these groupings is transparent and can be enforced.
- Removing anomalies (e.g. temporary CPH numbers) from the current and future CPH dataset to improve data quality.
- Redefining business processes to ensure sustainability of the CPH identifier as a meaningful identifier of animal location.

The programme is currently investigating the level of risk associated with CTS linked holdings and SOAs and considering what actions might be taken to address concerns ahead of the introduction of Extended Use Isolation Units.

As part of this work, Defra has evaluated previous modelling studies (Kao *et al.* 2006, Green *et al.*, 2006) which have shown that rapid spread of disease within SOAs does increase the geographic and temporal spread of a potential FMD epidemic in GB. In these studies, the increase was small and was not perceived to represent a qualitative change in the potential for a national epidemic. However, the work did not consider potential differences between SOAs and other premises that might impact on the role that SOAs might play, and was conducted on the livestock movement data for 2003. Since this time the number of premises registered as part of a SOA has increased significantly, with the new requirement for pre-movement TB testing being a significant driver.

Defra has now commissioned further modelling, using the latest available data and building upon the previous work undertaken. This work will:

- Identify whether or not the number or characteristics of SOAs have changed since 2003.
- Identify the characteristics of SOA's that may be related to FMD spread and determine whether or not they are different from other premises.
- Explicitly model the impact of these differences on the potential for a putative FMD epidemic to spread in GB.

The initial outputs from this modelling work will be available in autumn 2009 and this project recommends that the CPH Programme in conjunction with the Exotic Disease Policy Programme, use these outputs to characterise the risk presented by SOAs and inform their analysis of the actions which need to be taken to mitigate this risk.

*R3b Assess whether existing controls remain effective and seek possible solutions with Animal Health, Livestock Auctioneers and Local Authorities – e.g. review of current SOAs, review of biosecurity at markets*

The review of current SOAs will be taken forward by the CPH Programme and the Exotic Disease Policy Programme once the outputs from the modelling work are available.

A review of biosecurity at markets is being undertaken as part of a review of the biosecurity regime under the Animal Gatherings (England) Order 2006. The current requirements for biosecurity and licence conditions within Order 2006 are not all being met, posing a risk that key biosecurity hazards are not being adequately covered. The revision process allows the following:

- Stakeholders to raise issues regarding the current biosecurity regime and how we could improve on it;
- Stakeholders to see that Defra is not complacent regarding exotic diseases and the effects caused;
- Ensure the prevention processes within the Order are working and assess their effectiveness;
- Continue our strong stakeholder relationships.

The regime has been in place for a number of years and as part of the policy cycle it should be reviewed. The target is to introduce a revised biosecurity regime by the beginning of the 2010 show season. This work adheres to Defra's new strategy and sits directly under the priority to *ensure a thriving farming sector and a sustainable, healthy and secure food supply.*

A workshop was held in June 2009 with representatives of all who use, operate and undertake enforcement of the regime at livestock shows and markets. As a result, further meetings are being held to produce a revised Order, a new licence and a supporting industry guide to best biosecurity practice. Drafts are planned to be finalised and a wider consultation started during August 2009.

### *R3c Investigate level of movement recording across Local Authorities*

Preliminary investigations by both Defra and the British Cattle Movement Service (BCMS) did not uncover any inconsistency in reporting at different times of the year or in the overall number of movement reports entered onto the Animal Movements and Licensing System (AMLS) by over 100 Local Authorities between 2005 and 2008. This project has therefore not been able to gather any evidence to support these anecdotal concerns.

However, in the spirit of responsibility and cost sharing, Defra is currently considering proposals for sector specific, industry-owned databases, which will enable keepers to submit movement records electronically, have better access to their own data and gradually reduce the dependency on manual data entry. Animal Health, in conjunction with the pig industry, are currently piloting a system which is providing electronic reports of food chain information to slaughterhouses in England and Wales via an electronic 'hub' of pig data managed by BPEX. If the technology is deemed successful, the intention will be to extend this pilot to also assess the feasibility of providing electronic movement information on pigs, from this BPEX 'hub' directly into AMLS.

For the purposes of this project no further action is recommended and this recommendation is closed.

### *R3d Investigate the level of cattle and sheep identification compliance*

Cattle and sheep id is an EU requirement. The UK produce annual reports to the Commission on the level of cattle and sheep id compliance. Both the UK Government and the Commission have not expressed any concern about the current level of compliance. However, it is acknowledged that there is always room for improvement and the British Cattle Movement Service (BCMS), Defra and LAs work continuously with industry to achieve this improvement.

Concerns expressed relating to sheep being identified by batch for movement purposes, rather than as individual sheep, are not shared by policy leads in Defra and the current reporting regime is in line with the EU requirements. Defra has carried out an independent epidemiological study which suggests that a batch system coupled with domestic disease control order provisions provides the disease control assurances that are needed. The cost of introducing individual recording for all sheep is seen as disproportionate to the disease control benefits that it would gain.

Individual movement recording in farm registers for breeding flock however, will be introduced at the end of 2009 to meet EU requirements. Individual recording on movement documents will be phased in from 1 January 2011.

For the purposes of this project no further action is recommended and this recommendation is closed.



*R3e Commission studies to further understand certain livestock sectors, e.g. pig, goat and camelid industries*

Several programmes within Defra have a requirement to develop a better understanding of certain livestock sectors, including the Exotic Disease Policy Programme, the Livestock Hub and the TB Programme. Discussions have taken place with these programmes and the specifications for three livestock sector reports on pigs, camelids and goats have been prepared. These reports are in the process of being commissioned from ADAS and are expected to deliver by March 2010.

#### **8.1.4 Recommendation 4 – Contact Between Livestock and Wildlife**

*R4a Commission veterinary risk assessments to review the risk posed by wildlife*

The inter-relationships between livestock and wildlife create the potential for transmission of pathogens in either direction, from wild animals to domestic animals or vice-versa. This can involve three kinds of disease, endemic diseases, exotic diseases or emerging or re-emerging diseases (BENGIS et al, 2002).

In recognition of our need to increase our knowledge and better understand wildlife disease generally Defra launched the England Wildlife Health Strategy on 15 June 2009. The strategy provides a framework for a coordinated, appropriate and proportionate response to wildlife disease issues.

Prioritisation is essential in an area as diverse as wildlife disease. A strategic aim of the strategy is to have: Wildlife disease risk assessments, impact assessments and cost/benefit analyses in place to support wildlife health prioritisation, decision making and policy development within available resource.

The strategy also sets out the tools for wildlife disease surveillance, data collection, information management and threat assessment. This includes the use of modelling to define high-risk areas for priority surveillance and monitoring, i.e. risk maps showing areas of the UK where poultry are at highest risk from incursion by wild birds have been published (SNOW et al 2007). Ultimately this will enable us to make informed decisions about areas which may be high, medium or low priority for surveillance and monitoring.

Specific wildlife disease contingency plans are being developed for key disease scenarios on an on-going basis.

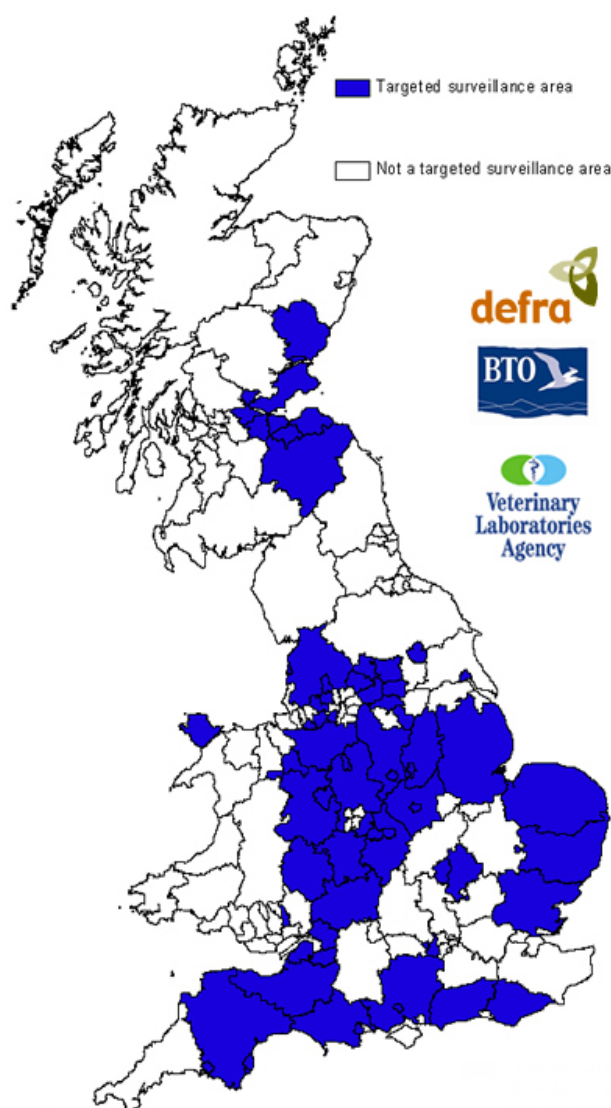


Figure 25: Avian influenza: wild bird surveillance priority counties, taken from Defra website



To better understand the risks posed two wildlife species have been identified as priorities for gathering evidence and surveillance to enable the risks they pose to be assessed in terms of transmitting and spreading diseases of livestock.

The first is gathering fit for purpose population data and surveillance for feral boar. This fits in with the classical swine fever project which has been identified as a priority area in the Exotic Disease Policy Programme and will inform disease control strategies. The information will be used to update risk maps, similar to the one above (figure 26) for avian influenza, enabling surveillance to be targeted and ensuring pig keepers in the high risk areas take appropriate measures to protect their animals from contact with feral boar.

The second is gathering evidence and population data on deer to assess the risks they pose to livestock and to support veterinary risk assessments and contingency planning. Currently the ability of deer to carry and maintain livestock diseases is a gap in our understanding of the risks posed by wildlife.

#### *R4b Discuss with livestock industry possible measures and solutions to improve on-farm biosecurity*

Natural England Wildlife Management and Licensing Team provide advice to both Government and stakeholders on the management of wildlife in relation to the spread of disease, in particular during disease outbreaks. Defra is currently funding a range of biosecurity related research projects in order to further develop our evidence base, including looking at management options for controlling feral boar and reducing the contact rate with livestock.

However, the effectiveness of messages on biosecurity can always be improved and this recommendation will be taken forward under a broader one encompassing on-farm biosecurity compliance and understanding (recommendation R12). Here Defra will have to work closely with industry in developing and communicating messages on farm resilience and the risks posed by certain farming practices and methods.

## 9 Final Recommendations

There are three different sets of recommendations. The first are aimed at addressing the findings from the work undertaken by the project on the priority pathways. The second are other challenges identified that do not fall under these priority pathways but remain significant issues for others to take forward. Finally, the third are further actions to validate and build upon this project and its findings.

### 9.1 Recommendations: Taking Forward the Priority Pathways

Following the review of the priority pathways in phase 2 of the project there are a number of recommendations to continue to take this work forward where appropriate and further improve our evidence base.

Table 26: Final recommendations to enhance the resilience of the 4 priority pathways

Pathway	Recommendation	Owner
Imports of laboratory materials	<p><b>R1</b> The Defra project reviewing the authorisation system for imports of animal products and pathogens which are intended for research or diagnostic purposes, should consider:</p> <ul style="list-style-type: none"> <li>– Involving the ACIES Customs Committee as part of their stakeholder consultation exercise</li> <li>– Raise awareness amongst potential importers about post office regulations and licensing requirements</li> <li>– Including conditions on the licence applications that importers must abide by transportation and packaging requirements</li> <li>– Research organisations have a nominated individual to promote awareness and compliance with import rules and regulations</li> </ul>	Veterinary Science Team
	<p><b>R2</b> Defra to consider with UKBA as part of the whole remit of the revised Service Level Agreement the possibility of carrying out a targeting exercise at a postal/parcel depot to provide better evidence on the number of illegal imports of products of animal origin, including those intended for research or diagnostic purposes</p>	Veterinary Science Team
	<p><b>R3</b> Defra works with HSE to ensure that transportation is one of the issues considered in HSE’s future benchmarking exercise for laboratory inspections</p>	Exotic Disease Policy Programme
Livestock transport vehicles	<p><b>R4</b> Defra works with LACORS to:</p> <ul style="list-style-type: none"> <li>– identify intelligence to assist local authorities in targeting risk; and</li> <li>– drive the development of a guidance note for local authorities in</li> </ul>	Veterinary Science Team / Exotic Disease Policy Programme

	collaboration with Animal Health and the Meat Hygiene Service, highlighting the objectives of the C&D controls and the powers enforcement officers have under the existing Order	
Livestock Movements around GB	<b>R5</b> The CPH Programme in conjunction with the Exotic Disease Policy Programme, use the outputs from the exotic disease modelling work to characterise the risk presented by SOAs and inform their analysis of the actions which need to be taken to mitigate this risk	Exotic Disease Policy Programme
	<b>R6</b> The Defra project to review the Animal Gatherings Order 2006 delivers a wider review of biosecurity at gatherings and introduces a new regime in time for the 2010 show season	Exotic Disease Policy Programme
	<b>R7</b> Commission studies to further understand certain livestock sectors e.g. pig, goat and camelid industries	Veterinary Science Team
Contact between livestock & wildlife	<b>R8</b> Service Level Agreements are developed with wildlife delivery agencies that are currently are relied upon for wildlife field visits and advice	Veterinary Science Team
	<b>R9</b> Gather population data and surveillance information to improve our evidence of feral boar distribution, to better target surveillance and to inform contingency planning	Veterinary Science Team
	<b>R10</b> Evidence and population data on deer to assess the risks they pose as carriers and potential cause of the spread of livestock disease, to support a veterinary risk assessment and contingency planning	Veterinary Science Team

## 9.2 Recommendations: Other Challenges

In addition to these key pathways, there are a number of issues raised under other pathways or cutting across pathways that deserve some further consideration. The project has also recommended owners in Defra for these actions.

Although the overall resilience rating for the horse imports and movements pathway is medium, a major vulnerability is a lack of detailed understanding about the structure of the horse-keeping community and population density and distribution of equines. There is also little understanding about the movement of horses outside the race horse sector, and how populations interact. Given the increasing political interest in impacts of certain horse diseases, Defra's Exotic Disease Policy Programme is allocating more resource into a policy team to develop control strategies for the key exotic horse diseases. We recommend that:

Recommendation	Owner
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<b>R11</b> Studies are commissioned to gather fit for purpose equine population data and conduct necessary network analysis to underpin the development of disease control strategies.	Exotic Disease Policy Programme
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There are a number of issues identified in the project which do not align to a specific pathway but cut across the whole of the exotic disease control and mitigation framework, for which Defra will need to work closely with delivery partners and/or industry to address.

General on-farm biosecurity was a running theme in our discussions. The lack of monitoring or enforcement of biosecurity measures means that we have little knowledge of the general level of observance on premises. One particular issue identified is the potential risks that temporary or casual farm workers and farm visitors may pose. Another was concern of the level of appreciation of the risks associated with certain livestock farming practices and whether appropriate biosecurity measures were being put in place to mitigate this increased risk. An example given was the use of “flying herds” by dairy farmers, this is where all replacements are brought into the herd at regular intervals and kept for a few years before being culled or sold on. The risk of introducing disease to a dairy farm is seen as being much higher with a flying herd compared to a closed dairy herd, where the farm rears its own replacements. This recommendation also picks up the issue of on-farm biosecurity to reduce the contact between wildlife and livestock. Therefore, we recommend:

<b>Recommendation</b>	<b>Owner</b>
<b>R12</b> Further investigation of the risks posed by certain farming practices, such as the use of temporary/ casual workforce, or “flying herds”. In particular the level of understanding amongst farmers of the associated risks of these practices and the steps that they are taking to strengthen their resilience and raise awareness of biosecurity guidance with their workers. As well as the general level of compliance and understanding of on-farm biosecurity, particular for farms where the threat of contact between susceptible wildlife and livestock is high.	Exotic Disease Policy Programme

Alongside biosecurity advice and training, the farmed animal workforce need to be able to spot and report clinical signs of disease. Early detection is a critical factor in preventing an exotic disease occurrence becoming an outbreak. Again we have little information about the effectiveness of advice given and the level of awareness and willingness to report suspicion of disease amongst farmers and private veterinarians. A high level review of the information available and sources of communication was carried out in June 2009 by veterinary intern students on placement in Defra. The review highlighted a number of recommendations in particular to update and revamp the Defra website, as well as look at the other means of communication available and their potential effectiveness. To take this work forward we recommend:

<b>Recommendation</b>	<b>Owner</b>
<b>R13</b> A project to update and co-ordinate the advice and guidance currently being given on the Defra website on detecting exotic animal diseases and the process for reporting suspicions. This will require close collaboration with Animal Health and other delivery partners, such as the British Veterinary Association and industry, to ensure consistency of information and appropriate signposting. The project should also consider the potential of other communication tools to support the website refresh.	Exotic Disease Policy Programme / Veterinary Science Team

One of the main themes that came out of our workshop with delivery partners was the complexity of existing legislation. A clear, enforceable and proportionate legislative framework is central to the successful delivery and enforcement of exotic disease controls. Therefore, we welcome the proposal set out in Animal Health's draft Enforcement Strategy *'to work with policy customers and enforcement partners to review the functioning of the regulatory framework to see the ways in which it can be improved'*. It will also be important to ensure that legislation and supporting guidance is effectively communicated, ensuring that all parties involved understand their roles and responsibilities. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R14</b> The Exotic Disease Policy Programme supports Animal Health in its review, feeding in expertise and concerns, monitoring progress and taking forward solutions. In particular that concerns on the complexity of feed controls are investigated and clarified. That the programme separately considers with Defra Legal what guidance is needed to ensure that amendments to existing regulations and the drafting of new regulations incorporates these solutions.	Exotic Disease Policy Programme

Alongside a sound legislative framework, effective enforcement relies upon good communication between delivery partners and a joined-up approach by all involved. Animal Health have a key role in facilitating communications amongst the exotic disease control and mitigation delivery network. Once again we welcome the aims set out in Animal Health's Enforcement Strategy on 'Partnership working and engagement'. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R15</b> Defra's Food & Farming Group Agency Relationship Team continue to work with delivery partners to drive collaborative working, the sharing of information at an operational level and influence outcomes.	Food & Farming Group Agency Relationship Team

### 9.3 Recommendations: Further Actions

This project provides a high level review of the resilience of our risk pathways. Given the short-term nature of the project there are a number of activities which could be taken forward separately to strengthen and build upon the findings of the report, and aid any review of risk in the future.

We have identified generic issues which affect the evidence base on which the conclusions of this project are based. We have had to make some assumptions about levels of compliance with existing requirements, based on anecdotal feedback from delivery partners. In many areas there is no formal mechanism for capturing data on compliance and enforcement to help assess the effectiveness of our policies and rules in practice. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R16</b> Defra works with its range of delivery partners to improve the level of intelligence capture and feed back to the Department, so there is a more formal evidence base with which to develop or enhance policies, and to help delivery partners prioritise	Food & Farming Group Agency

<b>enforcement activities on the basis of risk. This is consistent with the ‘making the best use of data’ aim set out in Animal Health’s draft Enforcement Strategy.</b>	Relationship Team
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This project has assumed that the listed exotic diseases, which were brought into the scope of the review on the basis of expert opinion, are of equal importance. Clearly, some diseases pose a higher risk than others, and each has a different type or magnitude of impact. Thus, the importance of some risk pathways will depend on the number of diseases which can exploit them and the impact those diseases can have. During stage 1, this project would have benefited from an objective risk ranking offered by the Disease Prioritisation Tool. This tool is an effective mechanism by which the risk and impact of different diseases are scored on the basis of the four reasons for Government Intervention set out in the Animal Health and Welfare Strategy. Since the RPV project began, twenty one disease profiles have been fully validated and published and a further 57 profiles are currently in drafting, including all of the major exotic and endemic diseases. We recommend that:

<b>Recommendation</b>	<b>Owner</b>
<b>R17</b> Completion of disease profiles continues to be a priority for Defra, and the remaining profiles on exotic diseases are completed and validated as soon as practicable to enable an accurate and objective disease risk ranking to be carried out. This will enable a validation of the expert opinion that has helped identify the diseases in scope. A more accurate disease ranking will enable us to identify with more accuracy, the risk pathways of most concern.	Veterinary Science Team

In the course of this project we have identified a large number of risk pathways. It has been necessary to focus most of our available resource on the high probability pathways, which have been identified with experts and prioritised in Workshop 1. It is also recognised that expert opinion gathered in workshops, whilst extremely valuable, does not necessarily produce objective evidence. To validate this study and build on the findings we recommend that:

Table 27: Recommendations to validate and build upon the findings of the report, including the establishing a foundation for future reviews

<b>Recommendation</b>	<b>Owner</b>
<b>R18</b> The Exotic Disease Policy Programme prioritises resources on management of high probability pathways identified by our experts in the short term, and monitors and reports progress against the recommendations in this report.	Exotic Disease Policy Programme
<b>R19</b> That this report provides a foundation for the regular review of the risk pathways at appropriate intervals, taking into account disease profile updates.	Veterinary Science Team
<b>R20</b> That a small project is commissioned to review the case history of outbreaks in Europe over the last 5 years and compare this to our ranking of high likelihood risk pathways produced by expert opinion.	Veterinary Science Team
<b>R21</b> That a small project to scope a possible analysis of risks from low/medium probability risk pathways is commissioned to identify and assess potential high impact scenarios (if a sequence of low probability events occur), taking into account current levels of risk management. For example, the risk posed by international catering and galley waste both from	Exotic Disease Policy Programme



**aircraft and ships.**

## **10 Implementation & Future Reviews**

With the closure of this project there is a risk that the actions set out in the recommendations at chapter 9 could lose momentum. To avoid this happening the risk pathways & vulnerabilities project team will work with the relevant policy leads to develop and an implementation plan.

### **10.1 Implementation Plan**

The implementation plan will set out the timescales and milestones for the achievement of the recommendations in this report. It will enable the monitoring and reporting of progress to the Exotic Disease Policy Programme Board as part of the ongoing business of the programme.

It is also proposed that a risk pathways and vulnerabilities summit is held in Spring 2010 to review and evaluate progress and maintain focus on risk based prioritisation.

An evaluation of the delivery and success of this project recommendations will form a starting point of subsequent reviews.

### **10.2 Future Reviews**

This section looks at the role of future reviews: the methodology and their timing. In particular what should trigger a future review of exotic disease risk pathways.

We know that disease pathways do not remain static and may change with time. Conducting regular reviews to ensure we continue to understand the risks and vulnerabilities, therefore, is good practice in risk management. It also enables prioritisation across a wide spectrum of risk, in an area where demand can be high and resources limited. Being able to assess our resilience, therefore, is essential.

#### ***10.2.1 Taking into account lessons learned***

The risk pathways and vulnerabilities project is the first formal high level review of the risk of an outbreak across the different pathways and exotic diseases. A full lessons learned report will be written and presented to the Exotic Disease Policy Programme Board as part of the process for closing the project. Any future review will want to take account of these learning points.

#### ***10.2.2 Evaluating the impact of the recommendations***

As well as the lessons learned report an evaluation of the success of the recommendations from this report in strengthening the resilience of the pathways will need to be considered. Future reviews will want to consider whether the recommendations of previous reports were delivered. And whether the recommendations led to the benefits envisaged or if the risk or threat to resilience remains significant. The monitoring and reporting against the implementation plan will provide a good starting point.

#### ***10.2.3 Methodology for future reviews***

As with this review future reviews will be needed to identify any new, or existing disease

pathways which are becoming more significant and to assess the level of risk management being applied. This enables policy and veterinary leads to validate their current understanding of the risk and prioritise resource accordingly.

### **1. Identifying the high risk pathways**

Whilst this project sought to rehearse pathways with experts future reviews will be able to build upon this initial assessment and ask experts to flag any new or other pathways which they think are becoming increasingly significant. The outputs from the recommended review of past European outbreak causes (recommendation R20) and the study of the low/medium/unknown pathways (recommendation R21) should also inform the scope of future reviews. As should the outputs of the engagement seminars for this report. Future reviews will want to take into account the issues raised and any concerns with the approach raised by stakeholders in the planned seminar sessions. These issues and concerns will be captured and published on the Defra website.

### **2. Reviewing existing controls**

This report will provide the initial information which future reviews will look to update following the introduction of new legislation and, or controls.

### **3. Reviewing enforcement and compliance**

This should be an essential part of any future review and will require discussions with delivery partners to ensure a good understanding of what is happening in the field. Involvement and buy-in from stakeholders – both internal and external – is vital. Future reviews will particularly want to consider how and when to engage delivery partners and wider stakeholders, such as core group members, taking into account sensitivities and potential presentational issues.

### **4. Assessing our resilience**

In order to assess and compare the resilience of the pathways under review key questions and criteria need to be formulated. The factors considered by this project are:

- Likelihood and impact of exotic diseases exploiting the pathway
- Evidence and our confidence in the information at hand
- Controls and the effectiveness of existing countermeasures
- Reasons for intervention, such as the immediacy of the challenge and the level of responsibility Defra has for the pathway
- Wider consideration, such as pressure from stakeholders, the threat to existing priorities and how the risk might increase in the future

It is recommended that these criteria be used in further reviews to provide a level of consistency in the assessment of risks but it is recognised that they may need to be adapted or expanded to take account of any changes in emphasis or to reflect current issues.

#### **10.2.4 Initiating future reviews**

There are potentially three drivers for initiating future reviews:

- **Time** – reviews could be carried out on a regular basis, i.e. annually, bi-annually
- **Triggers** – specific triggers could be identified which would signal the need for a review, i.e. major changes in policy direction, lessons learned from an outbreak, risk escalation
- **Indicators** – leading indicators could be identified and monitored, triggering a review

when a certain level is reached. Indicators, for example, could cover changes in industry practices

It is recommended that future reviews of the risk pathways are carried out on a **trigger** basis. The triggers considered are:

- **Major changes in policy direction, delivery or enforcement** – it is recommended that the closure of the Exotic Disease Policy Programme in April 2011 should trigger a review of the risk pathways. Given the date of the programme closure, it is likely that this will be the next review. Another major change will be the proposed move of responsibilities for animal health policy delivery to a Responsibility and Cost Sharing body. Changes within the wider Defra family will also need to be taken into account, such as changes in enforcement priorities for Animal Health.
- **Lessons learned from a disease outbreak** – the Veterinary Risk Group will wish to consider whether a review of the risk pathways may be appropriate following the lessons learned from a disease outbreak. For example if the outbreak was caused by a new or previously deemed ‘low likelihood’ pathway, the risk presented by the pathway will need to be reconsidered. This may not lead to a formal review of all pathways but a focused investigation of the pathway in question.
- **Risk escalation** - Figure 27 below sets out the process by which a review could be triggered during business as usual. Under this scenario the feedback and monitoring of the pathways identified in this report, could lead the Exotic Disease Policy Programme Board to escalate concerns to the Veterinary Risk Group in order for a formal review to be commissioned. Another trigger would be a risk identified in the Emerging Threats Highlight Report, which the Veterinary Risk Group may also consider significant enough to commission a review.

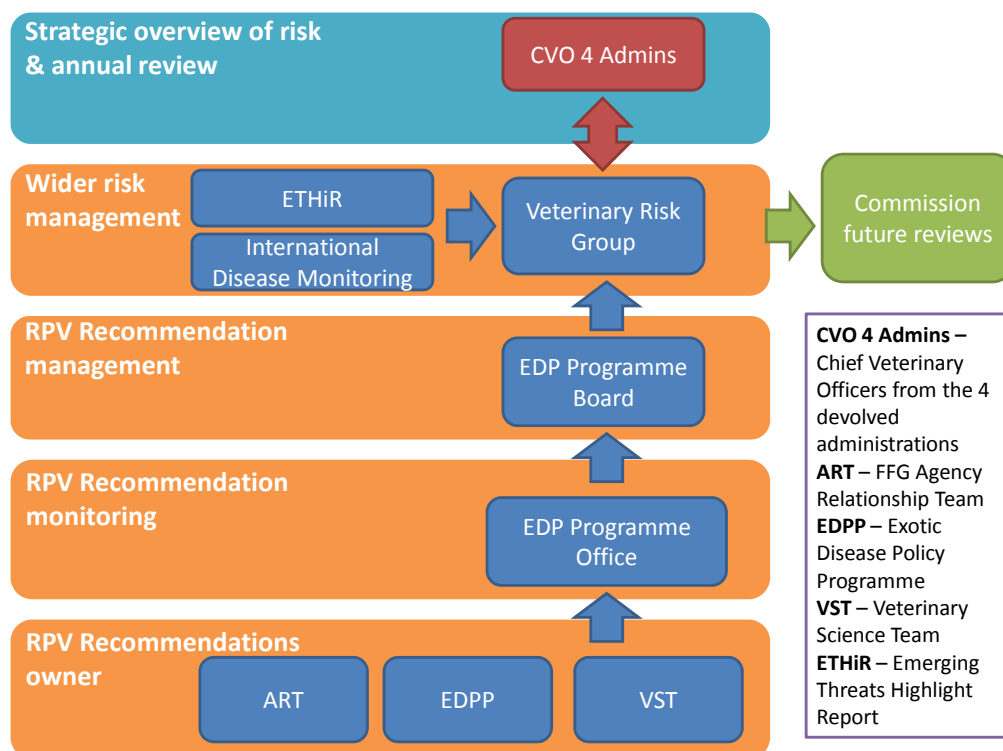


Figure 26: Commissioning future reviews of risk pathways

As well as a trigger basis for reviews it is recommended that a **light touch** review is carried

out on a regular basis. The aim being to mainstream continuous risk assessment and to provide reassurance that nothing is being missed by the triggers. It is proposed that the CVO 4 Admins group carry out an **annual review** of what they consider are the main risks. The CVO 4 Admins meeting is chaired by the Chief Veterinary Officers for the UK and attended by CVOs from Scotland, Wales and Northern Ireland, as well as Animal Health, the Food Standards Agency, Meat Hygiene Service and relevant policy leads or Directors.

The CVO 4 Admins group will be able to provide a strategic overview of the risks across the UK and review issues on the horizon. The Veterinary Risk Group will provide an update at the CVO 4 Admins meeting and highlight the risks under consideration, plus any mitigating actions underway. The CVO 4 Admins group may also wish to instruct the Veterinary Risk Group to look at other risks not previously considered that are areas of concern.

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## Annex 1 – Notifiable Exotic Diseases

List of diseases which are notifiable according to section 88 of the Animal Health Act 1981 or an Order made under that Act. Data correct as at June 2008.

Notifiable Disease	Species Affected	Occurred last in Great Britain
African Horse Sickness	Horses	Never
African Swine Fever	Pigs	Never
Anthrax	Cattle and other mammals	Present
Aujeszky's Disease	Pigs and other mammals	1989
Avian Influenza (Bird flu)	Poultry	Present
Bovine Spongiform Encephalopathy	Cattle	Present
Bluetongue	All ruminants and camelids	Present
Brucellosis ( <i>Brucella abortus</i> )	Cattle	2004
Brucellosis ( <i>Brucella melitensis</i> )	Sheep and Goats	1956
Classical Swine Fever	Pigs	2000
Contagious agalactia	Sheep and Goats	Never
Contagious Bovine Pleuro-pneumonia	Cattle	1898
Contagious Epididymitis ( <i>Brucella ovis</i> )	Sheep and Goats	Never
Contagious Equine Metritis	Horses	2008
Dourine	Horses	Never
Enzootic Bovine Leukosis	Cattle	1996
Epizootic Haemorrhagic Virus Disease	Deer	Never
Epizootic Lymphangitis	Horses	1906
Equine Viral Arteritis	Horses	2004
Equine Viral Encephalomyelitis	Horses	Never
Equine Infectious Anaemia	Horses	1976
Foot and Mouth Disease	Cattle, sheep, pigs and other cloven hoofed animals	2007
Glanders and Farcy	Horses	1928
Goat Pox	Goats	Never
Lumpy Skin Disease	Cattle	Never
Newcastle Disease	Poultry	2006
Paramyxovirus of pigeons	Pigeons	Present
Pest des Petits Ruminants	Sheep and Goats	Never
Rabies	Dogs and other mammals	2006
Rift Valley Fever	Cattle, Sheep and Goats	Never
Rinderpest (Cattle plague)	Cattle	1877
Scrapie (on Defra's BSE website)	Sheep and goats	Present
Sheep pox	Sheep	1866
Swine Vesicular Disease	Pigs	1982
Teschen Disease (Porcine enterovirus encephalomyelitis)	Pigs	Never
Tuberculosis (Bovine TB)	Cattle and deer	Present
Vesicular Stomatitis	Cattle, pigs and horses	Never
Warble fly	Cattle, (also deer and horses)	1990
West Nile Virus	Horses	Never

## Annex 2 – List of Internal Experts Consulted

### Participants at Experts Meetings:

- **Alick Simmons**, Deputy Chief Veterinary Officer & Director of Veterinary Science Team, Defra
- **Nick Coulson**, Deputy Director of Veterinary Science Team & Head of International Animal Health Section, Defra
- **Ruth Lysons**, Deputy Director of Veterinary Science Team & Head of Surveillance Zoonoses, Epidemiology and Risk Section, Defra
- **Richard Drummond**, Deputy Director of Veterinary Science Team & Head of Veterinary Exotic Diseases Section, Defra
- **John Bourne**, Deputy Director for Livestock and Livestock Products
- **Rob Paul**, Director of Veterinary and Technical Services, Animal Health
- **Jane Gibbens**, Head of Epidemiology Group, Defra
- **Simon Hall**, Head of Import Controls & Export Facilitation, Defra
- **Mirzet Sabirovic**, Head of International Disease Monitoring and Risk Assessment, Defra
- **David Mouat**, Head of Veterinary Exotic Notifiable Diseases Unit, Defra
- **Matt Hartley**, Head of Wildlife, Aquatic & Zoological Animal Health, Defra
- **Marion Wooldridge**, Head of VLA Centre for Epidemiology and Risk Assessment (CERA)
- **David Harris**, Contingency Planning Division, Animal Health
- **Andrew Beech**, Head of Animal Identification and Movements Policy, Defra
- **John Bell**, Head of Livestock Movement and Cattle ID Unit, Defra
- **Linda Reay**, Policy Advisor on Animal Pathogens & SAPO
- **Fletcher Morgan**, Epidemiology Group, Defra
- **Teresa Mills**, Lead Policy Advisor on Third Country Imports, Defra
- **Rolf Kluttig**, Imports Unit and Border Controls, Defra

### Attendees at Risk Pathways Workshop held on 21<sup>st</sup> October 2008, Nobel House, London

- **Bill Parish**, Portfolio Manager, Exotic Disease Prevention Programme, Defra
- **Matt Hartley**, Head of Wildlife, Aquatic & Zoological Animal Health, Defra
- **Simon Hall**, Head of Import Controls & Export Facilitation, Defra
- **David Mouat**, Head of Veterinary Exotic Notifiable Diseases Unit, Defra
- **Andrew Beech**, Head of Animal Identification and Movements Policy, Defra
- **Andy Paterson**, Veterinary Advisor
- **Balazs Toth**, Veterinary Advisor
- **Victor del Rio Vilas**, Epidemiologist and Veterinary Advisor
- **Julie Ross**, Veterinary Advisor
- **Rachelle Avigad**, Veterinary Advisor
- **Teresa Mills**, Lead Policy Advisor on Third Country Imports, Defra
- **Richard Hepple**, Veterinary Services Manager for Exotic Diseases, Animal Health
- **Helen Roberts**, International Disease Monitoring & Risk Analysis
- **Rolf Kluttig**, Imports Unit and Border Controls, Defra
- **Amie Adkin**, Senior Risk Analyst, VLA CERA
- **Paul Gale**, Risk Analyst Animal Diseases, VLA CERA

## Annex 3 – Mythical Disease Scenarios

### SCENARIO 1

**Risk Pathways:** Importation of contaminated animals and animal products into GB and exposure to susceptible livestock

#### Disease Profile:

<b>‘THE DREADED LURGI’</b>	<b>A highly contagious, rapidly spread, <u>mythical</u> viral disease of cattle, sheep and pigs.</b>
Human Health Implications	Public health risk is low. This is a zoonosis with very low numbers of authenticated cases around the world. No record of spread between people.
Main Species Affected	Cattle, sheep, pigs, goats, other farmed mammals and wild ruminants, all spp. of deer, antelope, camels, alpacas, llamas, elephants, giraffes, warthogs, bush pigs, hedgehogs, wild boar, rats, mice and guinea pigs. Foxes & birds are <u>not</u> susceptible.
Methods Of Transmission	Rapid spread - through direct contact (with infected animals or equipment), ingestion of contaminated meat or <u>water</u> , and aerosol transmission across short distances (<5 miles). There is no known treatment or vaccine.
Likelihood Of Detection In Live Animals	Difficult to detect in sheep, rats or mice. But highly likely to be detected in other species by vet, lab, farmer or abattoir.
Persistence In Environment	In environment can persist for up to 6 months under right conditions e.g. in slurry or meat. Preserved by refrigeration and freezing, inactivated at temps >50oC.
Worldwide Distribution	Endemic in some countries of central and eastern Europe, many regions of Africa, Middle East and Asia. Countries free of disease are: Australia, Canada, New Zealand, North America and Scandinavia.

### SCENARIO 2

**Risk Pathways:** Vector-borne disease of horses, poultry and migratory wild birds

#### Disease Profile:

<b>‘MOTABA FOWL FEVER’</b>	<b>A vector borne, <u>mythical</u> viral disease of birds and equines</b>
Human Health Implications	A zoonoses which can be transmitted to people via infected mosquitos or midges. Around 20% of people who are infected develop ‘flu-like’ symptoms and 1% with more serious disease with potentially fatal consequences.
Main Species Affected	Wild birds are the main carrier but rarely show signs of disease. Domestic poultry (inc. pheasants) tend to show severe disease & high mortality rate. Can also cause severe disease in horses, mules and donkeys.
Methods Of Transmission	Normal means of transmission is by the bite of an infected mosquito/midge, but can also occur via semen or embryos. Vectors become infected by feeding on infected birds or equines (inc. zebras). People are dead-end hosts. Under experimental conditions, virus has also been transmitted between birds in close contact with no vector present.
Likelihood Of Detection In Live Animals	Low in wild birds, but high in domestic poultry and horses. Mortality rate in poultry can be 100%, horses 50-90%, mules 50% and donkeys 10%. Zebras do not show disease but can act as reservoirs. Unlikely to be detected in vectors.
Persistence In Environment	UK has suitable and sufficient mosquito/midge vectors to spread disease, but it is unlikely that the virus will over winter. <u>Ticks can also become infected</u> but their role in transmission is unknown.
Worldwide Distribution	Never been isolated from birds or mammals in GB. However, recent geographical expansion means that the virus now occurs in migratory wild birds in Europe, Africa, the Middle East, West and Central Asia, Canada and USA. Recent outbreaks have occurred in horses and poultry in USA and Eastern Europe.

### SCENARIO 3

**Risk Pathways:** A fatal human infection, which could be brought into GB by the importation of pets/small carnivores, bioterrorist activity or accidental release from a laboratory and introduced into the urban and rural wildlife population

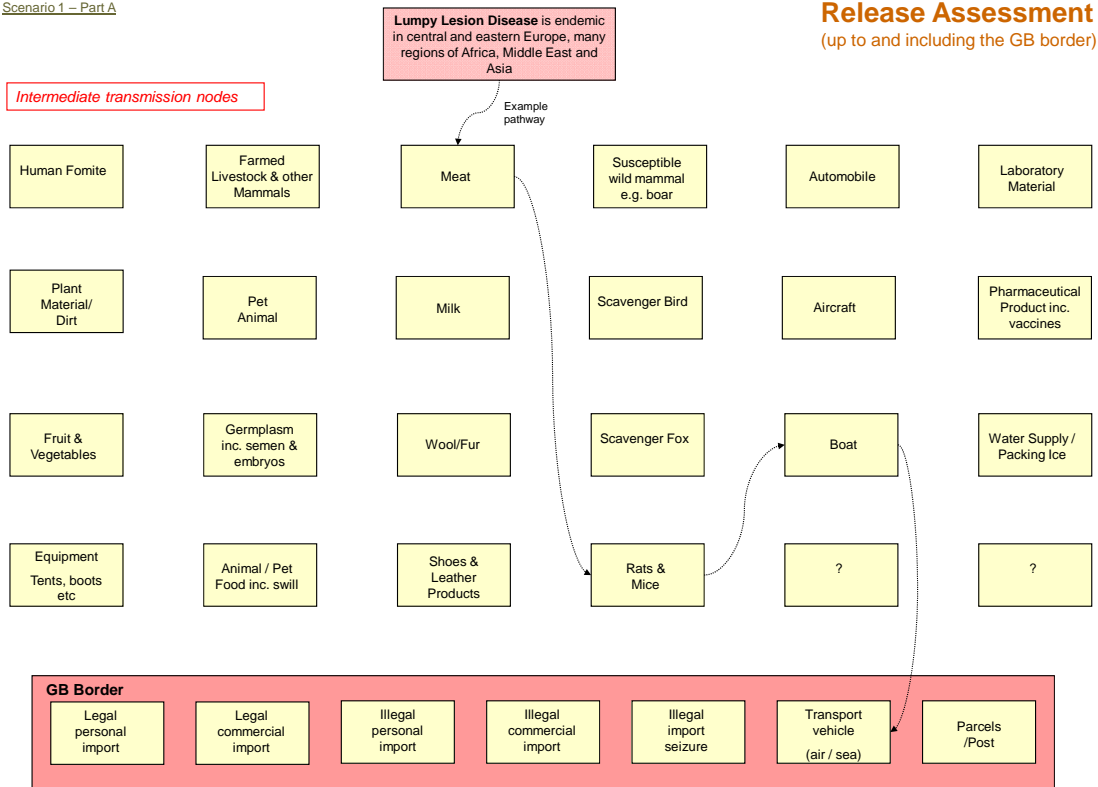
**Disease Profile:**

<b>'THE SCURGE'</b>	<b>A highly contagious , <u>mythical</u> bacterial disease of carnivores (including man) which has long incubation period</b>
Human Health Implications	A zoonotic, bacterial disease of carnivores, which is fatal in man once clinical symptoms have set in. Onset of clinical symptoms in infected animals and man has a variable incubation period of up to 6 months. There is an effective vaccine if used early enough.
Main Species Affected	Domestic pets (cats and dogs) but also small carnivores such as foxes, ferrets, weasles, stoats, badgers, mink and bats. Small ruminants, birds and equines are resistant.
Methods Of Transmission	Mainly through direct contact with saliva e.g. through the bite of an infected animal. However, under certain artificial conditions (which can be replicated with relative ease in a laboratory) the bacterium can produce spores which are able to persist in the environment and cause disease when inhaled or ingested by a susceptible animal. <b>For this reason the agent can be a target for terrorist activity.</b>
Likelihood Of Detection In Live Animals	Difficult to detect before onset of clinical signs, unless diagnosed by laboratory. Most vets, farmers and members of the public have never seen this disease.
Persistence In Environment	If spores are induced under artificial conditions, they can persist in the environment for significant lengths of time (> 1 yr). Over 200 research/laboratory institutions in GB have licences to store and manipulate this agent (at containment level 3). Diagnostic samples are also imported from abroad.
Worldwide Distribution	Disease is endemic in Africa, Asia, South America and sporadic cases occur in North America and Europe. Predominantly, disease is maintained in dogs in Asia and Africa, bats and raccoons in America, foxes and bats in Europe.

# Annex 4 – Risk Assessment Layouts

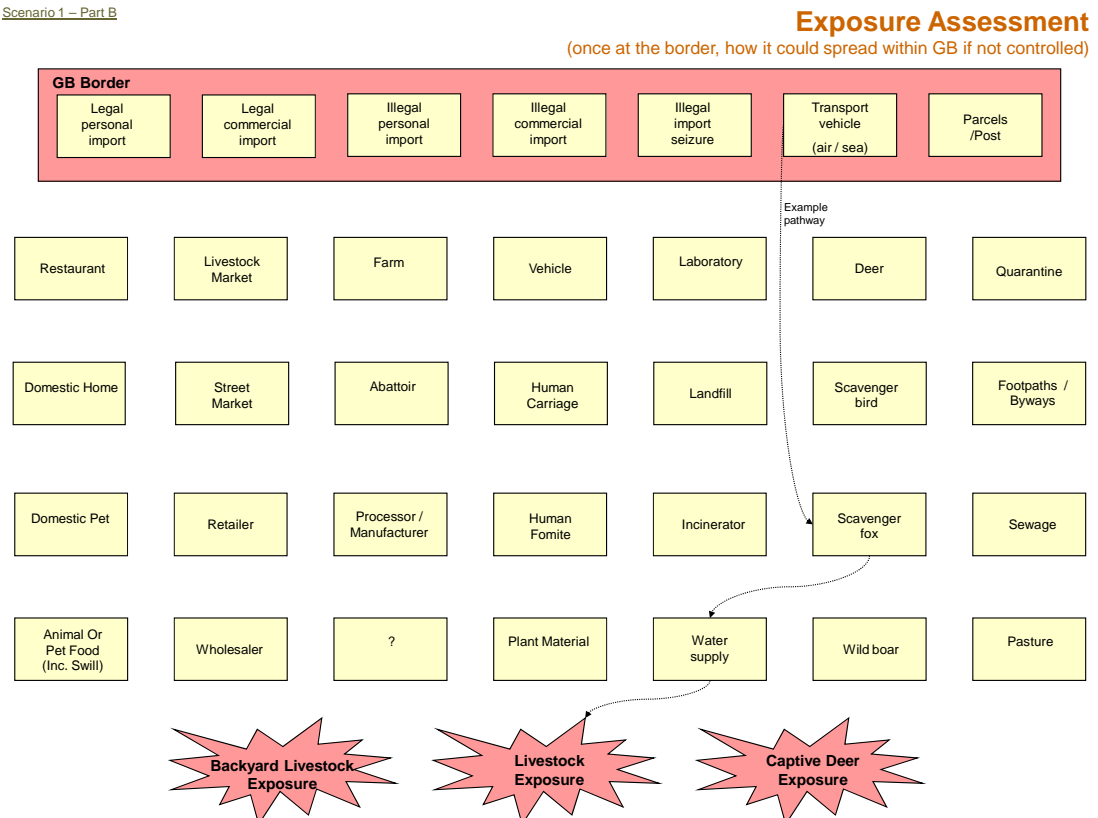
## Scenario 1: Release Assessment Layout

Scenario 1 – Part A



## Scenario 1: Exposure Assessment Layout

Scenario 1 – Part B





## Annex 5 – List of Attendees at Delivery Partners Workshop

Attendees at the Exotic Disease Risk Pathways & Vulnerabilities workshop held on Wednesday 26 November 2008, at the Innovation Centre Reading.

- **Kevin Chesson**, Trading Standards Surrey County Council (*LA with racecourse / animal gathering*)
- **Jeremy Adams**, Trading Standards Cambridgeshire County Council (*LA animal by-products expert*)
- **John Chaplin**, Trading Standards Suffolk County Council (*LA with high density of livestock keepers*)
- **John Pascoe**, Trading Standards Cornwall County Council (*Coastal LA concerned with smuggling*)
- **Eirian Williams**, Somerset County Council (*LA with livestock market*)
- **Neil Martin**, Dorset County Council (*LA with zoo / safari park*)
- **Jon Averbs**, EHO London Port Health Authority
- **Simon Rowell**, Suffolk Coastal Port Health Authority (*OV representing APHA*)
- **Robert Quest**, Heathrow live animal BIP and illegal imports for Greater London Area City of London
- **Michael Seton**, Veterinary Service team leader City of London (*Animal Reception Centre at Heathrow, The Ports (Tilbury & Thamesport) & covering animal health obligations for LAs in Greater London*)
- **Richard Baker**, UK Border Agency Heathrow (*illegal imports of animal products*)
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## Annex 6 - List of Disease Specific Legislation

Below is a list of the key disease specific legislation regarding exotic animal disease.

### Avian Influenza:-

The Avian Influenza and Influenza of Avian Origin in Mammals (England) (No.2) Order 2006  
Directive 2005/94/EC on measures for the control of avian influenza  
The Avian Influenza (H5N1 in Poultry) (England) Order 2006  
The Avian Influenza (H5N1 in Wild Birds) (England) Order 2006  
The Avian Influenza (H5N1) (Miscellaneous Amendments) Order 2007  
The Avian Influenza Preventive Measures (England) Order 2006  
The Avian Influenza (Vaccination) (England) Regulations 2006

### Newcastle Disease:-

Directive 92/66/EEC on measures for the control of Newcastle disease Diseases of Poultry (England) Order 2003 (this also covers other designated diseases)

### Avian Influenza and Newcastle Disease:-

The Avian Influenza and Newcastle Disease (England and Wales) Order 2003

### Psittacosis or Ornithosis:-

Psittacosis or Ornithosis Order 1953

### Foot-and-Mouth Disease:-

Directive 2003/85/EC on measures for the control of foot-and-mouth disease  
The Foot-and-Mouth Disease (England) Order 2006

### Swine Vesicular Disease:-

Directive 92/119/EC on measures for the control of certain animal diseases and specific measures relating to swine vesicular disease  
Swine Vesicular Disease Order 1972  
Swine Vesicular Disease (Compensation) Order 1972

### Classical Swine Fever:-

Directive 2001/89/EC on measures for the control of classical swine fever  
Classical Swine Fever (England) Order 2003

### African Swine Fever:-

Directive 2002/60/EC on specific provisions for the control of African swine fever  
African Swine Fever (England) Order 2003

### Bluetongue:-

Directive 2000/75/EC on specific provisions for the control of bluetongue  
Regulation (EC) No 1266/2007 regarding measures for bluetongue

Bluetongue Regulation (EC) No 289/2008 regarding measures for bluetongue  
The Bluetongue Regulations 2008

Rabies:-

Rabies (Control) Order 1974  
Rabies (Importation of Dogs, Cats and Other Mammals) Order 1974  
Rabies (Compensation) Order 1976

Anthrax

Anthrax Order 1991

Aujeszky's Disease:-

Aujeszky's Disease Order 1983  
Aujeszky's Disease (Compensation for Swine) Order 1983

Warble Fly:-

Warble Fly (England and Wales) Order 1982  
Warble Fly (England and Wales) (Infected Areas) Order 1985  
Warble Fly (Ascertainment of Infestation) (England and Wales) Order 1985

Enzootic bovine leukosis:-

Enzootic Bovine Leukosis (England) Order 2000  
Enzootic Bovine Leukosis (Compensation) Order 1980

Equine diseases:-

Equine Viral Arteritis Order 1995  
Infectious Diseases of Horses Order 1987  
Directive 90/426/EEC on animal health conditions governing the movement and import from third countries of equidae  
Equine Infectious Anaemia (Compensation) (England) Order 2006

## Annex 7 - List of Tables

<b>Table No.</b>	<b>Title</b>	<b>chapter</b>
1	List of notifiable exotic diseases in scope	2
2	Description of the summary scores for each category in the disease prioritisation tool	2
3	Exotic animal disease outbreaks in GB 2000-08	3
4	Probability categories used by the European Food Safety Agency	3
5	Nodes and pathways raised as medium or 'unknown' risk by experts	3
6	Risk to the GB animal population of importing a live animal with a particular disease through EU and third country trade	3
7	Imports of meat products in 2007	3
8	Risk to GB animal population of importing an animal product into the UK with the disease from EU or third country trade	3
9	Number of animal pathogen transfer licences issued in 2008	3
10	Notifiable exotic diseases in scope and their respective classifications under ACDP and SAPO	3
11	Number and type of livestock in GB on 1 June 2008	3
12	Number of individual animal movements in England and Wales in 2008	3
13	Fragmentation of land parcels on 133,000 CPHs in England and Wales	3
14	Number of livestock markets in Great Britain, 2008	3
15	Notifiable exotic diseases and priority risk pathways	3
16	Formal enforcement actions under the Animal Health Act 1981 and other animal health and welfare legislation enforced by local authorities in 2007	4
17	Total number of other enforcement actions undertaken as recorded on AMES by local authorities during 2007	4
18	What level of confidence do we have in existing measures to managed and mitigate the high risk pathways and how influential are other factors in controlling and enforcing these measures	4
19	Challenges identified in interviews with experts and delivery partners workshop	5
20	Suggested actions from the delivery partners workshop	5
21	Challenges identified in interviews with experts and the delivery partners workshop mapped against the "critical control points" on the high risk pathways	6
22	Level of resilience of each of the high probability risk pathways	6
23	Definitions used to rate the pathways high, medium or low against the criteria	6
24	The descriptions for the overall resilience ratings for the pathways	6
25	Recommended actions for stage 2 of the project	7
26	Final recommendations to enhance the resilience of the 4 priority pathways	9
27	Recommendations to validate and build upon the findings of the report	9

## Annex 8 - List of Figures

Figure No.	Title	chapter
1	Example summary presentation of comparative normalised scores for the impact of 4 exotic diseases (chart is based on example data at December 2008, yet to be validated and published)	2
2	Worldwide distributions of four major exotic animal diseases: Foot and Mouth Disease, Classical Swine Fever, Highly Pathogenicity Avian Influenza and Sheep and Goat Pox	3
3	Pathways and nodes of highest relative risk from scenario 1	3
4	Pathways and nodes of highest relative risk from scenario 2	3
5	Pathways and nodes of highest relative risk from scenario 3	3
6	Relative occurrence of significant animal diseases transmissible in animal products	3
7	Seizures of illegal imports (number of consignments of less than 20kg in weight of meat) during 2007-08 and the relative risk status of countries in SE Asia during 2008	3
8	Maps showing the density (number per km <sup>2</sup> ) of cattle, poultry, pigs and sheep in UK Census areas on 1 June 2007.	3
9	Map of animal movements between 20-23 February 2001	3
10	Map of second largest SOA in England and Wales	3
11	Direction and types of 17.6 million sheep movements recorded on the AMLS in England and Wales in 2003	3
12	Direction and types of 11.8 million pig movements recorded on the AMLS in England and Wales in 2003	3
13	Seasonal distribution maps of the Mallard ( <i>Anas platyrhynchos</i> )	3
14	Wild bird surveillance priority counties in GB	3
15	Distribution of reports of feral pig / free-ranging wild boar in England from 1980 to June 2006	3
16	Simplified risk pathways for incursion of exotic disease into the free-ranging wild boar population in England	3
17	Import controls and responsibilities	4
18	Licensing and inspection responsibilities for high risk premises	4
19	Movement controls and identification requirements and responsibilities	4
20	Animal Health offices in GB and proportion of inspections carried out on imports that fail	4
21	“Word cloud” from the SWOT analysis at the workshop with delivery partners	5
22	The criteria considered when assessing our resilience against each of the high probability pathways	6
23	Breakdown of the main client sectors of the express industry	8
24	Destinations from where express parcels are received	8
25	Avian influenza: wild bird surveillance priority counties	8
26	Commissioning future reviews of risk pathways	10