



Livestock Diseases

PREVENTION, CONTROL AND COMPENSATION
SCHEMES



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Foreword

This report is an overview of the management of risk due to livestock diseases, a potentially catastrophic type of risk that can have strong external effects given its links to the food chain and to human health. Animal disease, primarily in farmed livestock, has long been a policy concern for food safety reasons and the high economic losses it can engender. The globalisation of trade and human movement, and sensitivities to food safety, enhance the relevance and complexity of disease control for terrestrial livestock. Outbreaks – or even rumours of an outbreak – can result in widespread consumer alarm, disruption of trade, and severe effects on incomes, not to mention the human cost of illnesses and deaths arising from animal disease.

Most governments are widely involved in the prevention and control of diseases that affect the livestock sector. In recent years, there have been a series of animal disease alarms in a wide range of countries, and governments have developed considerable experience and resources in this area. They are nevertheless confronted with significant biotechnical and socio-economic complexities in dealing with actual and potential outbreaks of animal diseases amongst a wide variety of livestock which are in the care of thousands, even millions, of farm producers and others.

This area is also complex in institutional terms. There may be various levels of government (e.g. federal, state, local), as well as different ministries and agencies (e.g. agriculture, finance, veterinary, border control) with significant interests. The private sector involves a range of farm livestock producers (e.g. large and small, accessible and remote, specialised and diversified, more or less knowledgeable), as well as their input suppliers (e.g. of feed, and veterinary services) and downstream processors. Engaging and co-ordinating these individuals and organisations is a formidable task when developing an animal disease policy. In addition, given that disease outbreaks can cross borders, there is a role for international organisations to generate and distribute knowledge (e.g. general scientific, economic, and day-to-day in the case of outbreaks) and co-ordinate policy actions.

This report is a comparative analysis of the experiences of prevention systems, institutional planning, outbreak controls and compensation schemes. Eight countries were studied, taking into account the history, culture and political system of each. Lessons of common interest and potentially wider applicability in the pursuit of greater effectiveness and efficiency are identified. A crucial lesson of this exercise is that incentives are important: if the appropriate agents do not consider it in their own best interests to adopt practices of animal husbandry for disease prevention, and reporting and reacting to disease outbreaks, no policy framework can be expected to work well.

Chapter 1 outlines several general economic issues of disease prevention, followed by a description of the relevant role played by international organisations. Drawing on the country studies, Chapters 2 and 3 deal respectively with disease prevention and control systems, and with compensation schemes. They draw some general conclusions in terms of common features and key differences in policy efficiency. Eight subsequent chapters deal with each country study in some depth, generally following a similar structure depending on whether the focus is on disease prevention and control, and/or on compensation arrangements.

This report is the latest in a series of studies undertaken by OECD in the area of risk management in agriculture (www.oecd.org/agriculture/policies/risk). It combines the findings of two comparative analyses, commissioned by the OECD in 2011, one on animal disease prevention and control systems and the other on compensation and cost-sharing schemes covering five countries and eight countries respectively.

Acknowledgements

This publication is based on two consultant reports commissioned by OECD in November 2011 on the management of risks from livestock diseases. Jesús Antón leads the risk management project at OECD and has co-ordinated this work. Ken Thomson has edited the volume and Michèle Patterson has provided editorial assistance.

The two consultant groups commissioned were Civic Consulting (Germany) and Phylum Consulting (France). Their reports covered two complementary areas, respectively, compensation and cost sharing systems, and prevention and control systems in selected countries. The two reports were:

- *Management of risks from epidemic livestock diseases: Overview of key issues and comparison of compensation and cost-sharing systems in selected countries*, prepared by a team from Civic Consulting (Germany) led by Frank Alleweldt and Donald Blondin. It covers five countries: Australia, Canada, Germany, The Netherlands and Viet Nam.
- *Management of risks from epidemic livestock diseases: Review and comparison of Prevention and Control systems in selected countries*, prepared by a team from Phylum Consulting (France) led by Francois Gary, and Mathilde Saulnier. It covers five countries: Australia, Botswana, Brazil, Canada and France.

These reports involved consultations with many experts and institutions in the different countries and international organisations. In particular:

Civic Consulting would like to express its sincere gratitude to all supporters of this report, including officials from Animal Health Australia (Dr Eva-Maria Bernoth); Agriculture and Agri-Food Canada (Bruce Stephen, Elise Legendre, Ian Rogalski, Todd Hunter, Ryan Brunt, Pascal Tanguay, and Nicole Johnson); the Canadian Food Inspection Agency (Wendy Shearer); the German Federal Ministry of Food, Agriculture and Consumer Protection (Dr Hans-Joachim Bätza); the *Tierseuchenkasse* of the federal state of Lower Saxony (Dr Uta Flebbe); the Dutch Ministry of Economic Affairs, Agriculture and Innovation (Inge Hardenberg and Quirien Boone); and the Ministry of Agriculture and Rural Development in Viet Nam (Dr Do Huu Dung and Dr Nguyen Thanh Son). Senior officials at the OIE (Dr Bernard Vallat), WTO (Gretchen Stanton), FAO (Dr Juan Lubroth), and WHO (Dr Bernadette Abela-Ridder) also spent significant time in informing this study through in-depth interviews and document provision. We would also like to thank OECD, as well as OIE, staff members for their collaboration and assistance in providing contact points at various national-level bodies and selected international organisations.

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Acronyms

AGA	Animal Production and Health Division (FAO)
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BHV1	Bovine Herpes Virus Type 1
BSE	Bovine Spongiform Encephalopathy
CBPP	Contagious Bovine PleuroPneumonia
CSF	Classical Swine Fever
CVO	Chief Veterinary Officer
EAD	Emergency Animal Disease (Australia)
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (FAO)
EU	European Union
FAO	Food and Agriculture Organisation
FVO	Food and Veterinary Office
FMD	Food and Mouth Disease
GDP	Gross Domestic Product
GF-TADs	Global Framework for the Progressive Control of Transboundary Animal Diseases (FAO/OIE)
GLEWS	Global Early Warning System for Major Animal Diseases, including Zoonoses (FAO/WHO/OIE)
HPAI	Highly Pathogenic Avian Influenza
LPAI	Low Pathogenic Avian Influenza
NAFTA	North American Free Trade Agreement
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OIE	World Organisation for Animal Health (<i>Office Internationale des Epizooties</i>)
PPP	Purchasing Power Parity
PRRS	Porcine reproductive and respiratory syndrome
PVS	Performance of Veterinary Services (OIE)
PVS Tool	Tool for the Evaluation of Performance of Veterinary Services (OIE)
RAs	(Movement) restricted areas
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures (WTO)
SPS Committee	Committee on the Application of Sanitary and Phytosanitary Measures (WTO)

STDF	Standards and Trade Development Facility (WTO/World Bank/FAO/WHO/OIE)
TSE	Transmissible Spongiform Encephalopathy
VLU	Veterinary Livestock Unit
VS	Veterinary Services
WAHID	World Animal Health Information Database (OIE)
WAHIS	World Animal Health Information System (OIE)
WHO	World Health Organisation
WTO	World Trade Organisation

Executive Summary

Governments are increasingly acting to prevent and control livestock diseases that can cause major harm to human health (zoonoses) and/or to economic enterprises through their effects on income, trade and third parties. Policies in this area can be pursued in a number of ways. These include regulations and advisory/education systems, and compensation schemes to incentivise producers, veterinarians and others to take appropriate actions. However, in order to ensure efficiency, the nature and financing of these prevention, control and compensation schemes need to be carefully considered, given the need to involve a variety of stakeholders in both design and implementation.

Infectious livestock diseases cause significant negative economic impact on livestock production and trade, and in some instances public health. Yet even where losses are significant enough to raise societal concerns, this does not by itself justify policy measures and compensation. Preventive measures have externalities and “animal health” has public good characteristics, but the extent to which they benefit society as a whole or only a given industry depends on the specificities of each disease. The rationale for government intervention is to internalise these externalities and to provide public goods. Economic and policy makers need to decide what type of measures will be taken and the total amount of resources to be allocated.

In both the design and implementation of animal health policies, a number of international organisations play important roles. These include monitoring developments in animal disease, and fostering collaboration between countries to reduce the extent and effects of the disease spreading. The World Organisation for Animal Health (OIE) fixes the international standards recognised by the World Trade Organisation (WTO) and the World Health Organisation (WHO). The Food and Agriculture Organisation (FAO) maintains a Crisis Management Centre – Animal Health (CMC-AH) as a rapid response mechanism for transboundary animal disease emergencies. There are also regional organisations and agreements such as the European Union (EU), the North American Free Trade Agreement (NAFTA) and Mercosur (the Southern Common Market in the Americas) that play a significant role in this area.

Livestock health systems

The organisation of the animal health system in a country is the consequence of a number of factors, including its epidemiological history (e.g. a record of foot-and-mouth disease outbreaks), political organisation (e.g. federalism), the importance of animal production and trade in the national economy, and the country’s culture (e.g. as regards public-private sector relationships). A comparative analysis of livestock disease prevention and control systems in five countries (Australia, Botswana, Brazil, Canada and France) identified a number of key policy factors.

- *Animal health policy is an inter-professional issue.* Even though animal health policy is driven by the official Veterinary Services, farmers, animal product industries and veterinarians must be involved in the definition and the implementation of the animal health policy. For example, Animal Health Australia is a private-public partnership with a strong consensus on the management of different kinds of diseases.

- *A clear chain of command with strong co-ordination and precise sharing of responsibilities* between the different private and public institutions, and local and national authorities. Canada provides a model involving all partners under the supervision of one agency, the Canadian Food Inspection Agency (CFIA).
- *Information, training and communication* are important in making all actors, and especially farmers, aware of animal health issues. The work done locally by the *Groupeements de Défense Sanitaire* (GDS) in France involves all farmers, and in Canada the continuing education campaigns and tools provided for private veterinarians and their accreditation is a way to maintain competencies at field level.
- *Co-financing of animal health policy between private partners (farmers, food industry) and public authorities* is needed to maintain the economic interest of the livestock sector in animal health policy. Different strategies are possible for organising private contributions through direct fees or levies collected at several steps of the food chain.

Compensation scheme designs

Compensation schemes for direct losses from control measures create incentives for early reporting and exist in all investigated countries (Australia, Canada, Germany, the Netherlands and Viet Nam). There are significant similarities and differences.

- *All compensation schemes base indemnification amounts on market value, but effective compensation amounts vary.* Australia's scheme probably provides the highest effective level of compensation, namely the market cost of restocking. Viet Nam's compensation rate of 70% of market value is the lowest observed for the schemes scrutinised. However, Germany uses the date on which culling is ordered as the basis for market value assessments; thus, compensation rates there can be a relatively low percentage of the pre-outbreak market price. Canada, like Germany, places explicit limits on compensation rates. The Netherlands indemnifies the full market value of healthy animals but maintains perhaps the most severe compensation reductions for visibly sick and dead animals.
- *Several dissimilarities appear in the cost-sharing aspect of the scheme designs.* In Australia and Germany, the relevant governments always pay a portion of outbreak control costs, while in the Netherlands such costs are covered entirely by the livestock industry up to negotiated contribution ceilings. In Germany and the Netherlands, industry contributions are paid *ex ante* and *ex post* in nature, while in Australia they are entirely *ex post* (though with limited "peace-time" contributions, in the form of membership fees).
- *A key difference in the financing of the publicly funded schemes* is that the Canadian compensation scheme is entirely funded through the federal budget, while the funds for Viet Nam's compensation payments generally come from both central government and provincial funds.
- *There appears to be considerable scope for variants of animal disease compensation and complementary schemes, tailored to specific industry/disease situations.* Complementary insurance schemes, in particular for consequential losses, exist in some countries but are only widely available in Germany. Other policy instruments are also needed to work in a complementary way with any system of compensation payments – such as enabling legislation, taxation by means of producer levy payments, and institutional arrangements to administer the scheme.

PART I.

OVERVIEW OF LIVESTOCK DISEASE PREVENTION

Chapter 1.

Economic issues and the role of international organisations¹

This chapter concerns the management of livestock diseases liable to become epidemic or even pandemic, i.e. that can spread from an endemic disease source to a wider population within the country, or even beyond. The consequences of such outbreaks may concern not only the affected livestock species, but also the trade of livestock or their products both at the domestic (regional or national) and international levels, human health in the case of zoonoses, and other economic sectors.

Outbreaks of animal disease have a number of economic impacts that range from direct losses for livestock producers to “third-party” effects. Standard cost-benefit analyses offer some economic guidance, but are complicated by issues of risk and uncertainty, and the prevalence of “club good” and “public good” characteristics of contagious livestock diseases.

International organisations and agreements, such as the OIE, the European Union and Mercosur, play an important role in informing, guiding and co-ordinating national policy designs and actions in the presence of livestock disease, e.g. via maintaining databases, setting standards and providing negotiation forums.

Animal health is an important issue for the development of livestock production. Broadly speaking, the control of the main contagious animal diseases is a prerequisite for investment in animal production. It also ensures the development of safe international trade of animal products through the control of transboundary diseases. Major recent outbreaks over the last ten years have shown that the consequences of disease are not limited to the direct economic losses generated by the disease in terms of reduced output and fallen (dead) livestock, but also to indirect impacts, such as decreased consumption (and/or price collapse) of animal products, and international trade disruption. Furthermore, animal health is also a public health issue as regards zoonoses. Recent outbreaks of Highly Pathogenic Avian Influenza have been a reminder that the best strategy to protect the human population is to control or to eradicate the organism in the animal population.

Each country has developed its own system to prevent and control animal diseases through their veterinary services, private and/or public. The organisation of this system of prevention and control depends on the structure of animal production in the country, on the current and past epidemiological situation, and on administrative and regulatory cultures. The sharing of responsibilities is different between countries, and animal health risk management depends on the involvement of both producers and governments, and on the consensus on animal health policy objectives between these two partners. In helping countries to make their choices of animal health policy design and implementation and to fight the spread of contagious diseases, international organisations – primarily the World Organisation for Animal Health, the OIE – have played an important role in sharing information on the sanitary situation of each country. The OIE has also defined common rules to control major contagious diseases, based on international expertise; these rules are formalised in the OIE Code. More recently, the OIE has developed international standards on the organisation of veterinary services.

Animal disease policy involves a large number of activities carried out by public and private actors, including governments, parastatal agencies, farmers, veterinarians, non-governmental organisations (NGOs), and industry partners. Given the range and complexity of the technical and institutional issues, and on the limited resources available, decisions on policy strategies and actions need to be made on the best possible assessment of alternative costs and returns, taking into account risks. The focus of this chapter is on the basic economics of policy and policy-related action taken with the aim of livestock disease control, and on the roles of a number of major international organisations and agreements which are directly or indirectly involved.

1.1. Economic issues

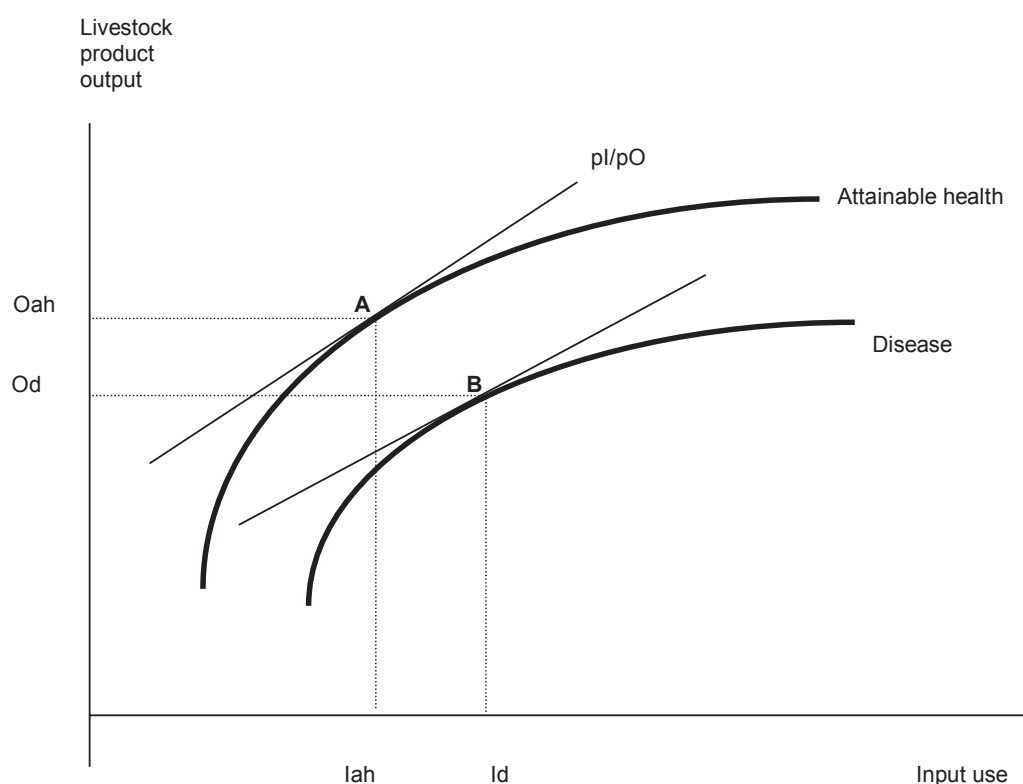
It is widely recognised that disease in farm animals has a significant economic impact on livestock production, and incurs substantial costs for societies in both developed and developing countries. Epidemic trans-boundary animal disease, due to its infectious and rapidly spreading nature, can have particularly large and extensive economic impacts, especially in the case of zoonoses. Disease in livestock has nine main economic impacts:

- a loss of capital (i.e. animal mortality)
- a reduction in the level of marketable outputs
- a reduction in (perceived or actual) output quality
- a waste (or higher level of use) of inputs
- resource costs associated with disease prevention and control
- human health costs associated with diseases (zoonoses) or disease control

- negative animal welfare impacts (i.e. animal suffering) associated with disease
- international trade restrictions due to disease and its control; and
- a range of other impacts such as effects on rural economies, tourism, the environment, etc.

The effects of livestock disease on producers can be analysed using a standard input-output response curve. However, the incidence, intensity and duration of all these economic impacts are subject to risk and uncertainty, which complicate the design of management policies for epidemic diseases. In order to illustrate the direct impacts of livestock disease on production, it must be assumed that points on the input-output curve are expected or average values for a typical producer, as in Figure 1.1. Given input and output prices, p_I and p_O respectively, disease in livestock leads producers to operate at equilibrium point B rather than point A, which means that output of livestock products is lower by $O_{ah} - O_d$ and use of inputs (feed, veterinary medicines, etc.) is higher by $I_d - I_{ah}$.

Figure 1.1. The effect of livestock disease on production

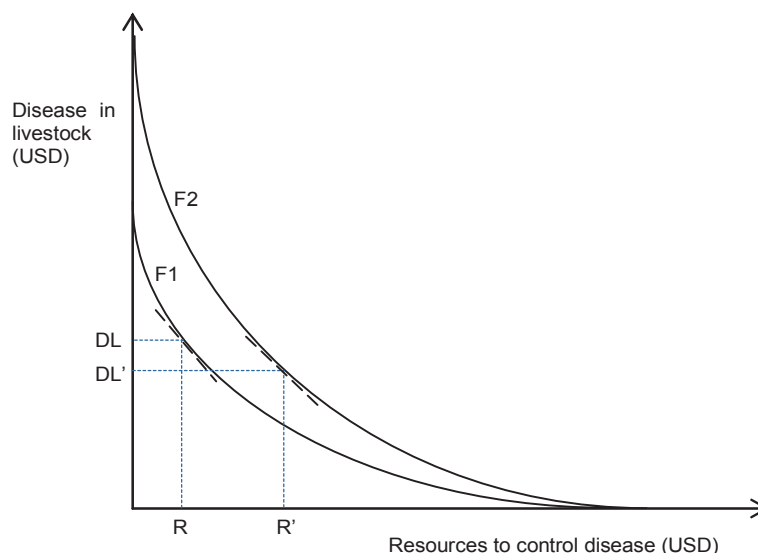


Source: Bennett (2003).

In addition to the direct effect on production, livestock disease and its control have a number of indirect effects on third parties. These effects are often referred to as “externalities” which occur when an individual’s production or consumption affects the production or consumption of others through means other than market prices. In the context of livestock disease, important potential negative externalities include impacts on the livestock of other producers, on human health, and on animal welfare. Because such important externalities are not taken into account in markets, they are a potential source of “market failure”, i.e. resources are not allocated in an optimal way, and human welfare is lower than it might otherwise be.

Thus, there are difficult decisions to make concerning the quantity of resources which should be devoted to disease control in order to achieve an economic optimum which maximises the net welfare of a society. Figure 1.2 contains a loss-expenditure curve (F1) which shows the relationship between resources used to control disease and the economic impact of livestock disease, both in money terms. The economically optimal level of expenditure on disease control is shown first at the level of resource expenditure R and disease loss DL . This is the combination of disease control expenditure and disease loss where the total costs of disease ($DL+R$) are minimised. However, if the value of disease losses is actually higher than supposed, for example due to the externalities mentioned above, then the loss-expenditure curve might be as shown by F2. In such a case, the optimum level of resource expenditure should be at a higher level, R' , and disease losses lower at DL' . In this theoretical case, the fact that the curve cuts the x-axis shows that the disease could be eradicated, although it would not be the least-cost economic optimum.

Figure 1.2. Livestock disease loss-expenditure frontier



Note: F1 is the situation where externalities are not taken into account whilst F2 takes externalities into account.

Source: Adapted from McNerney, J. (1999), "Livestock disease as an economic problem", in Bennett, R.M. and Marshall, B.J. (eds.) *Economic Assessment of Livestock Disease Problems*. University of Reading, UK, pp. 25-40.

Control of livestock disease also has important "public good" characteristics. In the economics discipline, "public goods" (which can include services) are those that, even if they are consumed by one person, can still be consumed by other people. In effect, such goods are inexhaustible in terms of their consumption. In addition, it is not possible to exclude people from consuming such goods. In the context of livestock disease and its control, good (i.e. high-standard) biosecurity and disease risk management is a public good, as is good animal welfare (for example, the OIE considers veterinary services to be a global public good; see web.oie.int/eng/OIE/organisation/en_vet_serv.htm). This is in part linked to the public health impact of certain livestock diseases, i.e. zoonoses. For example, good biosecurity at a country's borders against a zoonotic livestock disease benefits everyone within the borders of that country, regardless of how many people that is or whether they pay anything towards the cost of the good (e.g. whether they are taxpayers or not). Similarly, good biosecurity by

livestock farmers benefits all other livestock farmers, whilst poor biosecurity, even of one livestock farmer, may increase the disease risk for all farmers (a negative externality associated with that farmer's actions which is, in effect, a public "bad" for other farmers and possibly for society more generally).

The term "club good" is sometimes used where, for example, producers belong to a farm assurance scheme or similar organisation, and benefit from some of its activities, such as information provision, from which others who do not belong to the scheme cannot benefit. In the case of some diseases, biosecurity may largely benefit a particular group of producers or industry (e.g. cattle farmers) rather than wider society or even a wider group of livestock farmers (i.e. is an "industry good"). Items such as "good biosecurity" or "good animal welfare" are sometimes called non-market "merit goods"² because, though society deems them desirable, they are not traded in markets (although goods associated with these characteristics might be – such as livestock sold with disease-free accreditations, or free-range eggs).

Underestimating the benefits of good farm biosecurity by not taking into account the externality and public good aspects can lead to a misallocation of resources for disease control (Figure 1.3). The private benefits for farmers practising good biosecurity, shown as PB, lead to an optimal level of resource to control disease of R1, which is where net (private) benefits are maximised. However, taking into account the externality and public good aspects of biosecurity, shown by the total benefit curve TB, results in a greater (optimal) use of resource devoted to biosecurity disease control (R2) and a greater net benefit to society (particularly to livestock farmers).

The associated marginal cost and benefit curves (showing the change in costs or in benefits as resource use changes) are shown in the lower section of Figure 1.3 (effectively, these are supply and demand curves for disease control). These curves show an equilibrium where resource use to control disease/for better biosecurity is valued at V1 in private markets, whereas its full value to society should mean that it is valued at V2. If livestock producers received V2 instead of V1 for implementing disease control, then, in theory, the economic optimum for society could be achieved because producers would respond to the price incentive and provide quantity R2 at price V2, as shown by the market equilibrium point where MTB (demand) is equal to MTC (supply).

The reasons for government or other authority to intervene in markets include problems associated with the following.

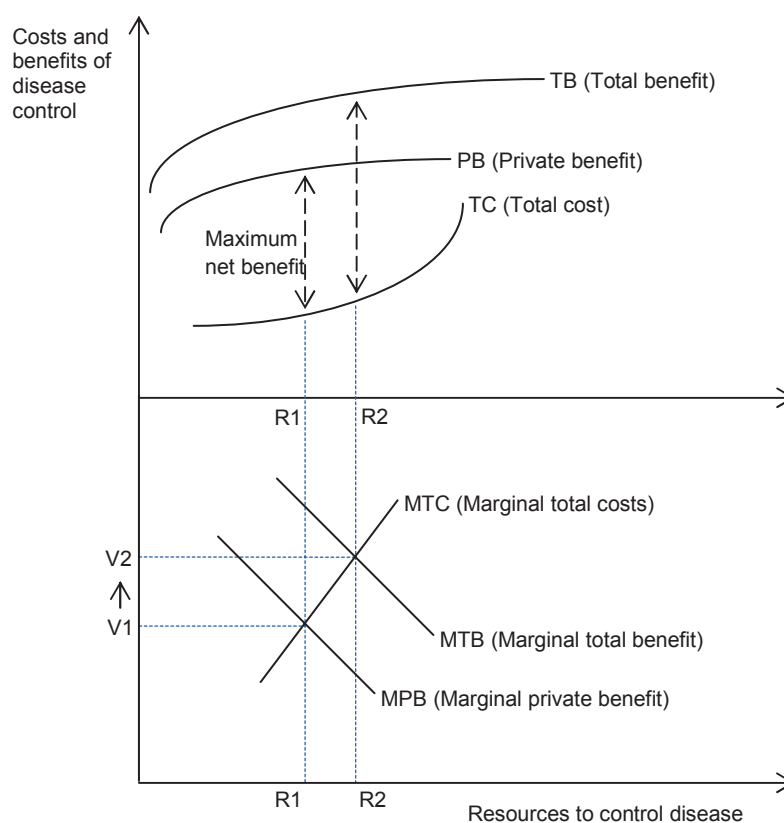
- Competitiveness, e.g. monopoly power, such as in the provision of pharmaceutical products for livestock.
- The presence of negative externalities, such as risks to human health or animal suffering.
- The provision of public goods, such as biosecurity and animal welfare.
- Information inadequacies, e.g. which prevent the efficient functioning of markets, such as disease or welfare status of livestock.
- Issues of (in)justice and (in)equity, such as rationing during times of great scarcity, or compensation payments for loss.
- A range of socially desirable goals, including the provision of merit goods, i.e. goods that are felt to be needed by all members of society on grounds of "need" or fairness.

A range of measures or policy instruments can be used or encouraged by governments to address the issues raised by animal disease. Below, Table 1.1 categorises these, ranging from

legislation and direct action by government, the payment of incentives (e.g. V2-V1 in Figure 1.3) or the use of taxation, to institutional arrangements and/or self-regulation. Amongst the various policy instruments listed is compensation.

Compensation involves something, typically money, being given to someone as a recompense for loss, injury, or suffering. There is usually a presumption that the loss or injury is not caused by, or is not the fault of, the person or persons on whom the loss falls. Compensation to injured parties may be paid by those responsible for the injury or loss, or by a third party such as insurers or by government (on society's behalf). In the context of livestock disease, injury or loss may be either as a result of disease (i.e. mortality, morbidity, effects on sales/markets, etc.) and/or as a result of disease control strategies (e.g. compulsory slaughter, vaccination, movement restrictions).

Figure 1.3. Optimal levels of disease control/biosecurity



Note: R1 is the optimal level of resource use to control disease when externalities are not taken into account, whilst R2 is the optimal level once externalities are taken into account.

Source: Adapted from McNerney, J. (1999), "Livestock disease as an economic problem", in Bennett, R.M. and Marshall, B.J. (eds.) *Economic Assessment of Livestock Disease Problems*. University of Reading, UK, pp. 25-40.

Table 1.1. Types of government intervention instruments and their relative strengths and weaknesses

Type of policy instrument	General example	Example applied to animal health and welfare	Strengths	Weaknesses
1. Legal rights and liabilities	Rules of tort law	EU/EC Treaties WTO Agreements	Self-help	May not prevent events resulting from accidents and/or irrational behaviour
2. Command and control	Secondary legislation Health and safety at work	Animal standstill	Force of law Forceful Minimum standards set Immediate Transparent	Intervention in management Incentive to meet but not exceed standards Costly Inflexible
3. Direct action (by government)	State provision of goods or services (e.g. housing)	Animal slaughter, treatment, or inspections by state veterinarians Border controls	Assures acceptable/ desired level of provision	Danger of being perceived as “heavy-handed”
4. Public compensation/ social insurance	Unemployment benefit	Compensation for animals slaughtered for disease control or welfare reason EU CAP Pillar 1 cross-compliance Pillar 2 monies for farm animal health and welfare improvements	Insurance provides economic incentives	May provide adverse incentives Can be costly to taxpayers
5. Incentives and taxes	Car fuel tax	EU CAP Pillar 1 cross-compliance Pillar 2 monies for farm animal health and welfare improvements	Low regulator discretion Low cost application Economic pressure to behave acceptably	Rules required Predicting outcomes from incentives difficult Can be inflexible
6. Institutional arrangements	Departmental agencies, levy boards, local government	Animal health and welfare institutions and authorities	Specialist function Accountability	Potential for narrow focus of responsibility
7. Disclosure of information	Mandatory disclosure in food/ drink sector	Reporting of notifiable diseases Animal welfare labelling	Low intervention	Information users may make mistakes
8. Education and training	National curriculum	Animal health and welfare in veterinary education, national school curricula, etc	Ensures education and skills required by society	Can be too prescriptive and inflexible
9. Research	Research Councils	Funding for animal health research through government funded bodies	Provide information to policy	May duplicate or displace private sector activities
10. Promoting private markets a) Competition laws	Office of Fair Trading Airline industry Telecommunications	Market power of companies in the food supply chain and prices to farmers to meet production costs	Economies of scale in use of general rules Low level of intervention	No expert agency to solve technical/ commercial problems in the industry Impact of global commodity costs Uncertainties and transaction costs

Type of policy instrument	General example	Example applied to animal health and welfare	Strengths	Weaknesses
b) Franchising and licensing	Rail, television, radio	Veterinary drugs/treatments Animal husbandry equipment	Low cost (to public) of enforcement	May create monopoly power
c) Contracting	Local authority refuses services	Private veterinarians conducting public services missions	Combines control with service provision	Confusion of regulatory and service roles
d) Tradable permits	Environmental emissions Milk quotas	Permits for intensive livestock production systems (eg the Netherlands)	Permits allocated to greatest wealth creators	Require administration and monitoring
11. Self-regulation	Insurance industry	Farm assurance schemes, veterinary profession, industry codes of practice	High commitment Low cost to government Flexible	Self-serving Monitoring and enforcement may be weak
a) private				
b) enforced	Income tax	Animal health guidelines and codes (eg UK Defra animal "welfare codes")		

Source: Adapted from Bennett, R and Appleby, A (2010) Animal welfare policy in the European Union. In: Oskam, A., Meester, G. and Silvis, H. (eds.) *EU policy for Agriculture, Food and Rural Areas*. Wageningen Academic Publishers, The Netherlands, pp. 243-251.

Compensation may be claimed for the indirect effects on farm businesses, such as the (in)ability to trade, or wider third-party effects on others, such as impacts along the food supply chain or on other sectors (e.g. tourism). All those incurring loss or injury may seek compensation, either from those thought to be responsible for (i.e. to cause) the harm, or from government.

Compensation can act in a similar way to insurance (a system of provision of financial protection against specified contingencies, such as loss or injury), although the latter usually requires payment of an insurance premium. Indeed, the basis of many insurance policies is to provide compensating financial amounts in cases of specified loss or injury.

Many governments have livestock disease compensation schemes, usually relating to disease control measures that are compulsorily imposed on livestock producers. If government does not intervene in the form of compulsory disease control measures, then compensation may not be paid to individuals suffering loss.

The design of a compensation scheme must cover the scope and level of the compensation (e.g. which animals and diseases, and what claimants), and its implementation (e.g. responsibilities, and speed of claim and payment). It must also cover its financing, whether from public funds (and if so at what level(s) of government) and/or from private sources (e.g. an insurance scheme), possibly financed from mandatory payments (e.g. through vaccinations, slaughterings or permits for animal movements).

The design of a compensation scheme must also take account of "moral hazard", i.e. the tendency for an individual livestock producer or processor to take less care over biosecurity risks because the scheme offers compensation in case of loss (OECD, 2011). Such hazard arises from the "asymmetric" levels of information about disease outbreaks and risk-reducing behaviour available to governments on the one hand and to individuals on the other. To counter such tendencies, compensation rates must not be too generous as to provide adverse incentives: for example, they may be scaled according to perceived risk, linked to market

prices, or made dependent on biosecurity management or reporting requirements (Gramig *et al.*, 2009).

It may be noted that disease outbreaks can bring benefits to some parties, e.g. alternative suppliers of substitute products similar to those removed from the market, and those providing services to the control process, such as disinfection and non-standard slaughtering. In principle, it might be possible to finance at least part of the costs of a compensation scheme from such sources, but the practical difficulties seem formidable.

1.2 International organisations

The international dimension of livestock disease prevention and control arises not only because contagious diseases do not respect country borders if carried by wildlife and/or human populations but because international trade generally operates within a complex framework of multilateral institutions and agreements. International organisations have important roles to play in disseminating information, establishing common rules of behaviour and certification, and providing a forum for negotiation, both during an actual or suspected outbreak, and more generally. This section reviews the roles of the most important such organisations in the area of animal disease policy.

World Organisation for Animal Health (OIE)

The World Organisation for Animal Health predates all other international organisations working in the field of animal health. International trade in animals and animal products increased the need to fight animal diseases at the global level, and as a consequence led to the creation of the *Office International des Epizooties* (OIE) in 1924. In 2003, the Office became the World Organisation for Animal Health but kept its acronym. In 2011, it had a total of 178 member countries and regional and sub-regional offices on every continent (OIE, 2011a).

The most visible role of the OIE is as an international setter of standards. The OIE is the WTO reference organisation for standards relating to animal health and zoonoses, and is recognised in this capacity by the World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement). Two codes and two manuals (Terrestrial and Aquatic)³ published by the OIE serve as the principal reference material for WTO members with respect to the “sanitary safety of international trade in terrestrial animals and aquatic animals, and their products”. The codes have historically focused on animal health and zoonoses, but have recently expanded to address animal welfare, animal production, and food safety, in line with the OIE’s expanded mandate “to improve animal health worldwide” (OIE, 2011c).

Standards developed by the OIE also constitute reference points for European Union animal health legislation and the policy frameworks of OIE member countries for livestock disease risk management. Since 1994, the OIE has maintained voluntary procedures for officially recognising countries’ animal disease status (OIE, 2011b), initially through the awarding of “foot-and-mouth disease-free” status and then similarly for bovine spongiform encephalopathy (BSE), contagious bovine pleuropneumonia (CBPP), and, prior to its recent global eradication, rinderpest.⁴

The OIE also functions as a gatherer of information and, thereby, as a source of transparency with respect to the global animal health situation. Member countries of the OIE are formally required to submit information on the presence of notifiable animal diseases, including zoonoses, within their borders. This data feeds into the World Animal Health Information System (WAHIS) and, in turn, is made publically available (following validation by the OIE) through the World Animal Health Information Database (WAHID). As a result of these procedures, this online portal allows for a survey of the animal health situation in

178 countries. The OIE also currently maintains specific information portals providing updates on the situations regarding avian influenza, bovine spongiform encephalopathy (BSE), foot-and-mouth disease (FMD) and rabies (OIE, 2011b).

One of the key mechanisms employed by the OIE is the Performance of Veterinary Services (PVS) Pathway, a worldwide programme for improving the compliance of countries' veterinary services with relevant OIE international standards on the quality of such services. For a given country, the first step in the terrestrial PVS programme involves utilisation of the OIE Tool for the Evaluation of Performance of Veterinary Services (OIE PVS Tool) to assess the performance of national veterinary services against the international standards contained in the Terrestrial Code. Then, in a second step, a PVS Gap Analysis qualitatively and quantitatively evaluates the country's needs and priorities in veterinary services according to the qualitative outcome of the PVS Tool evaluation. This leads to joint (OIE and national-level) identification of 1) relevant priorities, constraints, and expected results; 2) the actions required to achieve those results; and 3) the tasks and associated resources needed to implement those actions.⁵

Overall, the PVS programme operates mainly to build sustainable animal health systems, as well as to improve disease surveillance and prevention and control systems, allowing for early detection of and rapid response to animal disease outbreaks. Compensation for owners of livestock culled for disease control purposes is seen by the OIE as a key component of those systems. Therefore, while compensation policy is not explicitly included in the relevant section of the Terrestrial Code on Veterinary Services, the concept is relevant in the context of the PVS Pathway. This is because, when a PVS Evaluation diagnoses a lack of, or deficiencies in, a compensation programme in a specific country, one of the priority recommendations will be the establishment or improvement of the programme. Compensation programmes are prioritised because they provide a basis for early reporting of outbreaks of relevant animal diseases and better co-operation on the part of farmers with control measures of veterinary services. More broadly, the OIE considers the containment of transboundary livestock diseases to be a global public good, and sees compensation mechanisms as a key tool in this context, primarily because of their potential to reduce the impact of animal diseases on livestock populations, farmers, broader society, and international trade.

World Trade Organisation

Given its trade mandate, the World Trade Organisation (WTO) plays an indirect role in the animal health field. Under the SPS Agreement, it identifies the animal health standards promulgated by the OIE as the framework on which member countries⁶ should base their sanitary and phytosanitary measures. The intent of the Agreement (which entered into force in 1995) is to balance the sovereign right of national governments to determine and ensure appropriate levels of food safety and animal and plant health against the potential development of unnecessary trade barriers. To that end, the Agreement permits countries to establish their own sanitary and phytosanitary standards, but, where those exceed international standards (set by the OIE in the case of animal health), they must be scientifically justifiable and consistently applied. Thus, "if the national requirement results in a greater restriction of trade, a country may be asked to provide scientific justification, demonstrating that the relevant international standard would not result in the level of health protection the country considered appropriate" (WTO, 2011).

The overseer of the Agreement is the SPS Committee, which comprises representatives from all WTO member countries (currently 153) participating in a given meeting, as well as observers from countries currently negotiating WTO membership and international governmental organisations. Additionally, the Committee develops non-legally-binding guidelines designed to aid in countries' implementations. However, the Committee is not

responsible for legal interpretations required by formal trade disputes. Instead, it serves as a venue where countries can more informally discuss trade issues which they think result from unjustified restrictions. In this setting, policy clarifications and justifications can be discussed, and countries can observe how others are adhering to Agreement obligations.

The WTO secretariat has a mandate to monitor all members' trade policies, including animal health regulations which do or may affect trade.⁷ When a member puts in place new requirements or modifies existing requirements, it must give advance notice to the WTO. Emergency actions taken following an animal disease outbreak must also be immediately notified. However, initiation of a trade dispute process must come from a member country. The SPS Committee, or its chairperson, for example, does not have the authority to lodge a complaint based on the contents of members' notifications. Notably, "specific trade concerns" can be raised in the SPS Committee. These are of a distinctly different, i.e. less formal, nature than full WTO complaints, which invoke the organisation's quasi-judicial dispute resolution mechanism.

About 40% of the issues raised in the SPS Committee to date have been related to animal health or zoonoses, but formal disputes linked to animal health have been rare. With respect to the concerns discussed in the SPS Committee, BSE has featured consistently on meeting agendas since 1996, and member countries' policies related to avian influenza have recently been a focus.

Generally speaking, issues arise when a member's policies are seen by others as deviating from OIE standards in such a way that they impose a substantial trade restriction. So far, compensation for livestock owners' losses resulting from outbreak control measures such as culling has not featured in "specific trade concerns" raised by member countries in the SPS Committee. Only if compensation policy went beyond indemnification of losses to subsidise or incentivise production would it be likely to result in a formal or informal complaint at the WTO. In such a case, it would be the WTO Agriculture Agreement rather than the SPS Agreement which would be applicable. However, countries may initially prefer to discuss management of and potential responses to an emerging animal health situation rather than lodge complaints based on others' early policy responses. In this way, something akin to a "grace period" with respect to new diseases or situations can develop. As reported a WTO official, this has been the experience with avian influenza.

Training and/or capacity-building efforts involving the WTO and aimed at fostering adherence to the SPS Agreement generally take two forms. First, the WTO administers some general training activities for developing countries on their rights and obligations under the SPS Agreement. When conducted on a regional or sub-regional basis, these training sessions comprise representatives from the OIE, as well as animal health officials from the involved countries. Essentially, the WTO, due in part to its lack of specific competence on the technical aspects of animal health, facilitates the provision of animal health training focused on the SPS Agreement and international standards by OIE officials. Second, the WTO is one of five partners, alongside the OIE, the World Bank, the Food and Agriculture Organisation (FAO) of the United Nations, and the World Health organisation (WHO), participating in the Standards and Trade Development Facility (STDF). Acting as both a co-ordinating and financing body, the STDF aims to raise awareness of the importance of SPS issues. It also works to further co-ordination among providers of SPS-related technical assistance and to assist developing countries, through capacity-building projects, in their efforts to meet SPS standards (STDF, 2011). The WTO serves as the administering agency for the STDF, but the implementation of projects related to animal health is normally overseen by the OIE, FAO, or both organisations. To date, according to a WTO official, projects implemented under the STDF have not specifically dealt with epidemic livestock diseases, though such projects would be possible.

Food and Agriculture Organisation

The Food and Agriculture Organisation (FAO) of the United Nations addresses animal health primarily through its Animal Health Service, a body within the Animal Production and Health Division (AGA). The Animal Health Service comprises three large groupings: the Veterinary Public Health group, the Production Disease group, and EMPRES (Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases). EMPRES is the largest of these groupings. It deals predominantly with transboundary animal diseases such as Food and Mouth Disease (FMD), avian influenza, Rift Valley fever, *peste des petits ruminants*, contagious bovine pleuropneumonia (CBPP), and African and classical swine fevers, among others. Some of these diseases also come under the remit of the Veterinary Public Health group or the Production Disease group. In such cases, EMPRES cooperates with the other group(s). The role of wildlife-livestock interactions and the emergence of potential pathogens are also addressed by these units.

The Animal Health Service also works with the Animal Production branch of the AGA on ensuring that the efforts in improving breeding or genetic stock are not crippled by livestock diseases. In addition, it cooperates with the FAO's legal service that works as a specialised group on veterinary and agricultural policy legislation, particularly on ensuring that a country's legislation is in line with applicable international agreement obligations. The Animal Health Service also cooperates with the OIE regarding standards, and undertakes capacity-building at the local level. Additionally, AGA/EMPRES and the OIE collaborate on a joint initiative called the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs). This framework incorporates a global early warning system for transboundary animal diseases (see the description of GLEWS below). Moreover, as a result of collaboration with the WHO, the warning system also functions for the main zoonoses. Another notable body is the Crisis Management Centre–Animal Health (CMC-AH), which is the FAO's rapid response mechanism for transboundary animal disease emergencies, including aquatic and wildlife. The Centre works directly with EMPRES, as well as the OIE and the WHO for technical assistance. It delivers technical and operational assistance to governments for the development of solutions that aim to prevent or stop disease spread.

The Veterinary Public Health group is dedicated to the understanding, prevention, and control of zoonotic diseases and food safety issues. The Production Disease group deals more with diseases originating from parasites, poor nutrition, or unsanitary conditions (i.e. poor water quality or feedstuffs) that are likely to affect long-term production efficiency negatively.

A major initiative involving the FAO, WHO, and the OIE is the Global Early Warning System for Major Animal Diseases, including Zoonoses (GLEWS). It is a joint system that builds on the advantages of combining and co-ordinating disease incident alert mechanisms, epidemiological analyses, and risk assessments from all three organisations, while linking international community networks and stakeholders, to contribute to early warning, prevention, and control of animal disease threats. The FAO contributes through its on-the-ground projects promoting local food security and smallholder production. The FAO also collaborates with the UN Environmental Programme (UNEP), specifically on wildlife diseases, as well as with prominent regional organisations such as the Pan American Health organisation and the African Union Inter-African Bureau for Animal Resources.

Regarding compensation for livestock owners, the FAO works with governments to implement sound compensation strategies by explaining the significant overall cost reductions they may entail by ensuring more rapid disease containment. The main focus recently has been on compensation schemes for avian influenza, and during the past few years the FAO has undertaken many related Compensation Strategy Missions to individual countries. Classical swine fever and FMD have also been addressed.

World Health Organisation

The World Health Organisation (WHO) is a stakeholder interested in safeguarding animal health with the aim of diminishing public health risks arising from animals, including zoonotic diseases (i.e. those with the potential to be naturally transmitted from animals to the humans). The WHO defines Veterinary Public Health as “the sum of all contributions to the physical, mental and social well-being of humans through an understanding and application of veterinary science”, and sees the well-being of humans as “inextricably linked to animal health and production” (WHO, 2011a).

The Department of Food Safety and Zoonoses is tasked with co-ordinating global activities to address health risks at the animal-human-ecosystems interface. For high-impact zoonotic diseases, goals include improvements in governance and infrastructure, including increased national, regional, and global prevention and control capacity. Overall, this work aims to lower the disease burden from food and animals, concentrating on both industrialised and traditional production systems and integrating preventive practices along the product chain. These efforts are undertaken through definition and implementation of sustainable policies and programmes designed to ensure early disease detection, risk assessment, preparedness, and rapid emergency response (WHO, 2011b).

A scientist from the Department of Food Safety and Zoonoses divided ongoing work on zoonotic disease risk management into three areas: 1) policy-level intervention and buy-in, sustainable programme development, and policy implementation undertaken with relevant governments;⁸ 2) co-ordination of technical work on zoonoses with governments and other international governmental organisations in order to achieve national, regional, and global coherence in surveillance, early detection, emergency preparedness, and response;⁹ 3) implementation of policies and technical interventions to ensure that national, regional, and global tools and mechanisms, as well as knowledge and partnerships, are in place for the detection, assessment, and management of risks.

The WHO relies on its close partnership with other organisations, in particular the FAO and OIE, for advancing and co-ordinating activities at the animal-human-ecosystems interface. For example, in cases where a disease in animals (but no animal-to-human transmission) has been observed, the WHO, often in collaboration with its partners, assesses the potential for the disease to emerge from the animal population and cause a public health impact at the local or international level. In this way, the WHO keeps abreast of animal health issues even in cases where there may not initially be an identifiable public health dimension. An example of a disease that has prompted such risk assessments in recent years is avian influenza. Outbreaks of avian influenza signal a need to rapidly emphasise control efforts, because the probability of transmission to humans increases with circulation of the disease, especially in low-biosecurity conditions.

One of the major developments in the WHO’s work on zoonotic diseases in the past decade has been increased co-operation with the OIE and FAO, as exemplified by the tripartite concept note (FAO *et al.*, 2010). Currently, one primary mechanism of collaboration between the three organisations is the GLEWS framework mentioned above. Essentially, GLEWS allows for official verification and alert of a potential risk or disease event. Response to and management of risks are then implemented as needed through the Crisis Management Centre–Animal Health, a joint FAO-OIE effort, and through WHO response mechanisms which may involve the Global Outbreak Alert and Response Network (GOARN).

The WHO does not work on the promotion of schemes that compensate livestock owners for losses incurred as a result of disease outbreak control measures. However, it does promote public health through the development and implementation of best practices for the control,

prevention and response to zoonotic disease. These practices can be tailored to individual country, regional, and global needs.

The WHO monitors the core capacities of member states to detect, control, and prevent zoonotic disease threats through implementation of the International Health Regulations framework (see the WHO *Protocol for Assessing National Surveillance and Response Capacities for the International Health Regulations*, WHO/HSE/IHR/2010.7). The assessment of core capacities is based on country self-assessment, which may have inherent drawbacks. In a reverse notification process, the WHO reports back to its member states on progress it has made on established objectives and performance indicators.

The WHO still sees a need to increase disease alert and containment capacities to ensure that zoonotic diseases are controlled and contained within animal populations before they spill over and become public health problems. Therefore, in the coming years, the organisation will aim for a paradigm shift in prevention and preparedness so as to control and contain risks at the human-animal-ecosystems interface. This will be pursued with renewed commitment to strengthening co-ordination with the OIE and FAO.

1.3. The treatment of animal diseases in selected Regional Trade Agreements

The many multilateral agreements to reduce and manage international trade are established in light of the widely recognised benefits of liberalised international trade, whereby consumers in many countries can benefit from the efficient use of resources by producers in many countries. The membership and product/service range of these agreements vary widely, reflecting different economic and political interests amongst countries which may be neighbours or distant from each other. Through its widespread economic importance and sensitivity as part of the human food chain, trade in livestock forms a significant component of many of these agreements, in an effort to minimise the potential disruption to cross-frontier commerce when a disease outbreak is detected or feared.

The sections below deal with three of the most prominent such agreements in three world regions. The European Union involves 27 member states closely engaged across a wide range of economic, social and other fields. It is not only a major world livestock producer but also a major importer of livestock and livestock products, both from neighbouring countries and from distant developed and developing ones. The North American Free Trade Association and the Southern (American) Common Market Mercosur represent less integrated agreements focussed on trade, but contain members with a wide range of livestock situations.

European Union

The European Union is actively involved in the animal health field, and is engaged both financially and at the regulatory level in the area of disease control and prevention by means of a fully harmonised policy for major animal diseases. The current strategic framework for these activities is the Animal Health Strategy (2007-2013) and associated Action Plan. Adopted in 2007, the Strategy outlines animal health and welfare measures for a six-year period ending in 2013. An increased focus on preventive measures, disease monitoring, controls, and research constitutes a key aspect of the strategy, which aims to limit disease incidence as well as the scale of those outbreaks which do occur (European Commission, 2011).

The Strategy's Action Plan comprises four Pillars: defining priorities; a modern legal framework; prevention and controls;¹⁰ and science, innovation, and research. Pillar 2 broadly seeks to develop a clearer animal health regulatory structure in the European Union, and has two main objectives: the creation of a new modern animal health legal framework, and the development of efficient cost- and responsibility-sharing schemes. The new legal framework

will represent simpler and more coherent animal health legislation, placing more emphasis on prevention and surveillance but at the same time preserving the capacity of the European Union for emergency response. It also introduces disease categorisation as a basis for the prioritisation of EU public intervention. This legislation will provide common animal health rules while leaving flexibility to adjust to new scientific developments, changing circumstances (e.g. emerging diseases and climate change) and specific epidemiologic situations in the different parts of the European Union. Unjustified sanitary barriers will also be avoided. In relation to the cost- and responsibility-sharing schemes, with existing schemes seen as sometimes narrowly focused on provision of a compensation mechanism, the Strategy proposes consideration of associated benefits/responsibilities and of how costs and responsibilities may be most appropriately shared. It is envisioned that resulting policy could help to close animal health gaps between various EU regions and “contribute to preventing major financial risks for Member States and the European Union by providing incentives for prevention of animal related threats” (European Commission, 2007).¹¹

While consideration of how best to achieve a harmonised cost- and responsibility-sharing framework is ongoing, the European Union’s co-financing commitment in the area of livestock disease control and prevention continues to be based on Council Decision 2009/470/EC (25 May 2009) on expenditure in the veterinary field (*Official Journal* L 155, 18/06/2009).¹² This decision sets out provisions for, among other items, emergency measures, a campaign against foot-and-mouth disease, an animal health information policy, and technical and scientific measures. For several livestock diseases, the decision identifies the European Union’s co-financing responsibilities as 50% of the costs which Member States incur through compensation of livestock owners for the slaughter/destruction of animals, animal products and contaminated items (e.g. feed products and equipment). Also included are the cleaning/disinfection of holdings (Paragraph 6 of Article 3).¹³ Additionally, under certain conditions, the European Union will contribute 100% of the supply costs of a vaccine and 50% of the costs of administering it.¹⁴

In order to be eligible for EU co-financing, Member States must fully apply EU rules and, among other actions, immediately isolate livestock holding(s) suspected of being infected. Then, following official confirmation of the disease, they must carry out the slaughter and destruction of susceptible animals (“affected or contaminated or suspected of being affected or contaminated”). They must also ensure the destruction of contaminated feed products and equipment, the cleaning/disinfection of the affected holdings, and the establishment of protection zones. Finally, measures to halt the infection’s spread, a post-slaughter waiting period (prior to restocking), and the “swift and adequate compensation of the livestock farmers” must be implemented (Council Decision 2009/470/EC).

In terms of reporting requirements following a livestock disease outbreak, affected Member States must notify the European Commission and other Member States of the applied control measures and their results.¹⁵ Specific control measures have been adopted by the Council for several diseases, including avian influenza, foot-and-mouth disease, bluetongue, classical swine fever, and Newcastle disease (European Commission, 2011). As a result of these measures, regulations, and reporting requirements, the scale of EU monitoring of Member States’ responses to disease outbreaks is significant.

In addition to prescribing minimum Member State responses to disease outbreaks, EU legislation and regulations act in several ways to limit the potentially negative external trade effects of livestock disease prevention and control measures. First, legislation is “largely based on OIE recommendations/standards and guidelines, respecting (the EU’s) commitments within the framework of the ... SPS Agreement” (European Commission, 2007). Second, while “state aids” can be granted by Member States for losses caused by livestock diseases, specific rules have been established at the EU level to ensure competitive practices and WTO compatibility (European Commission, 2006). Third, concern for trade effects can also be

seen, for example, in the EU's non-vaccination policy with respect to foot-and-mouth disease. This policy dates to 1991 and continues to secure EU producers access to markets that only accept imports from non-vaccinating, foot-and-mouth-free countries (European Commission, 2011).

Although some of the EU policies described above, namely the co-financing mechanism, impact individual Member States' compensation schemes, there is currently no EU-wide compensation scheme or mechanism. Rather, Member States currently maintain their own preferences with regard to the design of compensation programmes. They do integrate EU co-financing into their schemes' finances, but nonetheless a given Member State's compensation scheme could be either purely publicly funded or based on public-private cost-sharing.

North American Free Trade Agreement (NAFTA)

The North American Free Trade Agreement (NAFTA) was signed in 1993 by the governments of Canada, the United States, and Mexico. The agreement plays a role, albeit a small one, in the field of animal health in North America. The NAFTA countries have bilateral arrangements regarding animal health, and some trilateral arrangements such as the North American Animal Health Committee, which was established in 2002 to co-ordinate responses to particular threats, e.g. foot-and-mouth disease. The member nations also interact through the OIE and are part of the larger WTO trading framework and its Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

The main NAFTA co-ordination mechanism for animal health is the Committee on Sanitary and Phytosanitary Measures (SPS Committee). This Committee was created to oversee the application in NAFTA of the SPS measures, which are essentially identical to those in the WTO SPS Agreement (see the WTO section above). The Committee meets periodically and has a mandate under NAFTA to facilitate the enhancement of food safety and sanitary and phytosanitary conditions in the NAFTA countries. It also focuses on the adoption of international standards and the use of equivalence agreements; technical co-operation in the development and enforcement of sanitary and phytosanitary standards; and consultations on specific matters relating to sanitary and phytosanitary measures (NAFTA, 2011). NAFTA also dedicates one of its five technical working groups to animal health.

NAFTA SPS Committee meetings have contributed to improved policy co-ordination and better preparation for responses to crisis situations (Sparling and Caswell, 2006). A relevant example was the tripartite Foreign Animal Disease Response Simulation Exercise in 2000. Following this activity, the countries expressed a commitment to the regular staging of similar exercises. However, despite this effort towards co-ordinated policy and crisis response, substantial progress has not been made towards regulatory integration or co-ordination in animal health policy at the NAFTA level. NAFTA still does not have a relevant centralised office with regulatory powers or one that supervises its technical committees and working groups, nor does it have a specific research facility. Moreover, its budget in this area is particularly limited. Indeed, there is little evidence to show that NAFTA technical committees and working groups were involved in recent key decisions related to the management of livestock diseases, such as the response to bovine spongiform encephalopathy (BSE) outbreaks in 2003 and 2005 that caused substantial market disintegration (Knutson and Ochoa, 2007). Similarly, strategies for detecting and preventing the spread of other well-known livestock diseases such as foot-and-mouth disease and avian influenza have largely remained on an individual-country basis.

Finally, the NAFTA Secretariat holds the role of administering the dispute settlement provisions of the agreement. However, no animal health issues have so far prompted any of the parties to make use of the mechanism (NAFTA, 2011).

MERCOSUR (Southern Common Market)

Mercosur,¹⁶ a free-trade agreement signed in 1991 by Argentina, Brazil, Paraguay, and Uruguay, is now a full customs union that deals with animal health through a number of distinct channels. The main bodies responsible for animal health in Mercosur are the *Comisión de Sanidad Animal* (Animal Health Commission) and the *Comité de Sanidad Animal y Vegetal del Mercosur* (Mercosur Animal and Plant Health Committee).

The Animal Health Commission is the primary element of Working Subgroup 8, “Agriculture”, which is directly subordinated to the *Grupo Mercado Común* (Common Market Group), the executive body of Mercosur that is co-ordinated by the member states’ Ministries of Foreign Affairs. Its main role is to establish import requirements – between member states and from third countries – according to sanitary criteria for different animal species, while also assigning tasks to the Animal and Plant Health Committee.

The Committee has a rotating chair and is mainly charged with administering the provisions of the *Acuerdo Sanitario y Fitosanitario entre los Estados Partes del Mercosur* (Sanitary and Phytosanitary Agreement between Mercosur Member States), which is broadly identical to the WTO SPS Agreement (see the WTO section above). In particular, the Committee is to harmonise the above agreement across member states and with international standards and agreements, facilitate consultations, resolve disputes between members and technical groups, and establish recommendations in relation to sanitary and phytosanitary norms in member states. A third organ, the *Grupo Ad Hoc Sanitario y Fitosanitario* (*Ad Hoc* Sanitary and Phytosanitary Group), also exists to address sanitary and phytosanitary aspects in Mercosur’s external relations with business partners and, with increasing relevance in recent years, with the European Union.

One body that works closely with Mercosur on animal health is the CVP (*Comité Veterinario Permanente del Cono Sur*, or Permanent Veterinary Committee of the Southern Cone). The CVP was created by the *Consejo Agropecuario del Sur* (Southern Agriculture Council) as an independent body to be administered by the national animal health agencies of all Mercosur members, as well as those from Chile and Bolivia. Within this body, the *Comisión de Salud Animal* (Animal Health Commission) makes decisions specific to animal health. It is chaired on a revolving basis by one of the animal health agencies of the Mercosur members, and comprises representatives of FARM (*Federación de Asociaciones Rurales del Mercosur* or Federation of Rural Associations of Mercosur) and PANAFTOSA (*Centro Panamericano de Fiebre Aftosa*, or Panamerican Center for foot and mouth disease, FMD)¹⁷. Three *ad hoc* groups advise the Commission on three specific diseases: FMD, bovine spongiform encephalopathy, and avian influenza.

As an example of how Mercosur cooperates on animal health, in 2005, due to the presence of FMD in member states, Mercosur developed PAMA (*Programa de Acción Mercosur libre de Fiebre Aftosa* or Mercosur Free from FMD Action Programme). PAMA is a regional programme co-ordinated by Mercosur, the CVP, and PANAFTOSA that seeks to eradicate FMD in the Mercosur countries, as well as Bolivia, and contribute to the establishment of a solid system of integrated regional veterinary assistance. PAMA complements the countries’ national programmes, and largely focuses on promoting integration of the official veterinary services in joint actions, especially those conducted in border zones.

Notes

1. This chapter is mainly based on the report “Management of risks from epidemic livestock diseases: Overview of key issues and comparison of compensation and cost-sharing systems in selected countries” prepared for the OECD by a team from Civic Consulting (Germany). This report covered five countries (Australia, Canada, Germany, the Netherlands and Viet Nam) and is also the base for the corresponding sections on compensation schemes in the country chapters of Part II.
2. Non-market merit goods are deemed desirable by society but are not traded in markets. They are associated with positive externalities.
3. The Terrestrial Animal Health Code first appeared in 1968. The Manual of Diagnostic Tests and Vaccines for Terrestrial Animals details internationally agreed disease diagnostic techniques in order to provide a harmonised approach to diagnosis (OIE, 2011c).
4. The OIE’s international mandate to recognise disease and pest-free areas with respect to the SPS Agreement was confirmed by the 1998 agreement with WTO (OIE, 2011a).
5. To date, more than 115 countries have participated in PVS evaluations.
6. Although the term “countries” is used here, a separate customs territory possessing full autonomy in the conduct of its external commercial relations may also become a WTO member, such as the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu (Chinese Taipei).
7. This monitoring is primarily conducted through periodic reports submitted to the WTO between every two years (for the largest economies) and every six years (for smaller economies).
8. This entails sharing responsibilities and co-ordinating activities with major partners such as FAO and OIE.
9. In some cases, this merits joint activity among the animal health and food safety sectors.
10. Notable developments for disease surveillance under the new Animal Health Strategy have included the Task Force on Animal Disease Surveillance (TFADS) and the implementation of an Animal Diseases Information System (ADIS) with OIE compatibility (European Commission, 2011).
11. A study (“Feasibility study on the revision of Council Decision 2009/470/EC (e.g. 90/424/EEC) on expenditure in the veterinary field with a view to develop a harmonised EU framework for cost and responsibility sharing schemes for animal diseases”) commissioned by the European Commission to assess policy modification in this area was recently published (see Bergevoet *et al.*, 2011).
12. Previously, the key act was Council Decision 90/424/EEC (1990), which had been clarified by Commission Regulation (EC) No. 349/2005 setting out additional specific rules on EU co-financing.
13. Article 3 lists 22 diseases (including several aquatic diseases) for which the 50% co-financing of compensation costs applies, including swine vesicular disease, bluetongue, Teschen disease, lumpy skin disease, classical swine fever, African swine fever, and contagious bovine pleuropneumonia. Similarly, 50% co-financing of Member States’ costs resulting from livestock owner compensation is specified for avian influenza in Article 4, while the EU co-financing level for livestock owner compensation for foot-and-mouth disease is set higher, at 60%, by Article 14.
14. Reimbursements paid to Member States from the EU “Veterinary Fund” between 1997 and 2009 totalled EUR 1.1 billion, according to current eligibility criteria. Fully 88% of

the payments were linked to classical swine fever, foot-and-mouth disease, and avian influenza (Bergevoet *et al.*, 2011).

15. More generally, Member States forward information on each applicable disease outbreak to the European Commission through the Animal Disease Notification System (ADNS).
16. Desk research for this section primarily relied on documentation found at the official MERCOSUR website (www.mercosur.int); therefore, unless otherwise noted, the applicable source is MERCOSUR (2011).
17. PANAFTOSA also administers PHEFA (*Programa Hemisférico de Erradicación de Fiebre Aftosa* or Hemispheric Programme for the Eradication of FMD).

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Chapter 2.

Prevention and control systems¹

National systems to prevent and control the spread of animal disease must take into account a number of factors, including the epidemiological history, socio-political culture, and the risks and likely severity of disease outbreaks. The efficiency of these systems is determined by where and by whom decision-making takes place, and how management responsibilities are implemented. In the five countries studied (Australia, Botswana, Brazil, Canada, and France), data for risk assessment is gathered in several ways, with varied levels of information integration and sharing. Major decision-making is generally in the hands of the centralised state Veterinary Services, taking account of the views and interests of stakeholders.

Successful implementation of animal health policy depends on the availability of adequately trained and equipped veterinary field staff and others, along with accepted and transparent roles and co-financing arrangements. The experiences of Australia and Canada offer interesting models of private-public partnerships, while France's GDS system involves all farmers in animal health programmes. Different strategies are possible to organise private contributions through direct fees or levies collected at several steps of the food chain, but governments must assure all partners of their commitment to support some of the initial costs if an important animal disease emerges.

Comparison of the different animal disease prevention and control systems and policies in various countries is not easy because of each country's specificities. These systems and policies are the result of national economic priorities (e.g. maintaining meat exports, financing capacities of the country of the control measures), the epidemiological situation (presence or absence of the diseases in the country, or in the neighbouring countries), the technical control measures available (e.g. vaccination or not, diagnosis tools), and the economic and social acceptance of the disease and the proposed control measures. A deeper analysis of the successes and failures in different animal control plans in each country would be necessary to determine the rationale used in each country for decision-making, and to identify common rules. However, some lessons can be extracted from the analysis carried out for five of the countries (i.e. Australia, Botswana, Brazil, Canada, France) described in more detail in Part II of this document.

The aim of this chapter is not to assess the system of each country observed but to present the specific organisation model developed by each country, and to highlight some specific solutions from an economic or institutional point of view. Some of the organisational choices of these countries could be an example for other countries. The mainly qualitative method adopted for each country first involved a bibliographical search and analysis. Then, phone interviews with experts from the countries and representatives of the Veterinary Services were organised.

The specific organisation of each country was analysed according to the main steps in defining a public veterinary policy, *vis-à-vis* the following three elements.

- Risk assessment (informed by data).
- Decision-making.
- Implementation, including outbreak management.

Evaluation of these components of the overall prevention and control system will help identify greater efficiencies

2.1 Risk assessment

Risk assessment is developed, mainly in the headquarters of the Veterinary Services, to assess the risk of introducing new pathogens into the country. The OIE Code and database constitute a first basis for this analysis, with scientific information on each disease and the description of the sanitary situation in each country. The Code provides a common base for risk analysis used in bilateral or multilateral country discussions.

For internal risk (assessment of the diseases present in the country), the risk assessment is reviewed regularly in each country through specific studies ordered by the agency in charge of the risk management. These studies are usually carried out (i) internally in a specific or non-specific department, (ii) with the support of experts and scientists, and/or (iii) by an independent agency, as in France.

The approach of these studies is more qualitative than quantitative. A qualitative and pragmatic approach can be better than a quantitative risk assessment based on uncertain criteria: most important is to provide to decision-makers relevant information and analysis so that they can understand and justify their decisions to the different stakeholders and to the citizens. Some countries have defined procedures for the risk assessment process; however, it has not been possible to examine the application of these procedures through several significant examples in order to identify how the quality of the scientific approach and the independence of the analysis are ensured. The main findings are presented in Table 2.1.

Table 2.1. Risk assessment: Main findings

Australia	Risk assessment is the mandate of Biosecurity Australia, which defines recommendations to ensure the safety of trade. The results are available on a website and regularly updated with a process to consult the stakeholders. The Food Standards Agency of Australia and New Zealand is involved if there is a food safety risk. Different forms of co-operation with other neighbouring countries are used to anticipate the evolution of the sanitary situation in these countries.
Botswana	Risk analysis is done in the animal disease prevention and control division of the Veterinary Services department, and is mainly based on OIE Code and recommendations. No specific staff are dedicated to risk assessment.
Brazil	A specific internal team of the federal Veterinary Services is created to assess the risk when a new type or new origin of live animals or animal products may be imported. Few risk assessments are done for animal health. However, some rules based on risk assessment have been defined by the <i>Secretaria de Defesa Agropecuária</i> to support the assessment and management of new outbreaks.
Canada	The Canadian Food Inspection Agency (CFIA) is in charge of risk assessment and risk management, but with a specific unit in charge of risk assessment, i.e. the Animal Health Risk Assessment (AHRA) unit of the Science Branch. Canada has defined a <i>Protocol of the Animal Health and Production Division and Animal Health Risk Analysis, Science Advice and Biohazards Division</i>, which is a guide to conduct risk analysis. Normally, this protocol ensures a scientific and independent approach.
France	Risk assessment of products imported into the open European market is carried out by the European Commission's DG Sanco and audited by the EU Food Veterinary Office. For animal health risk in France or in neighbouring countries with an objective risk of introduction (e.g. vectorial diseases), scientific risk assessment is mainly done by an independent agency (<i>Agence Nationale de Sécurité Sanitaire</i>, or ANSES). The main reasons for this organisation are (i) the independence of the scientific opinion delivered by ANSES from the risk manager (<i>Direction Générale de l'Alimentation</i>, or DGAL), (ii) the better methodology of this risk assessment involving relevant scientists and experts with a specialised agency, and (iii) the transparency of the communicated results of the assessment. However, the ANSES mandate is mainly designed for risks to the population (e.g. food safety, zoonoses, environmental threats), and less for specific animal diseases.

Information is a key issue for veterinary services to be able to detect rapidly any outbreak, to update animal health programmes regularly, to supervise the implementation of control measures, and to assess different sanitary policies. In developing countries, the first question is how to secure and to send quickly the information from the field to the headquarters using relevant communication tools. In developed countries, the information exists but is split between different public agencies (public health, veterinary services, customs services, federal-level and local authorities) and between public and private sector (e.g. data from livestock industries). The main problem is how to share this information while respecting the confidentiality of the data, and protecting the specific interests of each partner. For instance, a private industry working on a specific animal health programme to increase its competitiveness has no interest in sharing this information with its competitors.

The most important (and the most difficult) is to define what relevant information must be shared between the partners, and the rules for using these data. In principle, all information should be shared which adds significant added value at national level when shared. At the international level, the OIE notification process and the WAHID database is the consensus on the minimum information that must be internationally shared.

Each studied country tries to gather all relevant information on animal health to carry out risk assessment and to design their animal health programmes. The data often have different origins, coming from different databases developed by different agencies or in different programmes. In each country, there is an ongoing process for achieving better information connectivity and availability (Table 2.2).

Table 2.2. Animal health information systems: Main findings

Australia	Australia has mandated the Animal Health Australia (AHA) partnership (see Table 2.4) to co-ordinate sources of information (animal health programmes, laboratories, farm-level investigations, ...) in a co-ordinated information system (NAHIS). This is probably the most developed information system network among the studied countries.
Botswana	There are three main independent databases concerning livestock. Since the PVS evaluation in 2010, the Veterinary Services have begun to develop some connections between these databases. A significant amount of information is still sent from the field to the headquarters in Word files.
Brazil	The management of animal health information is currently different between the 26 states, and the data are sent on Excel files. However, there is a project to develop a federal database to collect all sanitary information from each federal unit (State or district). The continental <i>Sistema Continental de Vigilancia Epidemiológica</i> (SIVCont) database for all vesicular diseases is an important tool for sharing information between American countries.
Canada	The Canadian Animal Health Surveillance Network shares information from laboratories, and there is co-ordination between this network and the Canadian Network for Public Health Intelligence.
France	The DGAL is building an integrated information system (SIGAL) for all its activities, extending it step by step. This system is connected with the national database for animal identification and movements (BDNI). There is a project to create a platform for sharing information from different origin at regional level.

2.2 Decision-making

Policy is dependent on the sanitary situation and the priorities of a country. FMD eradication and control is very important in the animal health policy of Botswana and Brazil, two countries exporting meat and which have known some FMD outbreaks in recent years. These two countries use zoning to differentiate areas free of FMD and areas with vaccination. They have to combine the different tools (vaccination and slaughtering) in such a way as to preserve their sanitary status and to ensure economic sustainability. Canada and Australia are more focused on the risk of importing emerging diseases that could jeopardise the export potential of their animal products. Due to the better sanitary situation and the efficiency of the rapid detection and rapid responses, their animal health policies are more based on the destruction of contaminated animals. However, this remark must be interpreted taking into account the specific epidemiology of each disease.

If the scientific knowledge on a disease is internationally shared, each country decides on its own strategy to control or eradicate the disease, taking into account national considerations. These considerations include economic priorities (e.g. the importance of livestock production in the national economy), population acceptance of the control measures (e.g. destruction of animals, animal welfare), stakeholder lobbying, and other public policies interacting with animal health policy (human health policy, for instance on antibiotic use, and environmental policy). The decisions are the results of specific relative weights being given to all these factors, which can be difficult to measure (Phylum, 2009). These differences can have a significant impact on international trade, and can be sources of misunderstanding

between trade partners, e.g. as to the impact on the competitiveness of animal production in each country, and whether a decision is a legitimate requirement or a trade barrier.

In all countries, the competent authority concerning the most important diseases (transboundary diseases, zoonoses, diseases with strong impact on animal production) is the central headquarters of the Veterinary Services under the responsibility of the Chief Veterinary Officer (CVO), at federal level for federal countries, and at national level for others. The main remaining question is the sharing of responsibility – mainly for supervision – between the different institutional levels (Table 2.3).

Table 2.3. Decision-making: Main findings

Australia	The federal Veterinary Services are responsible for all transboundary diseases and for co-ordinating the activities of the Australian states and territory governments, who are responsible for animal health matters in their areas. Often the State Veterinary Services are the leading operator, but their procedures (e.g. management of outbreaks) must be validated at federal level.
Botswana	Animal health policy is decided by the central Veterinary Services, as the competent authority. Foot-and-mouth disease is the priority, to protect a FMD-free zone and maintain export levels
Brazil	The federal Veterinary Services define the regulations and guides for the most important diseases and groups of diseases. The federal units (states) have to apply this regulation, adapting it to their own context. The federal unit can develop complementary animal programmes for non-federal diseases. The main focus is the control and eradication programme against FMD. With the eradication of this disease in several states, programmes for other major diseases can be developed.
Canada	CFIA is the competent federal authority on “federal diseases”, i.e. diseases with federal regulation, all the main transboundary diseases. In particular, the CFIA is the leading agency for all issues concerning trade and outbreaks. The provinces are in charge of applying the rules defined by the CFIA; they can decide on some specific programmes for other diseases.
France	For all the most important diseases, animal health policy is decided by the central Veterinary Services, which is the competent authority (<i>Code Rural</i>). Some specific programmes can be developed in some regions, taking into account the specific situation. The control measures decided upon must comply with the EU regulations.

We can identify two main options in the organisation of formal consultation of stakeholders: (i) a forum for each animal sector (e.g. dairy, pig, poultry) with discussion on all economic issues including animal health (Brazil), and (ii) a federal or national inter-professional organisation such as in Australia (AHA) with a committee including representative associations from the different livestock sectors.

The process of consultation undertaken with national stakeholders is often the result of the level of the stakeholders and the culture of the country (Table 2.4). In some very well organised sectors, private partners can drive the decisions. In other sectors, the role of public authorities still prevails.

Table 2.4. Stakeholder consultation: Main findings

Australia	Animal Health Australia (AHA) is a partnership involving the Australian Government, state and territory governments, major livestock industries and other stakeholders, including associations of stakeholders from various animal sectors. It is tasked with involving industry in the management of animal health programmes. AHA is both a tool to involve the private sector in animal health programmes and the main consultation link with the private sector. AHA is involved in the committee (Animal Health Committee) which prepares decision-making.
Botswana	The process for consultation with stakeholders is still non-institutional. However, Botswana is a small country with a small number of significant actors in its livestock sector, and recent outbreaks have shown that consultation exists when it is needed.
Brazil	The process of consultation at federal level exists through different fora specialised in their animal product chain (meat, milk...) and in charge of all issues concerning their development. At State level, consultation exists locally.
Canada	Canada has developed the most elaborated process of consultations with stakeholders, probably the result of a national culture based on transparency and confidence. Consultation is organised through a large number of committees with memoranda of understanding which define the sharing of responsibilities between the different actors. This agreement with all stakeholders is formalised in the National Animal Health Strategy.
France	A large consultation process was organised in 2010 with the <i>Etats Généraux du Sanitaire</i> (EGS). This experience is being used to define the strategy for the next years. The success of this experience will probably improve the consultation process at national level, traditionally more difficult than at the local level.

Table 2.5. Regional co-ordination: Main findings

Australia	Australia involves New Zealand as an observer in the main Australian committees (AHC, PISC, PIMC), due to its nearness and the importance of exchange between the countries. For the risk assessment of food safety, both countries have a common food safety agency. Beyond this bilateral co-operation, Australia is involved in various economic treaties (ASEAN, APEC) and actively develops veterinary co-operation as a way to share information with trading partners.
Botswana	Botswana is a member of the Southern African Development Community (SADC). The meat industry is a major concern in this region, which exports to the European Union and other countries. Thus, livestock and animal health issue is a political priority, both in bilateral discussions and in SADC committees.
Brazil	In the Mercosur, there is a veterinary committee for all veterinary questions. However, bilateral discussions are still important in co-ordinating animal health. The Pan-American Foot-And-Mouth Disease Centre (PANAFTOSA) is an international agency which contributes to the sharing of information and the provision of technical and scientific support. It is also a tool to integrate the animal health policy on the continent.
Canada	The Canada-United States Consultative Committee on Agriculture (CCA) is a bilateral committee to discuss all issues concerning trade of agriculture products, including sanitary questions. There is also a tripartite animal health committee with Canada, the United States and Mexico linked to the Sanitary and Phytosanitary (SPS) provisions of the NAFTA. As much as possible, the CFIA tries to negotiate agreements with trading partners to minimise trade disruptions and the economic consequences of suspected or confirmed disease events.
France	The European Commission plays a major role in co-ordinating animal health policy, with an important regulatory framework to regulate the trade of live animals and animal products, and co-ordinate control plans. Regular meetings of the Standing Committee on the Food Chain and Animal Health (SCFCAH) allow the co-ordination of policy in the EU countries. Disputes in the case of an outbreak in one country are discussed in this Committee. Beyond EU integration, the French Veterinary Services have also developed bilateral contacts with France's trading partners.

The principle of international co-ordination between countries is based on communication between the CVOs. However, the level of integration of the animal health policy differs, depending on the structure and the competency of the regional economic community of countries. The role of the OIE in maintaining common principles is essential in creating confidence between countries.

A common feature is that discussions between countries are mainly between official Veterinary Services, with no direct discussion with foreign stakeholders. The Veterinary Services can provide information on their website about the rules for importing animal products. In some regional economic communities, the livestock industry has developed federations to develop lobbying at continental level.

Until now, economic assessment of government intervention when decisions are required in cases of actual or suspected disease outbreaks is not systematically included in most countries' systems. However, it is becoming more relevant as the values (costs and benefits) involved in market disruptions become larger, and as the necessity to consider the role of incentives in influencing producer behaviour becomes more widely realised.

At regional level, co-ordination depends on the role of the regional economic community in co-ordinating animal health policy, and the importance of livestock in the economy of the region (Table 2.5).

Impact and cost-benefit analyses are being developed in the countries studied. However, taking into account the difficulties of such analyses, this is not being done systematically. In Canada and France, impact analysis is required for any new legislation, and some guidelines on how to implement this analysis are under construction in these countries.

Cost-benefit analyses are often carried out for specific diseases to update an animal health programmes and adapt the relevant control or eradication strategies. However, it has been difficult to assess precisely the importance of such socio-economic analysis in decision-making, and the level of the analyses carried out.

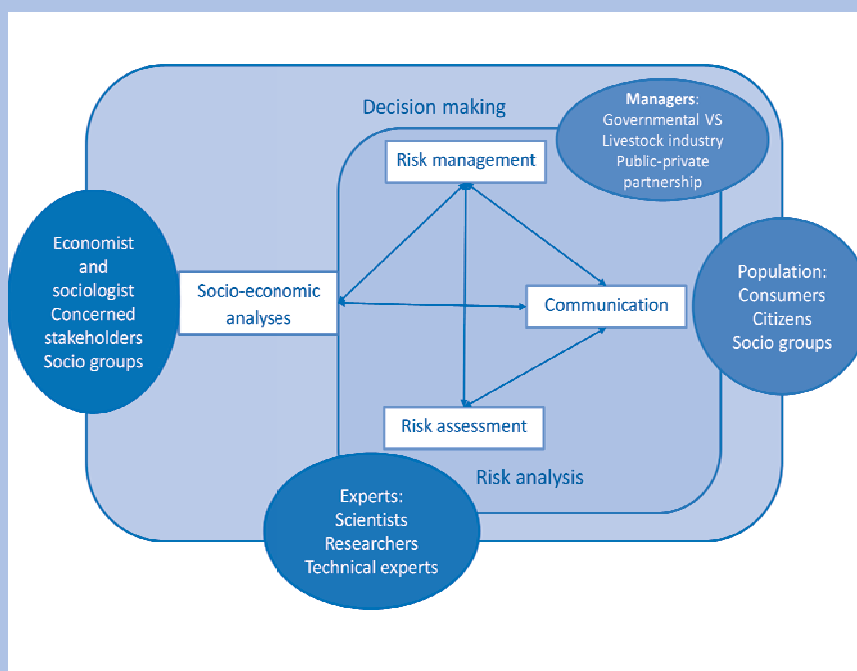
The categorisation of diseases done in Australia (Chapter 4) is an interesting tool for cost-sharing. Such tools avoid discussion between government and industry on cost-sharing when an outbreak happens. The European Union is working on such a categorisation. France (Chapter 8) has created new legislation with three categories of diseases to share responsibility between public authorities and private sector, and to facilitate decision in case of an emergency.

Box 2.1. Risk analysis and socio-economic analysis in decision-making

The risk analysis process is based on three components.

- (i) Risk analysis is the scientific assessment of the risk: what is the risk of disease spread? What are its clinical impacts? What are efficient measures? In order to avoid conflicts of interest, this analysis must be carried out independently of risk management.
- (ii) Risk management is the decision(s) on the control measures to control or eradicate the risk. The risk manager is under pressures from different parties: industries, farmers, consumers...
- (iii) Communication of the risk ensures that the scientific risk assessment is published and available to the public.

In recent years, scientific assessment has been seen as not sufficient for the risk manager. If the decision is based only on scientific risk assessment, managers can be under pressure to take decisions with excessive costs or measures unacceptable to some parties. Socio-economic analysis, ranging from a rapid impact analysis to a precise cost-benefit study, is also an important component for the decision-maker. The objective is to assess the cost of control measures taking into account their technical efficiency to control the disease, and the impact on different socio-economic groups. However, it must be independent from the scientific risk assessment, which identifies a relevant control measure, such as the destruction of suspected contaminated animals. The socio-economic analysis must be able to assess the economic impact and social acceptability of the measure. If the results of the two studies (risk assessment, and socio-economic analysis) are published, the risk manager will be able to decide and justify the chosen control measures, and propose relevant incentives to facilitate the acceptance of the control measures, facilitated by the transparency of the two studies. This independence does not mean that there is no shared information between risk assessors and socio-economists. The mandate of the decision-maker is to co-ordinate the sharing of information and analysis between the two parties for a decision based on a multidisciplinary approach.



Box 2.2. Socio-economic analysis: What tools for which decision?

There is a consensus in countries and in international institutions on recognising the interest of the socio-economic analysis in decision making for risk management. However, practical tools must be developed to facilitate this approach and avoid spending time in fastidious analyses when speed and commonsense must be a priority. To define a good socio-economic approach, it is important to identify the key factors:

- What type of decision is the focus of the socio-economic analysis? It may be a particular technical control measure (e.g. ban animal movements to control the spread of a disease), a new strategy to control a disease, or new sanitary legislation. Across this range, issues, questions and deadlines are not the same.
- Accordingly, the tools used will not be the same: a qualitative impact study if the decision must be taken in a short time, or a cost-benefit analysis to assess different strategies if the issues justify it and the decision time allows it. Beyond a cost-benefit analysis, only the direct impact on the concerned industry may be analysed, or the analysis may be extended to different socio-groups (farmers, industry, consumers, and foreign stakeholders).
- Depending on the scope of the study, the required data will not be the same. Often, the co-operation of the different socio-groups concerned is necessary to collect the needed data. The process of building the cost-benefit analysis is closely linked to the consultation process.

After the first results of the cost-benefit analysis, the process of publication and consultation with stakeholders is important to create a consensus on the analysis.

2.3 Implementation

A field network based on private veterinarians is probably one of the best ways to provide animal health services responding to the needs of farmers, and to ensure the epidemiological surveillance of the territory. The question is more how to provide the relevant human resources in case of outbreaks. With the AusVet company, Australia has prepared a group of private veterinarians able to be involved in official programmes if necessary. Brazil uses staff from State or Federal Veterinary Services.

The organisation of the field network in the countries studied depends on the culture and history of its Veterinary Services (Table 2.6). The cross-country comparison emphasises the importance of the private veterinarian component of disease prevention/mitigation programme effects and the business incentives that make private veterinary practices economically feasible. Those countries with policies that supplant private veterinary services with larger amounts of government cost covering the more routine veterinary procedures (e.g. vaccinations, tests, etc.) have much higher veterinary livestock units (VLUs) per veterinarian.

Official Veterinary Services concentrate their efforts on pre-border and border biosecurity measures to protect the country. In all countries, border security is under the national-level authority, although some tools (quarantine, border posts) can be managed by the state or Province. For biosecurity inside the country, countries such as Botswana and Brazil, which manage different sanitary status zones for FMD, need to strictly control animal movements and to develop check-points to verify that movement rules are respected.

Biosecurity at farm level depends more on the actions of the farmer associations to define and promote good farming practices, with the support of the official Veterinary Services. Under the cross-compliance requirements of the European Union's Common Agricultural Policy, farmers have to follow regulatory biosecurity measures in order to receive European subsidies. This coercion is a complementary tool along with the promotion of a voluntary approach to guide the creation of good farming practices.

Table 2.6. Field networks: Main findings

Australia	Private veterinarians are totally involved in the animal health system, to report any suspicious case on a specific website. They receive incentives to carry out diagnosis tests if necessary. Around 100 of them belong to a task force (AusVet) involved in emergency animal disease response.
Botswana	As a developing country, Botswana has a network is mainly based on official Veterinary Services with paraprofessionals. The private veterinarians are little involved in this organisation.
Brazil	The network is mainly based on a public network with official staff of the livestock veterinary unit for one or several municipalities. However, private veterinarians are also involved in this network, being accredited for specific officially delegated activities (brucellosis sampling, tuberculosis tests, and animal movement permits).
Canada	In each province, every private veterinarian must be accredited through a process to verify their commitments to notify reportable diseases, to manage outbreaks, to respect an ethics code, to maintain their knowledge through training, and to know their role in the network.
France	The network of private veterinarians is still very dense and works with the local official Veterinary Services and the <i>Groupements de Défense Sanitaire</i> (associations of farmers specialised in animal health) in the implementation of animal health programmes. They have a “sanitary mandate” – an agreement defined in the legislation (<i>Code Rural</i>) with the Veterinary Services to carry out some official activities.

Cost-sharing is a key issue and tool in animal health policy, and concerns both animal health control plans decided by public authorities (the top-down approach) or animal health control plans proposed by stakeholders (a bottom-up approach). During this study, it was not possible to assess precisely the respective contribution of the federal government (in a federal country), the states and local authorities, and the private stakeholders, but a number of principles have been developed (Box 2.3).

Box 2.3. Principles of cost-sharing

1. Ensure good implementation of the control measures. For an eradication programme, the compensation must be correct (relevant estimation of the price of the destroyed animals) and quick to avoid farm bankruptcy while waiting for compensation.

- As was seen in some countries during the avian flu crisis, farmers preferred to see their animals killed and to receive governmental compensation rather than to sell them on the market, because the compensation was too high. On the other hand, if the compensation is too low, they will not report the disease.

- Often, the governmental compensation is a guarantee of being paid. However, some sectors contract private insurance in order to be compensated more quickly.

2. Increase the responsibility of the farmers and of the industry in the management of the animal health programmes. A direct contribution from them motivates improvement in the efficiency of the programmes.

3. Generalise the incentives of the animal health programme. The cost supported by farmers must be compatible with the importance of the programme as they perceive it. This perception is a combination of their direct economic interest and their perception of the interest for the sector (e.g. including the processing industry) or society as a whole (e.g. a public health issue). This is why awareness campaigns are very important to increase the interest of farmers in these measures. The question for the public contributor is: how much needs to be paid by the state in order to optimise the contribution of the private sector?

4. See the collective interest as the protection of a common good (protection of public health, protection of disease-free zones by limiting disease spread). Public support should not be a way to support an economic sector or to compensate repeated individual or collective mistakes. In the European Union, this is a major issue for the new animal health legislation defining the rules for authorizing public support for animal health programmes.

Beyond the question of cost-sharing, there is the question of how to collect the private contributions. At least two methods are found:

- Service fees, as in Brazil where FMD vaccination is paid by farmers, or in France where the fees are collected by the GDS. The direct cost-benefit of the provided service will be important in ensuring the satisfactory application of the measures.
- Levies not paid directly by the farmers but collected on per-animal transactions, permit movements, etc. If levies are on permit movements or vaccinations, the cost falls on the farmers. If levies are on transactions or in slaughterhouses, the cost is placed on the whole food chain.

The question of financing animal health programmes is not only a question of cost-sharing, but also (perhaps more) of defining the best strategy for the financing and the efficiency of the programmes. In each country studied, costs are shared between the private and public sectors (Table 2.7). It is difficult to draw comparisons without precise analysis, because the situation can be different from one disease to another, and from one state to another in the same federal country.

Table 2.7. Cost-sharing: Main findings

Australia	Cost-sharing depends on the categorisation of the diseases. The contribution of the private sector is based on levies collected on animal transactions which allow for reimbursing the cost of emergency responses or animal health programmes. This system is the result of a strong consensus between official Veterinary Services and the animal product industry.
Botswana	A large part of the service provided by the official Veterinary Services is free of charge for farmers. FMD vaccination (vaccines and actions) are free of charge. For some other vaccination campaigns, farmers pay only for the vaccine. Compensation for slaughtered animals depends on the government's financing capacity, which can be rapidly limited in the case of a major outbreak.
Brazil	Compensation for slaughtered animals for eradication of FMD is good, with a sharing of the cost between the federal government, the state and the private sector; but FMD vaccination is paid by the farmers. A system of levies collected on services such as delivering movement permits, or on the production of vaccines by some foundations, finances the private contribution.
Canada	Samplings and testing are publicly funded for federal animal disease programmes. Vaccinations are charged to the farmers. Compensation is paid by the federal government to avoid compromising the budget of the CFIA, but depends on the biosecurity risk for the country. In some sectors, industry has arranged private insurance, on a clearly defined basis, to ensure rapid compensation before the compensation by the government.
France	Cost-sharing is organised through the GDS, which collects fees from farmers to carry out their activities following different strategies. Compensation for animals slaughtered for eradication programmes are mainly paid by the government. Some vaccinations have been paid by the government. However, the surveillance campaigns for brucellosis and tuberculosis are mainly paid by farmers.

2.4 Management of outbreaks

In all the countries studied, the management of an outbreak is led by official Veterinary Services (Table 2.8). In federal countries, it can be by the federal level (Canada, Brazil) when the suspicion is confirmed, or by the state Veterinary Services under the supervision of the federal Veterinary Services.

Experiences with outbreaks over the years have emphasised the importance of speed in taking action to counter disease spread by imposing movement control or other measures, and in informing the general public about the existence of the disease and appropriate prevention

measures. Incentives for delay include uncertainty, and the desirability of consultation and thorough analysis, but the consequences can be severe, and a highly precautionary approach seems justified. A further area where slowness may undermine efforts to prevent and control animal disease is in compensating losers (Chapter 3); widespread reliance on speedy resolution of claim payments is important in building confidence in disease management systems.

Table 2.8. Outbreak management: Main findings

Australia	Each state has to define its Emergency Animal Disease (EAD) Response Plan, which is validated at the federal level. The plans define the roles of each actor and the standard operating procedures to be applied. The AHA plays an important role in co-ordinating the preparation of these plans and in proposing guidelines.
Botswana	Botswana Veterinary Services have mainly developed procedures for emergency response in case of FMD outbreaks, with a specific team able to go on site to manage the situation and co-ordinate measures.
Brazil	Federal Veterinary Services have defined procedures for emergency response in the case of FMD outbreaks. Responsibility is shared between State level and federal level. If needed, the federal level can provide supplementary means.
Canada	The emergency plans are defined by the CFIA in co-ordination with Provincial Veterinary Services. The CFIA leads the emergency plan response.
France	In case of an outbreak, the emergency plan is led by the local Veterinary Services. A national unit can give specific support. Locally, the measures are implemented with the support of private veterinarians and the GDS.

2.5 Supervision of animal health policies

In the supervision process, we can distinguish two approaches:

- The assessment of animal health programmes or emergency response plans to verify their efficiency
- The evaluation of the organisation of local or state Veterinary Services according to standards defined in the country to verify that the different services are in compliance.

Each country has its own supervision procedures. These are probably less developed in Botswana, but this country is regularly audited by the agencies of the importing countries (the Food Veterinary Office (FVO) for the European Union). France is also audited by the FVO to verify the implementation of the EU regulations; however, regular audits are organised to assess services and animal health policies, and moreover the relevant authority (the DGAL) is accredited according to the ISO 17020 standard. In Canada, the CFIA carries out regular audits of programmes and institutions. Australia has defined specific standards to assess animal health programmes, and Brazil is preparing such standards to assess state Veterinary Services using the experience of the PVS evaluation from OIE.

2.6 Conclusions

Even though models are different between the countries studied, the same principles guide the organisation of the Veterinary Services for the prevention and control of livestock disease. This is largely due to the important work done by the OIE to define standards for Veterinary Services in its International Code, and to promote these standards.

However, the organisation of the animal health system in each country is the consequence of the following.

- *The historic epidemiological situation.* The system in Canada and in Australia is mainly driven by concerns over the risk of introducing new pathogens into the country, due to recent events (avian flu in Canada, equine influenza in Australia). The organisation in Brazil and Botswana is still driven by the risk of FMD.
- *Political organisation*, i.e. federalism or a centralised nation.
- *Economic issues*, i.e. the importance of animal production in the country and the volumes of exports and imports of live animals and animal products. Exporting animal products is a big issue for all these countries. However, the capacity of Botswana and Brazil to export meat depends on their capacity to maintain their sanitary status with disease-free zones.
- *The culture of the country*, which is important in the relationships developed with the private sector to share the same vision of the animal health strategy and the cost sharing.

From this analysis of the animal health systems in the selected countries, it is possible to identify some key factors:

- *Animal health policy is an inter-professional issue.* Even though the animal health policy is driven by the official Veterinary Services, farmers, animal product industries and veterinarians must be involved in the definition and the implementation of the animal health policy. The example of AHA in Australia is an interesting private-public partnership with a strong consensus on the management of the different kinds of diseases.
- *A clear chain of command with strong co-ordination and precise sharing of responsibilities* between the different private and public institutions, local and national authorities. This also means precise procedures for the efficient management of emergencies, as well as control or eradication programmes. Coordination by one agency with a high level of information-sharing is essential. The culture and the experience of Canada is an interesting model involving all partners under the supervision of one agency, the CFIA.
- *Information, training and communication are important in making all actors aware of animal health issues*, and especially farmers. The work done locally by the GDS in France involves all farmers in the animal health programmes. In Canada, the continuing education campaigns and the tools provided for private veterinarians and their accreditation is a way to maintain competencies at field level.
- *Cost-sharing of animal health policy between private partners (farmers, food industry) and public authorities* is needed to maintain the economic interest of the livestock sector in animal health policy. Different strategies are possible for organizing private contributions through direct fees or levies collected at several steps of the food chain. Most important is to define the best strategy to optimise the financing and the efficiency of the programmes.

Finally, regardless of the cost-sharing arrangement, the government must assure all partners of its commitment to support the costs of measures if there is an important emerging animal disease, at least in first instance. This allows decisions about immediate control measures without long discussion on their financing. In Canada, compensations are paid by the federal government to avoid constraints on the budget of the CFIA. In Australia, the government will first pay the control measures, and the private sector will reimburse its share afterwards according to a scheme defined in the categorisation of the diseases.

These key factors concern both infrastructure investment (e.g. identification and certification) and “variable” costs. The balance on the involvement of private partners and

public partners can be different, [depending on](#) disease categorisation. Some diseases, such as production diseases, mainly concern the private sector. For other diseases, the involvement of public sector can be justified for different reasons: (i) to protect public health in case of zoonoses, (ii) to facilitate the implementation of efficient policy by all concerned partners of the livestock sector to control or eradicate major contagious diseases, and (iii) to maintain the animal health status which is internationally recognised as a public good.

Note

1. This chapter is mainly based on the report “Management of risks from epidemic livestock diseases: Review and comparison of Prevention and Control systems in selected countries”, prepared by a team from Phylum Consulting (France) led by Francois Gary, and Mathilde Saulnier. It covers five countries: Australia, Botswana, Brazil, Canada and France.

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Chapter 3.

Compensation schemes¹

Compensation schemes for animal disease losses provide incentives for individual and aggregate good-practice biosecurity, and provide an income safety net for livestock keepers. However, such schemes can be costly, and involve “moral hazard” if not carefully administered. The five country compensation schemes examined in this chapter (Australia, Canada, Germany, the Netherlands and Viet Nam) share several key features, such as timely reporting requirements to avoid paying penalties, reliance on market value (or a percentage of it) as the basis for assessing indemnification for loss of animals, and not compensating consequential losses. Cost-sharing arrangements, however, diverge: the Australian and German governments always pay a portion of outbreak control costs, while in the Netherlands these costs are covered entirely by the livestock industry up to the negotiated contribution ceilings. Publicly-funded schemes also differ: the Canadian compensation scheme is entirely funded by the federal budget, while in Viet Nam both the central government and provincial funds participate.

Contribution amounts vary, with Australia’s probably providing the highest effective level of compensation, and Viet Nam, with a compensation rate of 70% of market value, the lowest observed rate. There would appear to be considerable scope for variants of animal disease compensation schemes, tailored to specific industry/disease situations, which can both reward and promote good disease risk management practices, and appropriately share costs across producers and between producers and government.

This chapter synthesises the findings from analyses of the public and public-private cost-sharing compensation schemes implemented in five studied countries (Part II): Australia, Canada, Germany, the Netherlands, and Viet Nam. It analyses compensation schemes by looking at institutional frameworks, compensation practices, financial structures and incentives.

There are a number of advantages and disadvantages to compensation in the case of animal disease events. Specifically, compensation:

- encourages (early) reporting of infectious disease;
- encourages the co-operation of animal keepers at times of national disease threat (e.g. in relation to co-ordinated disease control measures);
- provides a safety net to animal keepers to avoid catastrophic loss;
- reduces risk (for individual keepers) and uncertainty which may hamper business decisions (this assumes a given compensation scheme is properly implemented before an outbreak);² and
- can encourage good practice with respect to disease risk management.

On the other hand, compensation:

- can be costly;
- requires resources to be expended on administration, etc.;
- can cause “moral hazard” and encourage risk-taking behaviour (i.e. in the knowledge that a large element of the financial cost associated with the risk will be paid by someone else, e.g. government);
- can cause market distortions (e.g. effects on competitiveness);
- can be difficult to set compensation payments at the right level. If payments are not set at an appropriate level, unintended consequences may result from adverse/perverse behaviour. (For example, where compensation payments are set too high, animal keepers may fail to practise appropriate disease risk management because they would make more money from compensation if their livestock became infected and were compulsorily slaughtered than they would selling them through the market. Alternatively, where compensation payments are set too low, animal keepers may not be sufficiently incentivised to report disease at an early stage, or to co-operate with disease control measures more generally); and
- may carry potential for manipulation/abuse (i.e. claiming higher compensation than is warranted, e.g. for high-value “pedigree” stock).

In order to reduce the above disadvantages of an animal disease compensation scheme, a number of measures may be taken. Some of these measures are similar to those adopted by insurers, who face similar problems (Civic Consulting, 2007).

- The cost of compensation and administration is paid (prospectively) in the form of an annual payment (akin to an insurance premium) by those eligible to claim payments for loss. The annual payment can cover the full cost of the compensation scheme or be a shared cost with government or others (hereafter referred to as a cost-sharing scheme). Annual payments might mitigate the potential disadvantages of compensation payments in several ways, including: 1) help to better spread costs over time; 2) lead to the

creation of a fund comprising excess revenue which can be used for disease prevention or similar activities during “peace-time”; 3) engender and demonstrate livestock holders’ “ownership” and participation in a compensation scheme; and 4) help to incentivise good practice in combination with the next two points.

- The annual payment to the scheme may be scaled according to individual risk (i.e. penalising those posing high risk).
- Annual payments to the scheme may be reduced for good practice (i.e. which reduces risk). These payments can form some or all of the payment shown by V2-V1 in Figure 1.3 above.
- Claimants may pay some of the compensation being claimed from the scheme (e.g. the first dollar – a “deductible” or “excess” in insurance terminology) which is a disincentive to risk-taking.
- Claims (i.e. compensation payments) may be invalid/not payable or reduced if certain conditions are not met (e.g. prescribed protective measures not taken, corresponding with R2 in Figure 1.3 above, failure in early reporting, premium not paid, etc.). Cross-compliance may be required in relation to other farm payments.
- Claims may be assessed and adjusted accordingly (although this adds to administration costs).
- (Legal) action may be taken in cases of abuse/fraud.
- Where private insurance exists, it should be widely available within a competitive market (thus reducing premia, providing choice in insurance products, etc.). However, private insurance coverage for epidemic disease is available in only a very few markets.

In the case of an infectious animal disease, it is usually not feasible for third-party costs (i.e. disease losses experienced by other animal keepers due to disease spread from an original source) to be covered by an individual’s membership of a scheme, or indeed by private insurance. Thus, all animal keepers need to be covered by a compensation scheme to cover such costs. Compensation can cover animal deaths and some emergency disease control measures (e.g. vaccination, treatment, etc.) and, in principle, other “business losses” (although the latter can be difficult to define and are often restricted to specific categories of loss). Consequential losses can stem from business interruption (e.g. buildings must be dedicated to stamping-out efforts); movement restriction zones (i.e. animals cannot be moved from the property – sometimes in these cases “welfare” slaughter is carried out); repopulation costs in excess of animal costs; emergency vaccination campaigns (because products from vaccinated animals are worth less); or general price declines. Globally, compensation schemes do not usually indemnify consequential losses (World Bank *et al.*, 2006). Routine disease control measures may not be payable as compensation, but may affect compensation payments for certain categories of loss or affect the level of contributions to the scheme (e.g. testing or vaccination may be at the individual animal keeper’s cost, but may be a requirement for cover or may reduce individuals’ contributions).

Compensation systems exist in different forms in many EU member states, as well as other countries, sometimes also involving private insurance. These include: (i) public schemes that are fully financed by the government (e.g. Canada); (ii) public schemes that are partly financed by livestock keepers/stakeholders (e.g. Germany, Netherlands, Australia); (iii) publicly supported schemes that involve private insurers (e.g. Spain); and (iv) private schemes that complement government compensation (e.g. the United Kingdom, the Netherlands, and France). Private farm insurance against certain risks can be voluntary or mandatory, and may, in part at least, be subsidised by government (i.e. subsidised premiums).

Private insurance may cover some losses, and government and/or industry compensation scheme funds may cover others. Farmers may be required to have private insurance to be eligible for government compensation.

In addition to government schemes, there are a number of successful examples of producers coming together to tackle a disease via compensation payments to affected producers paid for by the industry itself. For example, in Great Britain, Aujeszky's disease in pigs was eradicated as a result of such an initiative funded by a levy of pig producers (collected by the then Meat and Livestock Commission under the Pig Industry Levy Act) with compensation paid to affected pig producers to cover the market value of animals slaughtered.

A number of countries have public/private partnership cost-sharing schemes that aim to share both responsibilities and costs in relation to epidemic livestock disease. These schemes are very diverse, and often vary greatly from one country to another or even from one area of a country to another, reflecting different needs, cultures, etc. However, the two main objectives of each of these schemes are to: (i) achieve an appropriate and fair balance of costs associated with disease and its control along the food supply chain (but particularly between livestock producers and government); and (ii) better manage disease risks, improve animal health and welfare (e.g. through appropriate incentives to good practice) and reduce the total costs associated with disease and its control.

A number of principles can be applied when considering how costs should be shared between stakeholders. Probably the main ones are (i) polluter pays (i.e. those who create the risk or contribute to the magnitude of the impact by their activities pay accordingly) and (ii) those who benefit most, pay most (i.e. costs are shared according to who gains and who loses from disease and disease control), but there are others including "those pay who can afford it." The choice of principle is partly an ethical one, although economics may be able to provide guidance as to which is likely to most efficiently achieve the desired objectives and which is likely to be most cost-effective at doing so.

Although the polluter-pays principle is a widely accepted one, especially in the context of negative environmental externalities, it may not be easy, in an animal disease (negative externality) context, to obtain either evidence or consensus on who the polluters are and what their liability is. Moreover, disease "polluters", certainly as individuals, may not have the financial ability to pay for the impacts of their actions (for example, where epidemic disease is proven to have been introduced or spread by a single producer and to have resulted in very large damages costing millions of dollars).³ For this reason, it is more practical to consider risk creation as attributed collectively to an entire industry (e.g. all livestock keepers) or industry sectors (e.g. pig, poultry, cattle producers). In terms of providing incentive for livestock producers to better manage disease risks by making "risk creators" pay, it may be difficult to accurately define the risks involved (in terms of probability and outcome estimates). However, some basic algorithms (such as membership of an appropriate farm accreditation/assurance scheme) could be used to appropriately reward and penalise good and bad disease risk management practices respectively.

The principle of sharing costs according to who gains (or loses) may be complicated to apply because the magnitude and distribution of benefits and costs of disease will depend on the precise nature of the disease incident. This makes generic rules for cost-sharing difficult to specify – although in some countries such as Australia, industry and government have agreed specific proportional cost shares associated with specific diseases. Moreover, since costs and benefits may be shared along the food supply chain, and external to it, there is an issue as to who should be included in cost-sharing – should it be just government and livestock keepers or does the principle extend to others such as food manufacturers, food retailers, or consumers? However, in practical terms this may prove difficult to administer, and, anyway,

as a result of the market system, both the costs and benefits of disease and its control will be distributed along the supply chain through market prices and product quantities.

A general principle might be that where livestock producers (or a subset of them such as according to species or production system) are the primary beneficiaries of policy (e.g. a production disease that has no implications for human health, food safety, etc.), then these producers should pay the greater share. However, where wider benefits accrue to others in society, for example in terms of reduced risks to human health, benefits to the environment, benefits to animal welfare etc., then government, on behalf of wider society, might pay relatively more. For example, the Animal Health Australia industry-government partnership shares the costs of responding to emergency animal diseases (EADs) according to an EAD categorisation system determined by the impact an EAD can have on livestock industry production, human health and the environment (see the Australian case study in Chapter 4).

3.1 Institutional frameworks

There appears to be considerable scope for the tailoring of compensation schemes to specific country and risk contexts, with the result that several differently designed schemes might all be able to efficiently promote good risk management practices and incentivise early reporting and co-operation with control measures. Given that this study examined five compensation schemes on four continents, there are, unsurprisingly, some scheme design differences in the following comparative tables. Nonetheless, it is notable that, in many respects, the tables show substantial similarity in the inclusion and utilisation of key compensation scheme aspects and practices. Table 3.1 provides the names and legal bases of the compensation schemes in the five countries studied.

Table 3.2 offers policy context through its depiction of the relative availability of complementary private insurance for epidemic livestock disease risks in the five countries. Whereas in Australia, Germany, and the Netherlands, the implemented schemes are public-private in nature, the Canadian and Viet Nam compensation schemes are purely public. With respect to funding, cost-sharing is clearly used in three cases and public funding in the other two. Additionally, there is the issue of stakeholder involvement in scheme-related decision-making. The three cost-sharing schemes institutionalise this public-private collaboration. In Australia, the EADRA, which constitutes the legal basis for the compensation scheme, is an agreement between Australian governments (Commonwealth and state/territory), the livestock industry, and Animal Health Australia (AHA), the public company that serves as custodian of the EADRA and is itself a public-private partnership. In Germany, livestock holders are represented on the governing boards of the *Tierseuchenkassen*. In the Netherlands, private-sector contribution ceilings for outbreak response costs are formally negotiated every five years between three industry Product Boards and the government.

Table 3.1. Compensation scheme names and legal foundations

Name of scheme		Legal basis
Australia	Emergency Animal Disease Response Agreement (EADRA)	Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (2002)
Canada	Canadian Food Inspection Agency (CFIA) compensation	Health of Animals Act; maximum compensation amounts are set out in the <i>Compensation for Destroyed Animals Regulations</i>
Germany	<i>Tierseuchenkassen</i> (Animal Disease Funds)	<i>Tierseuchengesetz</i> (Animal Disease Act, revised version of 2004) and applicable federal state (<i>Bundesland</i>) laws
Netherlands	Animal Health Fund	The Animal Health and Welfare Act (<i>Gezondheids- en welzijnswet voor dieren</i>); and the agreements between the government and industry-sector-representing Product Boards (<i>Convenant financiering bestrijding besmettelijke dierziekten LNV – PVV – PPE – PZ</i>)
Viet Nam	Emergency support policies, including compensation, for disease prevention and control	Based on a series of government decisions dating from 2004; the most recent is Government Decision No. 1442/QĐ-TTg (August 2011)

Source: Civic Consulting (2011).

Table 3.2. Institutional frameworks

	Scheme governance			Main stakeholders
	Overview	Type	Formal industry representation in decision-making	
Australia	Animal Health Australia (AHA) acts as custodian of the EADRA. Following an outbreak, it collects data on the response and processes cost-sharing claims. The National Management Group invokes the EADRA via approval of a post-incident disease response plan. The more technical Consultative Committee on Emergency Animal Diseases informs the National Management Group's decisions.	Public-private cost-sharing	✓	- Animal Health Australia (AHA); - Commonwealth Government; - State/territory governments; 14 industry organisations; and, comprising representatives of the EADRA signatories just listed, - National Management Group; - Consultative Committee on Emergency Animal Diseases
Canada	Administered by the Canadian Food Inspection Agency (CFIA), which reports to Agriculture and Agri-Food Canada minister. CFIA district veterinarians issue animal/property destruction orders upon determining a disease presence. Compensation evaluator(s) are then charged with calculating the market value.	Public	*	- Agriculture and Agri-Food Canada; - Canadian Food Inspection Agency and district veterinarians; - Livestock holders (including national supply-managed representative associations)

	Scheme governance			Main stakeholders
	Overview	Type	Formal industry representation in decision-making	
Germany	<i>Tierseuchenkassen</i> are administered by federal states (<i>Bundesländer</i>) and have governing boards comprising members chosen by farmers, state agriculture ministries, county veterinary authorities, and agriculture organisations.	Public-private cost-sharing	✓	• <i>Tierseuchenkassen</i>; • Federal states; • Agriculture organisations; • Livestock holders; • Veterinary officials
Netherlands	The compensation scheme functions through the Animal Health Fund, a public-private partnership funded through five-year agreements between the government and three Product Boards. The Ministry is responsible for daily administration of the Fund and for preparing prevention and control policies for the relevant livestock diseases.	Public-private cost-sharing	✓	• Ministry of Economic Affairs, Agriculture and Innovation (previously, the Ministry of Agriculture, Nature and Food Quality (LNV)); • Product Boards for Livestock and Meat, Poultry and Eggs, and Dairy; • Livestock holders
Viet Nam	Central government regulates the scheme through decisions of the prime minister upon request of the Ministry of Finance and in collaboration with the Ministry of Agriculture and Rural Development. Provincial finance departments manage funds within their respective provinces. Committees for disease control and prevention at provincial and district levels work with commune committees to confirm disease presence and develop culling documents/appraisal forms which serve as the basis for compensation payments.	Public	**	• Central government (Ministry of Finance, Ministry of Agriculture and Rural Development); • Provincial departments of finance; • Provincial and district committees for disease control and prevention; • Commune committees (including sampling of affected farmers); • State-owned enterprises (compensation procedures differ)

* Co-operation with associations representing the livestock industry appears routine, especially regarding modifications of the *Compensation for Destroyed Animals Regulations*, which set maximum compensation amounts (see, for example, Ritz (2011)).

** At the commune level, livestock holders participate via representation (a sample of affected farmers) on the commune committees that are tasked with disease control. Overall, however, the key decision-maker is the government.

Source: Civic Consulting (2011).

There is inherent value in using, as is clearly done in Australia, Germany and the Netherlands, such consultative processes for the management of disease control and compensation practices, “because a scheme that is designed to take account of the priorities of different actors is more likely to encourage compliance with disease control” (World Bank *et al.*, 2006). While private-sector participation in compensation scheme administration does not appear to be formalised to the same extent in Canada (where the Health of Animals Act prescribes government administration of the compensation scheme), discussions are reported to occur frequently between the Canadian Food Inspection Agency and associate bodies representing the livestock industry. Such dialogue appears especially common to decisions that affect scheme operation, e.g. modifications to the schedule of maximum compensation amounts. The key decision-maker within Viet Nam’s compensation programme is also the government. However, the existence and role of the commune committees on disease control

is notable, as they generally comprise a commune leader, a lawyer, an animal health worker, a sample of affected farmers, a police officer, and other local personnel.

Among the five countries, complementary private insurance for risks related to epidemic livestock diseases (independent from the coverage of the compensation scheme) is only widely available in Germany, where it can be purchased to cover an array of livestock risks, including production/business interruption losses from sales interruptions. Some relevant insurance products are also purchasable in Canada (mostly in the poultry sector); most livestock holders still rely on public risk management programmes. In the Netherlands, private insurance for certain disease-related risks is available, but the uptake rate among livestock holders is below 10% and the coverage is more limited than in neighbouring Germany.⁴ In Australia, private insurance for livestock disease risks is not widely held by livestock owners; few “off-the-shelf” products are available. In Viet Nam, private insurance has not yet been introduced, though a relevant pilot project is underway.

3.2 Compensation practices

As shown in Table 3.3, the scope of compensation available to livestock holders in the five countries is largely similar. Effectively, the compensation schemes indemnify direct losses resulting from destroyed or slaughtered livestock and, in most cases, related products that are destroyed (e.g. animal products or feed). Additionally, compensation is generally available for animal destruction/disposal costs.

Extension of compensation coverage to small industries and smallholders/non-commercial farmers is practised in Australia (industries with gross value of production below AUD 20 million need not be represented by an EADRA signatory to be compensation-eligible), in Canada (compensation is payable for any animal ordered to be destroyed under the Health of Animals Act), in Germany, and in the Netherlands, where the government pays the full cost of indemnifying smallholders for their direct losses. Past decisions on eligibility in Viet Nam have differed by province, sometimes establishing minimum flock/herd populations as a determinant of compensation eligibility.

None of the selected compensation schemes provides compensation for consequential losses incurred by livestock holders as a result of an outbreak and subsequent control measures. Non-coverage of consequential losses is explicitly stated in the Australian EADRA; the compensation scheme administered by the Canadian Food Inspection Agency only covers destroyed animals/items and disposal costs; in Germany, consequential losses are a matter for private insurance; the Dutch government has historically held the principle that such losses are a private-sector responsibility; and Viet Nam only indemnifies culled animals. However, interviews conducted for this report suggest that stakeholders in Canada, the Netherlands, and Germany have discussed potential policy responses to the consequential losses that result from disease control measures such as movement restriction zones or emergency vaccination programmes.

More specifically, consideration has been given in Canada to extending AgriInsurance, the subsidised crop loss programme, to livestock risks. In Germany, stakeholders considered coverage of consequential losses before concluding that the preferred approach constitutes limiting the extent and duration of movement restrictions through readiness and rapid action in the event of a disease outbreak. The Dutch government is engaging the livestock industry in formalised discussions on the potential development of a compensation or insurance scheme to address certain types of consequential losses. The Australian approach also attempts to limit the extent of this issue by ensuring that the tools and procedures required for quick response plan implementation, and thereby a decrease in the duration and scope of consequential loss-provoking control measures, are in place *ex ante*.

Table 3.3. Compensation practices: The scopes of coverage

	Overview of coverage	Small-holders eligible?	Compensation for consequential losses	Notes
Australia	Payable for destroyed livestock and property and for dead animals that would have been destroyed.	*	Not provided	No allowance made for loss of profit, loss from breach of contract, production loss, or any other consequential loss.
Canada	Covers three loss types: destroyed animals; destroyed items (e.g. animal products); and animal disposal costs.	✓	Not provided**	Only indemnifies direct losses from control measures. However, extension of the AgriInsurance programme to cover production losses is under consideration, and a policy for dairy mortality and related business interruption is functioning in one Province.
Germany	Direct losses from officially ordered culling, including animal value and culling/disposal costs.	✓	Not provided	The cost-sharing scheme covers only direct losses, but private insurance coverage for consequential losses is widely available.
Netherlands	Direct losses from control measures, including culled animals and destroyed products, as well as laboratory fees, animal transportation costs, and disinfection expenses.	✓	Not provided	Government principle holds that consequential losses are a private sector responsibility. However, the ministry is assisting in developing a potential scheme for consequential losses which would likely be managed by the private sector.
Viet Nam	A percentage (currently 70%) of the market value of culled animals is payable to livestock owners. Per-animal or per-day subsidies are also provided to officials who vaccinate or cull animals.	***	Not provided	Only direct losses are eligible for compensation.

* Livestock holders in industries with gross value of production less than AUD 20 million are eligible for compensation, even if the industry is not represented by an EADRA signatory.

** The compensation scheme administered by the Canadian Food Inspection Agency does not cover consequential losses; however, depending on the context of a livestock disease outbreak, the Business Risk Management suite of programmes managed by Agriculture and Agri-Food Canada might cover some consequential losses. Certainly, the government (matching) contribution to AgriInvest savings accounts could be used by livestock holders to offset a portion of business interruption losses; AgriStability would issue pay-outs if the outbreak led to a whole-farm 15% margin decline, and the AgriRecovery framework might be activated.

*** In the past, decisions on eligibility have varied by province. For example, whereas Ha Tay Province once decided to compensate all farmers, Ho Chi Minh and Tien Giang Provinces required poultry producers to have more than 100 and 50 animals, respectively.

Source: Civic Consulting (2011).

The methodologies employed by the schemes to determine actual compensation levels do differ in some respects (Table 3.4) though the assessment mechanisms are notably all based on the market value of animals and products, and in this manner are substantially similar.⁵ In the four OECD member countries scrutinised, assessors aim to derive market value or, as described in the EADRA, the farm-gate sale value, based on characteristics that might include such factors as animal category, age, purchase price, and production history. The Canadian compensation scheme and the German *Tierseuchenkassen* are unique in that they set out specific maximum compensation amounts per animal type, e.g. in Canada compensation for registered cattle cannot exceed CAD 8 000 per head, while in Germany the limit is EUR 3 068 per cow. Notably, different provisions are sometimes made for assessment of market value in cases where a functioning market for the animal in question does not exist. For example, in such cases Canada utilises an economic formula – and what has been termed the “cost-of-production approach” (World Bank *et al.*, 2006) – that takes into account the life-cycle phase attained by animals and associated “grow-out” costs. The German *Tierseuchenkassen* can meanwhile rely on EU funds for buying animals out of the market in the event that regional markets collapse following an outbreak.

Table 3.4. Compensation practices: Valuation methodologies and conditionality

	Determination of compensation amounts				Attached conditionality
	Market value-based?	Valuation rules	Date of assessment	Owner can appeal?	
Australia	✓	Value of destroyed and dead-from-the-disease animals assessed on basis of a farm-gate sale price. When applicable, a second, top-up payment compensates for the difference between the market value of equivalent livestock on the date that restocking eligibility is granted and previously paid compensation.	Earliest occurring: 1) Owner reports disease; or 2) Certified inspector detects disease; or 3) Quarantine measures imposed	*	Reporting: 24-hour limit for industry parties and states/territories Livestock owners must be represented by an industry organisation that is an EADRA signatory (unless the industry sector has gross value of production below AUD 20 million). Payment reduced if owner convicted of offence under any Act/regulations related to disease control/eradication. Dead animals fully indemnified if they would have been culled for control. Owners must notify within 24 hours.
Canada	✓	Market value up to established maximums, minus any value received from carcass. Assessed amounts intended to reflect reasonable depreciation on the market; thus, they are generally below the maxima. In absence of a market, an economic formula accounting for attained life-cycle phase and “grow-out” costs is used.	Market value the animal would have had at the time of its evaluation by the Minister if it had not been destroyed	✓	Reporting: immediately after incident The minister can partially or fully withhold compensation for violations or offences of the Health of Animals Act, so late reporting or any other act of gross negligence could result in loss of compensation. Dead animals covered only if they die after an applicable destruction order.

Germany	✓	Animal value assessed by district veterinary officers and limited by maxima specified in the Animal Disease Act. Generally, assessed values are lower than the maxima. The assessed amounts look at market value on the day culling was ordered, so if the market value drops as an outbreak unfolds, the values are lowered accordingly. If regional markets collapse, the estimate is based on EU figures for buying animals out of the market.	Date on which culling is ordered	✓	Reporting: immediately Farmers must cooperate in disease response efforts and accurately report livestock figures and pay levies. Failure to do so may lead to reductions or denials of compensation. Failure to report an outbreak is a criminal offence. Any reductions are evaluated case-by-case based on the degree to which the farmer failed to comply with regulations. Animals that died or were culled before notification are compensated at 50%.
Netherlands	✓	Animal/product value tables produced by a research university are used as guides by independent evaluators who factor in animal category, age, and purchasing price. Animals healthy at the time of veterinary inspection are indemnified at 100% market value.	Date of government decision to implement control measures	✓	Reporting: as soon as possible (a legal requirement) Compensation can be reduced if farmers do not follow reporting law or meet established sanitary standards. Visibly sick animals (during inspection) paid at 50%; dead animals at 0%.
Viet Nam	✓	Compensation now pays 70% of market value of culled animals, which is assessed on the basis of cost per kilogram. Central government sets homogenous rates (e.g. per head of poultry), but provinces divide animals into different categories such that compensation amounts differ.	Market value prior to outbreak	n.a.	Reporting: early – violating regulations on notification can nullify compensation. Livestock holders must declare the disease at an early stage and comply with government containment regulations, including susceptible animal movement/selling restrictions.

* The EADRA does not appear to specify a valuation appeal mechanism; however, the call for such a mechanism may be limited, because a second, top-up payment compensates for the difference between the market value of the replacement livestock on the date the property becomes eligible for restocking and the compensation amount previously paid.

Source: Civic Consulting (2011).

In summary, the following differences in the schemes' effective compensation values can be noted. First, Canada and Germany, unlike Australia and the Netherlands, limit market values assessed. Accordingly, there can be cases in which an assessment of, e.g. a rare animal's market value, would otherwise exceed the established compensation maxima. Meanwhile, Viet Nam currently pays 70% of *ex ante* market value (up from 10% to 15% in 2004, and to 50% between June 2005 and June 2008), whereas the other countries in the sample compensate the full market value (for Canada and Germany, this holds as long as market value is below the legal maximum amount).

The respective valuation rules also differ in other ways, e.g. compensation rates for sick/dead animals. Uniquely, Australia compensates the full farm-gate value of animals that die prior to notification of an outbreak so long as they would have been culled in subsequent

control measures and their deaths are notified by their owners within 24 hours. Conversely, dead animals are compensated in Canada only if their deaths follow issuance of an applicable destruction order. The German *Tierseuchenkassen* indemnify animals that die or are culled before notification at 50% of their assessed market value. On this point, the Netherlands appears to make the most substantial reductions for sick or dead livestock – animals visibly sick at the time of inspection (which follows notification) are indemnified at 50% and dead animals at 0%.

A second notable point of divergence is the date selected as the basis for market value determinations. This is important, given that outbreaks may lead to declines in prices of affected animals and products. As mentioned, Viet Nam employs *ex ante* market values and multiplies them by 70% to yield compensation amounts. The resulting amounts were updated in August 2011 to USD 1.75 per head of poultry, USD 1.9 per live weight kilogram of pig, and USD 2.25 per live weight kilogram of cattle. In contrast, the four other countries base market value derivations on – at the earliest – the date on which the disease was reported or detected. This is effectively the case in Australia, where the earliest occurring of three dates – owner notification, inspector detection, or imposition of quarantine measures – serves as the basis for assessment of farm-gate value. In contrast, Germany and the Netherlands base market value assessments on the date that control measures, i.e. destruction or slaughter, are ordered.

Finally, in a notable departure from the procedures employed in the other countries, Australian livestock holders are eligible for a second, top-up compensation payment which resolves the monetary difference between the previously paid compensation (i.e. the indemnification of the farm-gate value of destroyed and dead-from-the-disease animals) and the market value of equivalent livestock on the date that all restocking restrictions on the concerned property are removed. This results in a maximum compensation level equal to the market value of a full restocking of the property.

Similarity in the schemes' approaches is seen with regard to the conditionality attached to indemnification payments. All five schemes maintain disease notification requirements. Australia's is notable in that it specifies a 24-hour period in which notification must be given to the proper authorities. In contrast, the other schemes require "immediately after" (or similar) reporting of outbreaks or their suspicion. In Germany and the Netherlands, compensation can be reduced on a case-by-case basis for violations of reporting rules or laws. In Canada, contravention of the Health of Animals Act, which calls for immediate reporting of detected or suspected diseases, permits the government to withhold compensation partially or fully. Payment can also be reduced in Australia for convictions of offences under acts or regulations related to disease control. Similarly, in Viet Nam, violations of notification regulations (Veterinary Ordinance) can lead to compensation ineligibility.

Given that the efficient payment of eligible claims has been identified as a key goal for compensation schemes (World Bank *et al.*, 2006),⁶ Table 3.5 presents the timeframes within which the five schemes analysed for this report pay out indemnification. Canada and the Netherlands try to guarantee that payments will be made within two months; the *Tierseuchenkassen* in Germany allow for 90 days (in line with EU requirements). In Australia, the EADRA does not appear to specify a time limit for payment, but it does present deadlines for filing claims, and an interview with an official from Animal Health Australia suggested that payment is made in short order by the states/territories. Conversely, interviewees from the Ministry of Agriculture and Rural Development in Viet Nam indicated that one concern with their country's compensation scheme has been slow disbursement of compensation payments.

Table 3.5. Compensation practices: Payment timelines

	Date of payment	Procedural notes
Australia	n.a.	The EADRA specifies dates within which compensation claims must be made. For example, the initial claim must not follow livestock death or destruction by more than 90 days; and a request for a valuation of restocking cost needs to be made within 30 days of notification of restocking eligibility. Compensation payments are made in short order by the states/territories.
Canada	Six to ten weeks (about two months)	This timeframe assumes the livestock holder does not appeal the initial compensation evaluation – an appeal must be made within three months of receipt of the evaluation form.
Germany	Within 90 days (three months)	The start date for this time period is the destruction or slaughter of the concerned livestock.
Netherlands	Usually one month, sometimes two	Generally, compensation is paid within one month after the valuation, and the government tries to guarantee that payments follow depopulation/destruction by no more than 60 days.
Viet Nam	Disbursement can be “slow”, according to interviewees	Funds from the central government are sent to the financial department at the provincial level. This department then allocates the central government funds, along with additional provincial funds, to the district financial department, which in turn allocates the total compensation payment to the communes where it is distributed to individual farmers.

Source: Civic Consulting (2011).

In terms of distinguishing between different types of livestock diseases, e.g. between zoonotic diseases and those that primarily or nearly exclusively affect industry production, the EADRA in Australia most substantially differentiates procedures in accordance with its disease classification system. This system categorises diseases into four groups based on factors such as their potential human/environmental and socio-economic impact and establishes a different industry-government cost-sharing ratio for each group (Table 3.6).

In the other two countries with cost-sharing schemes, diseases are not categorised in this manner. The procedures employed by the *Tierseuchenkassen* do not depend on the type or extent of a disease, and the cost-sharing proportions between the state governments and farmers remain constant (each stakeholder pays 50% of non-EU-reimbursed sharable costs, regardless the disease in question). The Netherlands also does not differentiate procedures based on disease type. However, because the industry share of the response costs to various diseases is not based on a percentage- but rather a contribution ceiling, the proportion of final costs borne by government and industry can vary by disease.⁷ Finally, given that funding for compensation payments made in Canada and Viet Nam comes entirely from public sources, there is no opportunity for differentiation based on cost-sharing in those countries.

Based on interviews conducted for the case studies presented in this report, it can be noted that governments of three of the five countries have made *ad hoc*, compensation-type payments related to recent outbreaks of epidemic livestock diseases. Germany and Viet Nam (since implementing its compensation scheme in 2004) are the two countries for which no such *ad hoc* payments were reported. Details of the payments made by the Australian Commonwealth Government and the Dutch Government are presented in Table 3.7, which also contains an example of an *ad hoc* programme implemented in Canada. Under the Business Risk Management suite of agricultural risk related programmes, Agriculture and Agri-Food Canada now manages what could loosely be termed a structured *ad hoc* framework – AgriRecovery. The BSE recovery programme identified in the table was implemented prior to the development of AgriRecovery, which is a cost-sharing framework that now allows for flexible programmatic responses to livestock or other agricultural disasters and is thus an important part of livestock disease risk management in Canada.

Table 3.6. Compensation practices: Coverage of livestock diseases

Diseases covered		Differentiated treatment of diseases?	
		Differentiation	Explanation
Australia	The EADRA cost-sharing mechanism covers 65 emergency animal diseases in four groups, and there is a mechanism to cost-share expenses from non-listed diseases under certain conditions. Categorisation rests on several factors, including potential socio-economic losses, human or environmental health consequences, and economic impact on the industry.	Yes	Based on the beneficiary-pays principle: <i>Category 1</i> : 100% government funding → very high public benefits <i>Category 2</i> : 80% government and 20% industry → high public benefits <i>Category 3</i> : 50% government and 50% industry → moderate public benefits <i>Category 4</i> : 20% government and 50% industry → low public benefits
Canada	No all-inclusive list of compensation-eligible livestock diseases exists. As long as an animal is destroyed under the <i>Health of Animals Act</i> compensation is payable. Yet, the diseases that typically prompt destruction orders are those listed as "reportable". This category comprises 32 diseases which must be immediately notified to a district veterinarian by livestock owners, veterinarians, and laboratories.	No	The compensation scheme does not differentiate between types of livestock diseases, e.g. between zoonoses and diseases that purely impact animal production. The procedures are the same in all cases involving destruction orders issued by CFIA district veterinarians, and payment is always made through the federal budget.
Germany	Notifiable epidemic livestock diseases such as BSE, classical swine fever, avian influenza, bovine tuberculosis, foot-and-mouth disease, Aujeszky's disease, scrapie, and anthrax.	No	Compensation payments do not depend on the type or extent of a livestock disease, and the public-private cost-sharing proportions remain constant.
Netherlands	Compensation for direct losses under the Animal Health Fund is covered by the government-industry agreement for the following 14 diseases: avian influenza, African swine fever, classical swine fever, Q fever, bluetongue, bovine spongiform encephalopathy, bovine tuberculosis, brucellosis, foot-and-mouth disease, Newcastle disease, scrapie, brucella melitensis, swine vesicular disease, and bovine leucosis.	n.a.	Compensation procedures do not change with disease type. However, there is some financing differentiation because the Product Boards are liable for different contribution ceilings based on the various species/diseases in their respective sectors, e.g. the industry share of response costs for different diseases is – though potentially often 100% – actually variable in some cases due to government funding of costs above the contribution ceilings.
Viet Nam	Avian influenza, foot-and-mouth disease, and porcine reproductive and respiratory syndrome	No	The compensation scheme does not differentiate between the three diseases.

Source: Civic Consulting (2011).

Table 3.7. Compensation practices: Reported *ad hoc* payments related to livestock diseases

	<i>Ad hoc</i> payment reported	Notes
Australia	Yes	Equine Influenza 2007 – Although this disease is among the 65 listed in the EADRA, at the time of the outbreak the affected equine industry sectors had not yet signed this Agreement. Accordingly, the cost-sharing mechanism was not officially invoked during the course of the response. The Commonwealth Government ultimately underwrote the industry's share of the response costs and made substantial support payments to various affected stakeholders. ¹ Notably, the outbreak was “abnormal” to some extent because it originated with imported horses and likely passed through quarantine measures on a person or equipment that had been in contact with the animals (Callinan, 2008, pp. xvi, xvii). Also, the horse industry had expressed an intention to become an EADRA signatory prior to the outbreak but progress was delayed by development of the required levy.
Canada	Yes	BSE 2003 – The BSE recovery programme was begun in mid-2003 to provide financial aid to Canadian cattle producers affected by the closure of all major beef and cattle export markets following the detection of a cow in Alberta with BSE. The programme's budget was CAD 460 million, and this amount was cost-shared on a 60-40 basis between the federal government (CAD 276 million) and the participating provincial/territorial governments (CAD 184 million). The payments partially compensated for the difference between the price received for cattle sold for slaughter in Canada after the outbreak and a reference price based on market value in the United States (Agriculture and Agri-Food Canada, 2011).
Germany	No	n.a.
Netherlands	Yes	Q Fever 2009/2010 – Significant numbers of pregnant female goats were culled beginning in December 2009, and a breeding ban was subsequently introduced because the disease can spread quickly through the birthing process. Female goats without young were not culled, thus remaining a financial responsibility for their holders. These holders were later compensated – with payments per animal – for the disadvantage they experienced as a result of the breeding ban and their inability to use the female goats for milk production. The decision to compensate in this case was made at the ministerial level.
Viet Nam	No	n.a.

1. The sum of these compensation-like payments committed to by the Commonwealth Government was AUD 268.8 million. They were provided “directly to individuals and businesses whose primary source of income had been affected by the outbreak and the subsequent movement restrictions” (Callinan, 2008, p. 12).

Source: Civic Consulting (2011).

3.3 Financial structures

As noted in the “institutional frameworks” section above, one of the main typological distinctions among this group of compensation schemes derives from the funding mechanisms on which they rely. This distinction establishes one group of public-private cost-sharing schemes and another comprising the purely publicly funded schemes. As Table 3.8 depicts, the financing arrangements of the latter group are less complex than those of the former group's members. Still, in Viet Nam, the sharing of financial responsibility for compensation funds between the central and provincial governments, as well as the influx of international donor contributions, yields a multi-layered financial picture. In comparison, Canada's funding of compensation directly through the federal budget is simple. However, the relative complexity seen in Viet Nam may serve an important purpose, because “The level of risk

sharing between central governments and province authorities often determines each actor's behaviour and consequently the effectiveness in containing disease spread" (World Bank *et al.*, 2006). Where the central government is mainly liable for financing and risk, less pressure is put on provincial authorities to contain outbreaks and subsequently to ensure that compensation reaches affected livestock holders.

Examining the three schemes reliant on public-private cost-sharing also reveals differences in detail. The most visible of these differences lies in the *ex post* nature of the levies utilised, when or if necessary, by Australian livestock industry sectors to reimburse the Commonwealth Government for its payment of the industry share of a disease response. In contrast to this use of zero-based levies in Australia, livestock producers in Germany and the Netherlands pay levies on an ongoing, annual basis. There is, of course, still a strong *ex post* aspect to these levies – if a disease outbreak triggers reserve-overwhelming expenses, then the levies are increased to enable the affected industry sectors to reimburse the *Tierseuchenkasse*/German federal state or Dutch Government for their initial coverage of the industry sector(s)' share of control costs.

The industry levies employed in all three cost-sharing schemes are differentiated by sector. Additionally, in both Australia and Germany, financial responsibility for control costs is to some extent differentiated by (federal) state/territory. In Germany, this occurs with respect to both the government contributions and the industry levies because there is an independently operated *Tierseuchenkasse* in each federal state (except in Bremen, which is covered by the *Tierseuchenkasse* of Lower Saxony). Meanwhile, in Australia, distribution of cost-sharing contributions among the states/territories is based, for Category 1 diseases, on their respective human populations. For other disease categories, the shares are based on their relative populations of the concerned livestock species, their shares of the gross value of production of the affected industry, or a combination of the two.

Under the three cost-sharing schemes, the livestock industries also contribute to such "peace-time" expenditures as disease monitoring or training programmes. For example, in Australia, the costs of training programmes and annual workshops which review the EADRA are equally shared among the Commonwealth, the state/territory governments, and the full industry members of Animal Health Australia (the industry organisations contribute to these costs through membership subscriptions to Animal Health Australia). In the Netherlands, "peace-time" costs are divided evenly between government and industry.

The Dutch cost-sharing framework is unique in that, if control costs in the case of an outbreak disease do not exceed the contribution ceilings negotiated between government and the industry Product Boards, they are entirely funded by the industry. This represents a substantial departure from the Australian and German schemes in which the relevant governments (e.g. Commonwealth, federal state, state, or territory) always pay a prescribed portion of control costs.

Table 3.8. Financial structures: Scheme-financing mechanisms

Overview of scheme financing	Cost-sharing with livestock industry		
	Cost-sharing	If yes, levy timing	Industry fundraising mechanism
Australia	Each participating Lead (state/territory) Agency initially pays its own costs during a disease response before the cost-sharing formulae are used for reimbursement. Commonwealth Government can pay the industry share of costs after an outbreak, and the affected industry(s) then have ten years to reimburse the government. The governments' cost-shares are split such that those states/territories benefiting most from a disease response pay more.	Yes	<i>Ex post</i> Industry sectors use zero-based, i.e. only activated when necessary, statutory levies to raise funds. If a disease affects multiple species, the cost-shares of the affected industries are based on their respective gross values of production (GVP) and a weighting that reflects the disease's impact on them. When multiple industry parties represent a single affected species, the cost-sharing is determined by the parties.
Canada	Compensation payments are funded directly through the federal budget. The funding is <i>ex post</i> and loss-dependent in that it is utilised to compensate owners of destroyed animals or products following an outbreak.	No	n.a.
Germany	<i>Tierseuchenkassen</i> are generally equally funded by farmers and the corresponding federal state, with a portion of outbreak losses co-financed by the European Union. Ultimately, up to 50% of eligible costs are reimbursed by the European Union, and the remaining amount is shared equally between farmers (through levies paid to the <i>Tierseuchenkassen</i>) and federal state government. The <i>Tierseuchenkassen</i> aim to build reserves near 5% of the market value of insured livestock. If compensation costs overwhelm reserves, state governments pay costs and farmers repay through increased levies.	Yes	<i>Ex ante / ex post</i> Mandatory, specie-based levies are set by the <i>Tierseuchenkassen</i> and authorised by the state governments. The levies are continuous (i.e. <i>ex ante</i>), but are, if necessary, increased <i>ex post</i> . In practice, levies are mainly differentiated by regional risk, the absence of infectious diseases, and, in some cases, implementation of specific hygiene standards. However, a number of <i>Tierseuchenkasse</i> only significantly differentiate levy rates by species.
Netherlands	Negotiations between the government and the three Product Boards determine the livestock industry's contribution ceilings. After an outbreak, the government initially covers costs, and then invoices the relevant Product Board up to its contribution ceiling. When costs exceed the ceiling, the government pays the additional costs and is partially reimbursed by EU co-financing. "Peace-time" disease monitoring and structural costs are shared on a 50/50 basis between government and industry.	Yes	<i>Ex ante / ex post</i> Product Boards raise funds through levies on livestock holders. After an outbreak, the levies on the affected sector are increased, if necessary. Levies are both <i>ex ante</i> (because of their continuous nature and the sharing of "peace-time" monitoring costs) and <i>ex post</i> , but the latter aspect is more significant because for larger (i.e. reserve-overwhelming) outbreaks, the majority of industry contributions will be raised <i>ex post</i> via increased levies.

Overview of scheme financing		Cost-sharing with livestock industry		
		Cost-sharing	If yes, levy timing	Industry fundraising mechanism
Viet Nam	The principles guiding the financing of compensation for culling-affected poultry and livestock producers include: 1) The central government contributes 60% to 80% of disease control costs (through the National Prevention/Emergency Fund), with the rest financed by provincial Prevention/Emergency budgets; 2) Hanoi and Ho Chi Minh City do not receive central government contributions; 3) When provincial shares of control costs exceed 50% of the local Prevention/Emergency budget, the central government pays remainder of costs; 4) In provinces where costs are below USD 50 000, they are paid from the local Prevention/Emergency budget.	No	n.a.	n.a.

Source: Civic Consulting (2011).

3.4 Incentives for notification and prevention practices

Assuming that the livestock industry is widely familiar with it, the very presence of an efficiently functioning compensation scheme should incentivise early reporting of disease incidents, as well as broader co-operation with disease control measures, relative to the same country/disease context without a compensation scheme. Indeed, early reporting and full industry co-operation with control/eradication efforts are the public goods which compensation schemes are intended to produce. That said, not all compensation schemes are designed equal – several of their common features can be tailored so as to more (or less) strongly incentivise early notification of outbreaks by livestock holders. For example, incentives for early reporting can probably be enhanced (or lessened) through the specifics of compensation procedures and levels, as well as the design of reporting requirements.

Table 3.9 shows how the five compensation schemes examined in this report have approached the scheme elements – reporting requirements, (reduced) compensation for sick or dead animals, and overall compensation levels – which are expected to impact heavily on livestock holder notification. Perhaps most notable about the left half of the table is the starkly similar approaches taken by the schemes with respect to the establishment of penalty-supported reporting requirements and reductions in compensation for sick or dead animals. Uniformity, with perhaps one significant exception, characterises the positions taken on reporting and reductions for dead animals. The exception is the Australian scheme, which fully indemnifies the farm-gate value of animals that die prior to not just their destruction/slaughter or its mandate, but to notification of disease presence. This contrasts with the German, Dutch and Canadian compensation schemes, which reduce or deny compensation for animals that die prior to disease notification, veterinary inspection, and the issuance of a destruction order, respectively. Indeed, if an animal dies prior to post-notification inspection in one of these three countries, the highest indemnification level, at 50%, would be found in Germany.⁸

Table 3.9. Notification incentives: Mechanisms that may motivate early reporting

	Reporting requirements			Compensation-based incentives		
	Hour- or day-based reporting requirement	Must report “immediately” or “as soon as possible” after incident	Potential penalisation for failure to report on time	Compensation for sick or dead animals		Effective compensation levels (healthy animals)
				General rule	Explanation	
Australia	✓		✓	Equal to that for healthy animals culled	EADRA fully compensates animals that die prior to notification if they die of the relevant disease and would have been culled. Owners must notify within 24 hours.	Market (farm-gate) value of restocking (via top-up payment)
Canada		✓	✓	Reduced or none	Dead animals indemnified only if they die after issuance of an applicable destruction order.	Capped market value
Germany		✓	✓	Reduced or none	Animals that die or are culled before notification of the disease are only indemnified at 50% of market value.	Capped market value, late assessment date
Netherlands		✓	✓	Reduced or none	Animals visibly sick at time of inspection are indemnified at 50% of market value; dead animals at 0%.	Market value, based on established guidelines, late assessment date
Viet Nam		✓	✓	Reduced or none	Payment is conditional on the health of the animals in order to encourage early reporting. Animals that die prior to official culling approval not indemnified.	70% of <i>ex ante</i> market value

Source: Civic Consulting (2011).

These reductions in compensation payments for dead animals are in keeping with established good practice in scheme design. It is thought that reducing or eliminating payments for animals that die prior to their destruction or, at the very least, the notification of their infection, significantly incentivises early reporting by their owners (see, for example, World Bank *et al.*, 2006). The Australian scheme aims at the same goal, namely rapid reporting of disease outbreaks, but does so through arguably stricter notification requirements. The EADRA states that notification of animal death from a reportable disease must be made within 24 hours. This is arguably more concrete than the “immediately after” or “as soon as possible” requirements seen elsewhere. Additionally, the EADRA requires industry parties to advise their members to notify authorities within 24 hours of an incident, and a state/territory may lose claims to cost-sharing under the EADRA through failure to notify the Consultative Committee on Emergency Animal Diseases of an incident within 24 hours. In sum, there is a heavy focus on notification requirements in the EADRA. The question of which method – Australia’s regulation-centric approach, or financial incentives seen elsewhere⁹ – is more effective cannot be answered here, but it is notable that an official from Animal Health Australia reported no problems experienced to date with late reporting (neither did the interviewees from the other three OECD member countries).

There may be a different source of merit in the Australian approach to incentivising early reporting. In areas or countries where there is likely to be a substantial time lag between farmers’ notification of a disease and the arrival of an inspection team or destruction order, non-compensation or heavily reduced compensation for dead animals may provoke discontent. In such contexts, farmers might appropriately notify authorities as soon as feasible only to see their compensation-eligible animals die before the inspection visit or issuance of a destruction order. The rapidity with which avian influenza kills birds could provoke such cases, especially in developing countries where infrastructural and procedural impediments slow down inspectors or implementation of culling plans.

The other side of the guideline that animals dead before inspection or destruction should not be fully compensated is that compensation for live animals must be sufficient to avoid situations in which a financial incentive exists for the selling of an animal from an infected area prior to notification of the disease’s presence. Such an incentive might exist if the sale would yield significantly more money than the compensation payment. On the question of whether any of the five schemes provide insufficient compensation levels, some experts (World Bank *et al.*, 2006) have identified the 75% to 100% of market value range as the most appropriate¹⁰ – rates below 50% are seen as likely to prompt insufficient compliance with the scheme and thereby control efforts. Thus, Viet Nam’s compensation rate of 70% of market value (final column, Table 3.9) is near the lower recommended boundary, according to these guidelines. Certainly, the previous rates implemented in Viet Nam (10% to 15% in 2004 and 50% between June 2005 and June 2008) were significantly below the guidelines. In the four OECD member countries, under-compensation does not appear to occur. Australia effectively pays 100% of the value of a farm-gate restocking through the second, top-up payment that is a feature of the EADRA’s compensation provisions. Canada and Germany indemnify full market value except in cases where the established maxima would be breached by the value assessment. The Netherlands compensates healthy animals at full market value, though it bases that determination, like Germany, on the date when control measures are ordered, by which time market prices could potentially have fallen significantly.

Further complicating the issue of appropriate compensation levels is the opposing concern, namely that where compensation is set too high, moral hazard may occur. This refers to the development of incentives against the practice of robust biosecurity because of the knowledge that if an outbreak occurs, sufficient compensation will be provided. Overly generous compensation levels may also incentivise illegal animal movements designed to obtain the highest possible compensation, especially in situations where market prices have

been affected by the outbreak, and livestock identification systems are not in place. In other words, compensation levels higher than appropriate may prompt the development of adverse incentives. Thus, in sum, prices need to be sufficiently high to encourage early and complete reporting, as well as general co-operation with control measures, but not so high that they lead to the creation of adverse, moral hazard related incentives (World Bank *et al.*, 2006). On this point, the schemes studied here guard in various ways against potential overcompensation; thereby, they attempt to ensure incentives for appropriate biosecurity/hygiene practices.

Notable in this context is the relatively late date on which the German *Tierseuchenkassen* base their market value assessments. If a livestock property is infected “late” in the course of an outbreak, assessed compensation payments may be lower than for similar animals on previously infected properties, because market prices might have fallen as a result of the outbreak. This feature of the value assessment mechanism limits adverse incentives that might otherwise result from disparities between falling market prices and static compensation levels.

Also, the per-animal maximum compensation amounts established in Canada and Germany, as well as the market value guidelines produced by researchers and utilised by assessors in the Netherlands, work to ensure that animal worth is not significantly overvalued by evaluators. Similarly, Viet Nam’s post-2008 compensation level of 70% of market value ensures that livestock holders will bear a portion of any direct losses resulting from an outbreak (as well, of course, as the full burden of consequential losses).

Next, the schemes’ consistent non-indemnification of consequential losses means that livestock holders in all five countries bear at least some consequential losses in the event that an outbreak occurs.¹¹ This financial threat may contribute to incentives for engagement in risk-mitigating behaviour at farm level. However, there is seemingly a trade-off inherent in this non-coverage: while maintenance of the principle that consequential losses are a private-sector responsibility may incentivise biosecurity/preventive measures in “peace-time”, it may also problematically impose financial disadvantage on farmers who fully cooperate with movement restriction zones or vaccination-based control measures once an outbreak occurs. Such disadvantages result because restriction zones prompt indirect losses (such as feed costs for animals that cannot be sold; dairy products that cannot be sold; welfare slaughter costs, etc.), and one consequence of emergency vaccination is that animals and animal-associated products often lose significant value, with the amount depending on the acceptance of vaccinated animal products by food chain operators and consumers. This can lead to a situation where a livestock holder in a restriction zone would be in a better financial position if the livestock were infected and culled (and consequently compensated). Potentially adverse incentives could be prevented through a compensation scheme or (private) insurance-based solution for consequential losses of livestock holders that are under movement restrictions or where livestock is subject to emergency vaccination. While the Netherlands is currently working on a potential scheme to cover some consequential losses (under the twin principles that there should be no distinction in financial outcome between farmers in a culling zone and farmers in a restriction zone, or between culled farms and vaccinated farms), other countries have taken a different approach to this issue. For example, an official from the Lower Saxony *Tierseuchenkasse* reported that, in the absence of a compensation-based solution to consequential losses in restriction zones, the pursuit of an extraordinary state of response readiness should be pursued. This would ensure that the duration and extent of restriction zones are minimised.

In addition to constraints on compensation rates which may work to maintain risk aversion levels and accordingly incentivise adherence to biosecurity and hygiene standards, there are other mechanisms through which the schemes promote biosecurity. These can broadly be grouped into two categories (Table 3.10), one comprising features related to public-private cost-sharing and the other being the formal requirement of biosecurity plan development or adherence to hygiene standards.

The cost-sharing mechanisms employed by Australia, the German *Tierseuchenkassen*, and the Netherlands to fund their compensation schemes likely serve to limit adverse incentives. As the OECD (2011) has noted, “cost sharing between stake-holders ... and industry co-responsibility are elements of a practical industry-wide arrangement to prevent moral hazard.” Under these schemes, industry stakeholders are both liable for a share of disease control costs in the event of an outbreak and are involved in decision-making. This engenders awareness of their responsibilities related to animal health. Indeed, the dual, *ex ante* and *ex post* nature of the German and Dutch industry levies may function particularly well in terms of increasing this type of awareness. This is because the timing of premium/levy payment is thought to influence risk awareness and prevention incentives, with a mix of *ex ante* and subsequent *ex post* payments having in theory the greatest impact (Melyukhina, 2011).

Table 3.10. Prevention incentives: Mechanisms that may promote biosecurity

	Cost-sharing			Biosecurity plans	
	Cost-sharing	If yes, levy timing	Levies differentiated by individual properties' relative risk levels?	Biosecurity plans required	Details
Australia	Yes	<i>Ex post</i>	No – only industry sectors affected by a disease pay share of control costs, but the <i>ex post</i> levies are assessed on all farmers in a given sector at the same rate.	Yes	Industry parties commit to development of biosecurity plans through EADRA Clause 14.
Canada	No	n.a.	n.a.	Other	The Canadian Food Inspection Agency has recently been developing voluntary national standards for farm-level biosecurity.
Germany	Yes	<i>Ex ante/ ex post</i>	To some extent – in practice, levies are mainly differentiated by regional risk, the absence of infectious diseases, and, in some cases, implementation of specific hygiene standards; however, a number of <i>Tierseuchenkassen</i> only significantly differentiate levy rates by species.	Other	Hygiene standards or disease-free status (in some federal states used to differentiate levies)
Netherlands	Yes	<i>Ex ante/ ex post</i>	No – the levy system is not differentiated by the risk profiles of regions or individual livestock holdings (and their preventive practices).	Other	Livestock holders must meet certain hygiene and disease prevention standards – proof that negligence led to an outbreak could prompt financial penalties.
Viet Nam	No	n.a.	n.a.		n.a.

Source: Civic Consulting (2011).

Indeed, depending on the details of their implementation, cost-sharing arrangements may adhere to some of the methods for mitigating the disadvantages of compensation, including moral hazard, that were identified above in Section 3.1. Specifically, annual levy payments could be scaled according to risk, thereby penalising those regions or individual properties posing the highest animal health risk or, similarly, easing the levy burden for properties that participate in certain risk-mitigation practices. The *Tierseuchenkassen* do effectively scale levies based on regional risk due to their financially independent operations in the different federal states, and in some of the federal states contributions are specifically scaled for individual livestock holders based on the health status of livestock.¹² However, levies in the Netherlands are not adjusted on a regional or individual risk basis. Given the mechanism's potential to incentivise heightened biosecurity, it is interesting that levy differentiation based on individual risk, or on biosecurity levels implemented at individual holding requirements, is not widely used in Germany or the Netherlands despite the fact that it is feasible (because the livestock industries in both countries use annual, *ex ante* levies to meet their cost-sharing responsibilities).¹³

The last columns of Table 3.9 show that the schemes in the four OECD member countries in the sample also incentivise or require biosecurity or hygiene standards through agreement or regulation. In Australia, Clause 14 of the EADRA specifies the industry sectors' commitment to development of biosecurity plans, while in the Netherlands gross negligence in failing to meet established hygiene standards could result in financial penalisation (withholding of compensation, for example). In Canada, the Canadian Food Inspection Agency has recently been publishing voluntary national standards for farm biosecurity in different agricultural sectors.

To conclude this section on incentives created by the compensation schemes, Table 3.11 offers a brief overview of interviewees' impressions of livestock industry participation in and adherence to the schemes. Overall, practical experience in scheme administration appears favourable, though specific concerns were mentioned by the interviewees from Viet Nam.

Table 3.11. Reported practical experience with incentives related to compensation

Practical experience as reported by interviewees	
Australia	Animal Health Australia reports no negative experiences associated with adverse compensation-linked incentives, e.g. a failure to report a disease incident. Livestock industry adherence to the agreement has reportedly been firm.
Canada	The Canadian Food Inspection Agency's experience to date has shown that stakeholders are overwhelmingly cooperative and make use of the compensation scheme as intended.
Germany	Following a bluetongue outbreak in Lower Saxony in 2008, 97% of 87 000 compensation applications were approved. This suggests widespread acceptance of the programme because for applications to be approved livestock holders must properly register with a <i>Tierseuchenkasse</i> , must pay levies in a timely manner, and must follow rules for reporting, claiming compensation, and submitting necessary supporting materials.
Netherlands	The scheme-administering ministry feels that the compensation programme adds to overall awareness of livestock holders' animal health responsibilities, not least because the holders have to pay levies annually and are knowledgeable about the contribution ceilings and prospective levy increases in the event of an outbreak.
Viet Nam	Interviewees expressed concern on 1) potentially too-low compensation rate; 2) slow payment disbursement; and 3) heavy bureaucratic administration, but suggested that producers are more willing to notify diseases and cull their animals in the event of an outbreak of avian influenza or one of the other two diseases covered.

Source: Civic Consulting (2011).

3.5 Conclusions

This chapter has examined five compensation schemes that share several key aspects and procedures. For example, timely reporting requirements backed by potential penalisation in the form of reduced or withheld compensation are specified for all schemes. Reliance on market value (or a percentage of it in the cases of Viet Nam's compensation rate and reductions for dead livestock applied by the Dutch and German schemes) as the basis for assessing animals' indemnification values is universal, though Canada does provide for the use of production-cost formulas in the absence of a functioning market.

The most significant deviation from the observable similarities in the schemes' design is the cost-sharing aspect of the Australian, German, and Dutch compensation schemes. Within this smaller group, a second categorisation can be made: whereas in Australia and Germany the relevant governments always pay a portion of outbreak control costs, in the Netherlands such costs up to the negotiated contribution ceilings are covered entirely by the livestock industry. A third distinction is also visible: industry levies in Germany and the Netherlands are *ex ante* and *ex post* in nature, while in Australia they are zero-based, and therefore entirely *ex post* (though limited "peace-time" contributions, in the form of membership fees, are made by industry organisations to Animal Health Australia).

Looking at the financing of the publicly funded schemes, the key difference is that the Canadian compensation scheme is entirely funded through the federal budget, while the funds for Viet Nam's compensation payments generally come from both central government and provincial funds.

Turning to compensation procedures, differences are visible in procedural details. Though all schemes base indemnification amounts on market value, effective contribution amounts vary, with Australia's scheme probably providing the highest effective level of compensation, namely the market value of a restocking. On the other hand, Viet Nam's compensation rate of 70% of market value is the lowest rate observed for the schemes scrutinised. However, Germany's use of the date on which culling is ordered as the basis for market value assessments means that compensation rates there can potentially decrease to a relatively low percentage of the *ex ante* (pre-outbreak) market price. This would likely happen in the case of an extended outbreak that drives down prices. The effective compensation levels provided by Canada and the Netherlands likely fall in mid-group: Canada appears to use a later date for market value assessments than Australia and also caps its compensation amounts, while the Netherlands indemnifies the full market value of healthy animals but maintains perhaps the strictest compensation reductions for visibly sick and dead animals.

In conclusion, there would appear to be considerable scope for variants of animal disease compensation schemes, tailored to specific industry/disease situations, which can both reward and promote good disease risk management practices and appropriately share costs across producers and between producers and government. It is likely that other policy instruments are also needed to work in a complementary way with any system of compensation payments – such as enabling legislation, possible taxation by means of producer levy payments,¹⁴ and institutional arrangements to administer the scheme.

Notes

1. This chapter is mainly based on the report “Management of risks from epidemic livestock diseases: Overview of key issues and comparison of compensation and cost-sharing systems in selected countries” prepared for the OECD by a team from Civic Consulting (Germany). This report covered five countries (Australia, Canada, Germany, The Netherlands and Viet Nam) and is also the base for the corresponding sections on compensation schemes in the country chapters of Part II.
2. Indeed, the reduction of uncertainty with regard to business operations functions as an incentive for livestock owners to participate in cost-sharing schemes and/or adhere to compensation scheme rules. Notably, though, a government’s repeated issuance of *ad hoc* payments following disease outbreaks could serve to decrease this incentive, as livestock owners become relatively “certain” of receiving such payments if affected by an outbreak.
3. These difficulties tie into the general problem presented by the high monitoring costs associated with “pollution” in the case of epidemic livestock diseases.
4. Additional applicable insurance products may have recently emerged (Melyukhina, 2011).
5. It should be noted that assessing compensation payments on the basis of market value generally cannot lead to entirely consistent results: the establishment of fair market value ideally requires an actual transaction. Many countries use expert assessors to determine the market value of compensation-eligible livestock, but this approach can have drawbacks, including potentially inaccurate or biased assessments, as enumerated by Ott (2006, pp. 71, 72). The potential for inconsistencies in the assessment process, such as overvaluations, is likely part of the reason that countries such as Germany, Canada, and the Netherlands have either established maximum compensation amounts per animal type or have chosen to base assessors’ work on expert guidelines. The inclusion of appeal processes that can be launched by livestock holders in several of the compensation schemes’ procedures (Table 3.5) is probably also an outgrowth of general concerns with assessment procedures or livestock holders’ complaints regarding initial value calculations.
6. Indeed, it has been noted that “In dealing with small farmers in developing countries, compensation should be paid within 24 hours of culling by cash ... any delay is likely to have a significant effect on reporting” (World Bank *et al.*, 2006).
7. Assuming that expenses breach the applicable contribution ceilings below which only the industry pays.
8. Canada would require a destruction order, so that the animal would need to be alive at the time of inspection, and in the Netherlands it is also required that the animal be alive when a property is inspected.
9. “Most schemes globally do not cover losses from animals dead by the disease before official culling” (World Bank *et al.*, 2006).
10. The lower bound is suggested for contexts in which authorities’ control over animal movements is poor, while the 90%-plus rate is deemed suitable when the enforcement of movement restriction zones is practicable. This guidance takes into account the possibility that a high compensation rate and a low level of control over animal movements could prompt attempts to move animals into culling zones. Similarly, if compensation rates differ between states or provinces, as they do in Viet Nam, there may be an incentive to move animals across state/provincial borders toward higher compensation rates.
11. As explained in Chapter 7, Agriculture and Agri-Food Canada manages a suite of Business Risk Management programmes which can to some extent provide coverage of consequential losses resulting from a livestock disease outbreak. However, these

programmes are not designed to fully reimburse livestock holders' consequential losses, and indeed the primary income stabilisation programme, AgriStability, only issues payments when whole-farm margins drop by at least 15% relative to reference margins.

12. Lower Saxony's *Tierseuchenkasse* currently reduces levies for livestock holders whose farms are free from bovine herpes virus Type 1 (BHV1). In 2011, BHV1-free farms paid EUR 6 per animal, while farms not declared free of the virus paid EUR 13 per animal. The difference is equal to the cost of vaccines and medical examinations.
13. Between 1996 and 2000, lower levies were collected from farms in the federal state of Lower Saxony if they met specific hygiene standards, but this practice was discontinued following an analysis that showed losses were not significantly lower for these farms.
14. Payment of levies should be compulsory in order to prevent free-riding and help incentivise good practice. Ultimately, producer participation/inclusion in cost-sharing schemes should be as comprehensive as possible to avoid uncertainty during an outbreak.

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PART II.

COUNTRY CASE STUDIES

Chapter 4.

Australia¹

This chapter describes important features of the animal disease management system in Australia. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The second section analyses compensation schemes and the system of incentives, including institutions, compensation practices, financial structures, and incentives for notification and prevention. The concluding table summarise the main characteristics and challenges.

Australia, officially the Commonwealth of Australia, is the world's sixth-largest country, with a total area of 7 741 220 km², and about 22 800 000 people who are concentrated along the eastern and southern coasts, with high GDP per capita (USD 41 000 PPP, according to a World Bank, 2010 estimate). About 70% of the country is arid or semi-arid, and a large part of the centre is unsuitable for settlement. Australia has fertile areas close to the coast, where the bulk of the population lives. Here, Australians experience a range of climates, from wet and humid tropical conditions in the far north, through warm and temperate conditions on the central east and west coasts, to cooler conditions on the southern coasts and in Tasmania.

Australia is a constitutional monarchy with a federal division of powers. The federal government is separated into three branches: the legislature, the executive and the judiciary. There are six states – New South Wales, Queensland, South Australia, Tasmania, Victoria, and Western Australia – and two major mainland Territories—the Northern Territory and the Australian Capital Territory.

Australia has a population of more than 27 million head of cattle, and around 80 million head of sheep, distributed over all states and territories. The cattle are reared on pasture as the principal source of feed. In southern Australia, beef cattle are often reared on smaller properties as part of a mixed farming or grazing operation, but some properties specialise in producing cattle. In the “Top End” of the Northern Territory, sub-tropical areas and in arid inland regions, cattle are bred on native pastures on extensive cattle stations. Some herds can be as big as 585 000 head, and are owned by companies (e.g. North Australian Pastoral Company Pty Limited, Australian Agricultural Company). For these big herds, means of transportation and communication are well developed (for instance, helicopters). Most Australian sheep are produced as part of mixed-farming enterprises, frequently with cropping and beef production, and are used to produce meat and wool over a wide range of environments.

Australia is among the most important livestock producers and exporters in the world. It is:

- the seventh producer of beef meat (after the United States, Brazil, the European Union, China, India and Argentina) and the second exporter
- the fourth producer of sheep (after China, India and the European Union) and the second exporter (after New Zealand), and
- around the tenth dairy producer, and around the third or fourth dairy exporter.

Australia's sanitary status is good, but there are several endemic diseases of national significance, e.g. Johne's disease, infectious bovine rhinotracheitis, and tick fever. The geographic and climatic diversity of the country means that several endemic diseases are restricted in distribution, e.g. tick fever is found only in the north of the country where conditions are more tropical. Australia's advantageous geographical setting for animal health (Neumann and Keogh, 2006) has recently prevailed: during the past five years the country has experienced few outbreaks of OIE-notifiable livestock diseases. The equine influenza outbreak that began in August 2007 is the one significant exception. Other epidemics which have occurred, such as near-yearly anthrax outbreaks, can be characterised as relatively minor. Per-year animal deaths from anthrax have ranged from two dozen in 2010 to a few hundred in 2009, with 2006, 2007, and 2008 accounting for around 360 aggregate deaths.² Additionally, there were 192 combined cattle deaths from bovine anaplasmosis (10) and bovine babesiosis (182) during 2005/2006. According to OIE notification records, no terrestrial livestock were destroyed or slaughtered as a result of disease control measures between 2005 and 2010. Most recently, Australia notified a first occurrence of Newcastle

Disease in pigeons outside of a quarantine station to the OIE in September 2011 (OIE WAHID Interface, 2011).

Taking into account the flows of population and goods with neighbouring countries, there is a major risk of importing diseases from neighbouring tropical countries with less advanced sanitary status. The sensitivity of the Australian government and stakeholders to this risk is probably linked to the fact that Australia is an island, with a high sanitary level. Therefore, surveillance and biosecurity measures at borders are very important.

The Australian states are responsible for disease control and eradication within their own boundaries. The federal level is responsible for border quarantine, national co-ordination, international trade and international consultations. In some cases, the Commonwealth can provide advice and co-ordination, and in some circumstances financial assistance for disease eradication. Each state is subdivided into veterinary regions or divisions which are under the control of a State Government Veterinary Office (SGVO). These areas are then further subdivided into either animal health districts or rural lands protection boards which are administered by inspectors who may be veterinarians or qualified animal technicians.

In each state, the SGVO is responsible for monitoring and improving the health of livestock, supervising inspectors, and administering the relevant State Government Acts. Some states have also government animal health laboratories which undertake applied research, as well as providing a disease diagnosis and investigation service.

4.1 Prevention and control system

The federal level in Australia is responsible for border quarantine, national co-ordination of animal health policy, international trade and international consultations (for example, disease reporting to the World organisation for Animal Health, OIE). The role of the Commonwealth Government in animal health is delivered primarily through the Animal Division of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF). This Division includes the Office of the Chief Veterinary Officer (OCVO), Animal Biosecurity, the Animal Health Policy Branch, and parts of the Australian Quarantine and Inspection Service (AQIS) (DAFF, 2011).

The Australian states and territory governments, with their SGVO, are responsible for animal health matters within their borders. State and Territory animal health services administer relevant acts and regulations involved in livestock identification and movement (within and between States and Territories), disease control, food safety, surveillance, etc. An animal health administrative unit headed by a veterinarian designated as the Chief Veterinary Officer (CVO) carries out these tasks in each state and territory. Government-run veterinary services in Australia involve officers from the Australian Government, state and territory governments, and local government. A system of consultative committees ensures that these three levels of government work together to serve the overall interest of Australia.

The role of governments in Australia in managing animal health is complemented by a close association between government and the livestock industries, thanks to Animal Health Australia (AHA), a not-for-profit private company whose members include the Australian Government, state and territory governments, the peak national councils of Australia's livestock industries, and various key research, veterinary and educational organisations (AHA, 2010a; AHA 2011a). The public veterinarians are focused on the co-ordination of the animal health policy, and are helped by private actors for the implementation of animal health programmes.

Risk assessment

Australia has successfully eradicated most of the major animal diseases (e.g. bovine brucellosis, bovine tuberculosis, contagious bovine pleuropneumonia, classical swine fever, equine influenza, highly pathogenic avian influenza, Newcastle disease). This is why Australian risk assessment is mainly done for pre-border risks; Biosecurity Australia, a unit of the Biosecurity Services group within the DAFF (Biosecurity Australia 2011, Beale *et al.*, 2008) is in charge of this. It undertakes risk analyses (including reviews of existing policy) to identify any quarantine risks associated with access requests to import animals, plants or their products into Australia, and recommends quarantine measures to manage these risks to an acceptably low level. If the assessed level of quarantine risk exceeds Australia's appropriate level of protection, and if no risk management measures can reduce the risk to that level, trade will not be allowed.

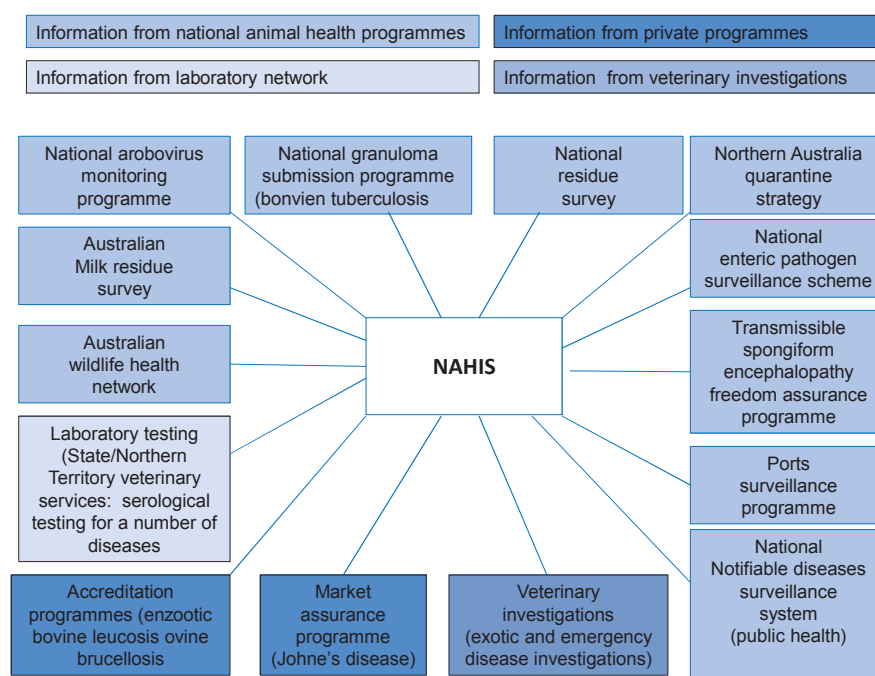
Risk analyses may be carried out by Biosecurity Australia's specialists, but may also involve relevant experts from state and territory agencies, the Commonwealth Scientific and Industrial Research organisation (CSIRO), universities and industry, in order to access the technical expertise needed for a particular analysis and ensure a scientific approach. Risk analyses are conducted across a spectrum of scientific complexity and available scientific information. An Import Risk Analysis is a type of risk analysis with key steps regulated under the Quarantine Regulations 2000. Biosecurity Australia's assessment of risk may also take the form of a non-regulated analysis of existing policy or technical advice to Australian Quarantine and Inspection Service (AQIS). Stakeholders are consulted during the risk assessment process. The risk assessment reports are public, including the information requested from the exporting country, and can be found on the Biosecurity Australia website.

Biosecurity Australia also provides considerable day-to-day advice to AQIS on biosecurity issues, including the implementation of quarantine policy and the consideration of more specific applications for import permits. It also leads and manages technical negotiations in support of Australia's market access to other countries for exports of animals, plants and their products. This enables Australia to protect its good sanitary status.

For some endemic diseases (for example, Johne's disease), government and industry have agreed on a national co-ordinated programme to reduce the risk of disease spreading between regions and individual properties. For any new programme, there is a pragmatic approach, with an initial economic analysis of the costs and benefits in which AHA and the Animal Health Committee (AHC) analyse the situation for a disease, the costs of the control measures and the expected benefit for the main partners.

For risk assessment at the border, the data used are international data from international database (for example, WAHID from the OIE), alert systems developed by some countries or group of countries (for example, the European Union, the United States), and some country data collected thanks to co-operation and exchange.

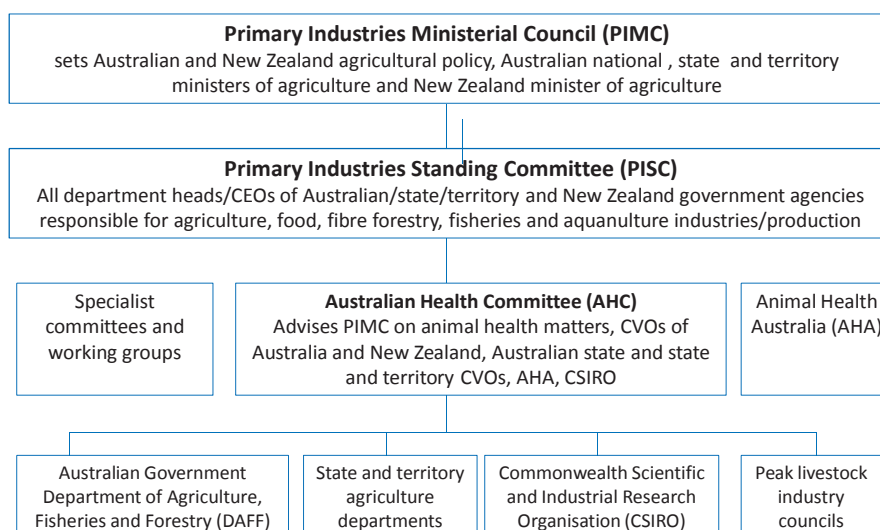
For risk assessment within the country, Australia has a powerful information tool: the National Animal Health Information System (NAHIS) (Figure 4.1), for which AHA collects data from various sources, including surveillance and monitoring programmes, diagnostic laboratories and veterinary investigations. It provides timely and accurate summary information on Australia's animal health status to support trade in animal commodities and to meet Australia's international reporting obligations. It also provides information on Australia's capabilities and activities with regard to animal disease surveillance and control and provides selected summaries of national animal health data and disease information sheets (for example, reports in the Animal Health Surveillance Quarterly newsletter) (AHA 2010a, AHA 2011a).

Figure 4.1. Organisation of the NAHIS

Decision-making

The Primary Industries Ministerial Council (PIMC) forms the main forum for developing agricultural policies that are consistent with the objectives of the Australian Government and the state and territory governments of Australia (Figure 4.2). The PIMC is the decision-making entity and is supported by a single standing committee, the Primary Industries Standing Committee (PISC). This committee comprises the chief executive officers of the relevant Australian state or territory and New Zealand government agencies responsible for policy in these areas (DAFF, 2011). New Zealand participates as an observer, due to important trade between the two countries (but there is no reciprocity: i.e. no Australian participation in an equivalent committee in New Zealand).

The Animal Health Committee is a technical committee of the PIMC and is composed of the Chief Veterinary Officers from Australia and New Zealand, the chief veterinary officers from the Australian States and territories, the AHA to represent the stakeholders, and the CSIRO Australian Animal Health Laboratory. The AHC provides the government with strategic scientific and policy advice on animal biosecurity matters through the PISC and PIMC. It prioritises and co-ordinates activities in national animal health, domestic quarantine and veterinary public health by driving the development and implementation of policy programmes, operational strategies and standards for the government. It consults with the animal industries through AHA. Cost-benefit analyses are carried out for new measures or programmes. For a new programme, the costs, benefits and beneficiaries have to be defined, in order to justify the decision. Some cost-benefit analyses are done occasionally for exotic diseases (e.g. FMD).

Figure 4.2. Committees involved in defining animal health and livestock policy

Animal Health Australia (AHA) is an innovative partnership involving government, industry and other stakeholders in animal health (Box 4.1). This company was created after the success of government-industry collaboration in the eradication programmes for bovine brucellosis and bovine tuberculosis. In this not-for-profit company 31 members collaborate, including the Australian Government, state and territory governments, livestock industry organisations, service providers and associate members. The company is funded one third by the federal level, one third by the states, and one third by the industry (core funding). For extra programmes, there are separate funding arrangements depending on the programme, with a “beneficiary pays” approach. AHA manages more than 50 national programmes on behalf of its members that improve animal and human health, biosecurity, market access, livestock welfare, productivity, and food safety and quality.

Australia participates in many international and local meetings, through its involvement in multilateral organisations and groups (WTO, the Food Safety and Animal Health Quadrilateral Forum (Australia, New Zealand, Canada and the United States), the OIE, and the Codex Alimentarius). There is also important co-operation with neighbouring countries to support animal health policy in South East Asia, especially with members of the Association of Southeast Asian Nations (ASEAN), or as a member of the Asia-Pacific Economic Cooperation (APEC). This is both a way to maintain trade with these countries, and to share information on the sanitary situation for pre-border biosecurity risk assessment. Australia and New Zealand have very close ties, because of their proximity, similar animal health status and the importance of imports/exports between the two countries.

There is no direct consultation with foreign private stakeholders trading live animal or animal products with Australia. Any consultation is organised between the CVO from the exporting countries and the CVO of Australia. Importers can have all the relevant information needed for import permit at AQIS (www.daff.gov.au/aqis/import).

**Box 4.1. Animal Health of Australia (AHA):
An original public-private partnership**

The roles of the AHA are:

- Consultation in the definition of sanitary policies.
- Co-ordination, with the definition of the different actors' role and contribution.
- Management role of some animal health programmes and of the NAHIS.
- Training, and building capacity to improve EAD preparedness

Members of Animal Health Australia

Government	Industry
The Australian Government	Australian Alpaca Association Ltd.
State and territory governments	Australian Chicken Meat Federation Inc.
Australia Capital Territory	Australian Dairy Farmers Ltd.
Northern Territory	Australian Duck Meat Association Inc.
State of New South Wales	Australian Egg Corporation Ltd.
State of Queensland	Australian Honey Bee Industry Council
State of South Australia	Australian Horse Industry Council
State of Tasmania	Australian Lot Feeders' Association Inc.
State of Victoria	Australian Pork Ltd.
State of Western Australia	Cattle Council of Australia Inc.
Associate members	Equestrian Australia Ltd.
Australian Livestock Export Corporation Ltd. (LiveCorp)	Goat Industry Council of Australia Inc.
Dairy Australia Ltd.	Harness Racing Australia
National Aquaculture Council Inc.	Sheepmeat Council of Australia Inc.
Service delivery	Wool Products Australia
Australian Veterinary Association Ltd.	
Commonwealth Scientific and industrial Research Organisation	
(CSRIO) – Australian Animal Health Laboratory	
Council of Veterinary Deans of Australian and New Zealand	

Implementation of animal health programmes

There are control and eradication programmes for some endemic diseases, such as cattle tick and tick fever, and ovine brucellosis. These programmes may either be managed by the government, by the industry with voluntary certification (for example, for caprine arthritis-encephalitis), or by both (for example, the Australian National Johne's Disease Control Programme is managed collaboratively by the livestock industries, governments and the veterinary profession). There are also some surveillance programmes for some animal diseases and/or for some species. These are managed by different institutions and organisations (for example, the National Arbovirus Monitoring Programme managed by the AHA, and the Pig Health Monitoring Scheme).

The surveillance network in Australia is based on 417 public veterinarians, 8 477 private veterinarians, and paraprofessionals and livestock producers – who will most likely be the first to notice disease (WAHID, 2011). The number of veterinarian per hectare may seem low, but there are desert areas, and farms may be very big, with well-developed means of transportation and communication which allow good surveillance and rapid response. Veterinarians are registered (provided that they meet the criteria) and must then maintain professional competence through continuous professional development in order to renew their registration annually.

Each state and territory is subdivided into veterinary regions or divisions under the control of a veterinary officer. Each region or division is further divided into animal health districts, which are administered by inspectors who may be veterinarians or qualified animal technicians. Veterinary officers located in regions supervise inspectors and administer the application of relevant state and territory acts and regulations. They also maintain records of the animal health status on farms in their region that assist in the reliable certification of animals moving within Australia and overseas.

Private veterinarians play an important role in the animal health system of Australia, as follows.

- They are an integral part of the animal disease preparedness programmes for Australia's livestock industries.
- They are involved in the Australian Veterinary Practitioner Surveillance Network, a web-based system designed to collect information about on-farm investigations by nongovernment veterinarians, complementing surveillance undertaken by jurisdictional field services.
- The Australian Veterinary Reserve comprises 100 veterinarians who are trained to immediately adapt to the conditions of an EAD incident and perform veterinary response roles (AUSVETPLAN, 2008).
- All private veterinarians are also encouraged to do some full investigations on specific diseases or disease syndromes, with the National Significant Disease Investigation Programme. Significant diseases are broadly defined as those that may affect trade or market access, farm productivity, public health or wildlife biodiversity conservation. Subsidies are available for the initial clinical evaluation and a follow-up investigation.

Pre-border biosecurity measures are developed by Biosecurity Australia, which undertakes science-based risk assessments and provides quarantine policy advice to protect Australia's animal and plant health status and natural environment. It also provides technical advice to enhance Australia's access to international markets and participate in international organisations that set biosecurity standards.

Post-border biosecurity (at farm level and within the country) is carried out by state and territory governments, livestock producers, parts of Animal Division in DAFF and through AHA's Biosecurity Programme, which draws together all projects associated to reduce the disease risks facing Australian livestock production industries. This programme is co-ordinated by AHA, and consists primarily in the implementation of auditable biosecurity standards, "freedom assurance programs", and intervention programmes such as vaccine usage and tracing/identification schemes. The National Livestock Identification System is a permanent lifetime traceability system which is an efficient tool to enable device and corresponding stock movements to be tracked, for the purposes of disease control, biosecurity, food safety, product integrity, market access and other industry-related purposes.

For biosecurity at farm level, AHA and Plant Health Australia (PHA) have developed an educational and engagement campaign ("Farm Biosecurity"), to help producers to reduce the risk of diseases, pests and weeds. It provides information about farm biosecurity and the prevention of emergency animal disease, encouraging producers to identify risks to their livestock and to minimise these risks through good practices (www.farmbiosecurity.com.au/).

The cost-sharing for emergency animal disease responses is established and well defined. The industry is very well informed about the cost-sharing mechanism. According to a categorisation of the emergency animal diseases, the costs of the diseases are shared between the government (state and/or federal level) and the industry (Box 4.3).

Box 4.3. Levies for private contributions on animal health policy

Why there is a levy

A levy is payable on transactions involving livestock (defined to include sheep, lambs and goats) and/or cattle (defined as bovine animals other than buffalo – there are separate levies on buffalo, deer and pigs). The levy is paid by the trader or the slaughterhouses purchasing the animals. Components of the levy are used to fund: research, development and marketing activities through Meat and Livestock Australia (MLA) (www.mla.com.au), programmes conducted by Animal Health Australia (AHA) (www.animalhealthaustralia.com.au), plus contributions to the National Residue Survey (www.daff.gov.au/nrs). The Levies Revenue Service (LRS) receives the funds and forwards them to the relevant organisations, in addition to distributing the Australian Government's matching research and development (R&D) contributions. Levies are introduced and administered by the Australian Government at the request of Industry.

Examples of amount of transaction levy

- Cattle (grass fed) AUD 5.00 per head
- Lot-fed cattle (grain fed) AUD 5.00 per head
- Bobby calves AUD 0.90 per head
- Sheep: 2% of sale price (to a maximum of AUD 0.20 per head)
- Lambs: 2% of sale price (to a maximum of AUD 1.50 per head)

The annual total funding available is around AUD 103 million.

Activities funded by levies include R&D, marketing and promotion, plant and animal health programmes and residue testing. See www.daff.gov.au/agriculture-food/levies/industry, accessed 23 February 2012.

When there is an outbreak of an emergency disease, the state and the federal governments pay for the disease response. The federal government initially underwrites the industry share of the costs. Then the concerned industry has to reimburse its share. The industry payment mechanism is usually via a levy. These levies are collected on trade of live animals, and on slaughtered animals to contribute to animal health programmes and to reimburse the federal government.

To avoid a too-heavy contribution for an emergency animal disease response that could jeopardise the competitiveness of the animal sectors, the economic contribution of the parties is limited to a maximum of 1% of the sector's GDP (2% for FMD). Before a response can exceed the applicable GDP limit, the parties (state and federal governments and affected industries) must agree to continue the response and to pay the extra costs according to the agreed percentages described in the Emergency Animal Disease Response Agreement (EADRA).

Outbreak management

Outbreaks are managed according to the Emergency Animal Disease Response Agreement (EADRA), which is a formal, legally binding agreement between Animal Health Australia, the Australian government, all state and territory governments, and currently fourteen livestock industry signatories ("Parties"). The EADRA covers the management and funding of responses to Emergency Animal Disease (EAD) incidents. One of the key AHA functions is to manage the EADRA on behalf of its members, to ensure that the Australian animal health system is well prepared in the event of emergency animal disease outbreaks. The agreement establishes basic operating principles and guidelines, and defines roles and responsibilities. It includes provision for formal consultation and dispute resolution between government and industry on resource allocation, funding, training and risk management, and ongoing biosecurity arrangements.

The signatories to EADRA are committed to:

- minimising the risk of EAD incursions by developing and implementing biosecurity plans for their jurisdictions or industries
- maintaining an appropriate capacity to respond to an EAD by having available adequate numbers of trained personnel to fill roles specified in AUSVETPLAN (see below)
- participating in decision-making relating to EAD Response Plans (EADRP) following the process of approval and EAD response described in Box 4.4.
- sharing the eligible response costs of EAD incursions.

The other key documentation for emergency animal disease responses is AUSVETPLAN – the Australian Veterinary Emergency Plan. AUSVETPLAN is a series of documents that are agreed in advance of an outbreak through a national consultation process involving governments and industry. The plans cover specific disease policies, information about emergency management, and practical information on a wide range of topics such as disinfection, carcass disposal, and management of enterprises such as zoos. Together, the EADRA and AUSVETPLAN provide a suite of agreed policies and procedures, including roles and responsibilities, and cost-sharing arrangements, which facilitate a rapid and effective response to animal disease outbreaks in Australia.

The National Animal Health Performance Standards developed by Animal Health Australia is a means of assessing national capability, driving improvements in performance and ensuring that available resources are deployed to address matters of greatest risk or opportunity. This tool is used to assess official Veterinary Services (state or federal), and the industry, and to ensure that the government and livestock industry members of AHA respect and are compliant with the standards. These standards define the role of each partner (federal agencies, state veterinary services, animal products sectors) and the needed requirements to be fulfilled by each actor. Feed-back on the results is sent to the AHC, the PISC and the PIMC. The member concerned must correct any weakness identified. The evaluation is assessed on nine capabilities for six functions (Table 4.1) for which Government's measures are different from livestock industry's measures.

To assess the efficiency of the control measures or the relevance of biosecurity measures, some cost-benefit analyses are done for specific programmes (for example, for Foot and Mouth Disease). However, this is done only on specific request.

Box 4.4. Elaboration of an Emergency Animal Disease Response Plan (EADRP)

An Emergency Animal Disease (EAD) Response Plan is developed by the state or territory chief veterinary officer(s) in whose jurisdiction(s) the EAD incident has occurred. The EAD Response Plan must be prepared in accordance with a specific schedule in the Emergency Animal Disease Response Agreement and follow certain principles, including (but not limited to) the following:

- the EAD Response Plan development and approval process must not impede the initiation of a rapid response to an outbreak of an EAD
- the EAD Response Plan must clearly identify any proposed significant variations to AUSVETPLAN
- any key strategies and core operational activities that are to be the subject of cost sharing must be clearly identified in the EAD Response Plan.

Once agreed by the National Management Group (NMG), the EAD Response Plan will commit the state or territory agency/ies to the key strategies and core operational activities contained in the Plan.

The EAD Response Plan must be endorsed by the Consultative Committee on Emergency Animal Diseases (CCEAD, a committee of technical representatives of the Parties) before being submitted to the NMG (a higher-level group representing each of the Affected Parties). The NMG will approve, or not approve, the invoking of cost-sharing and manage, on behalf of the Affected Parties, the national policy and resourcing needs of the EAD Response Plan. The CCEAD is responsible for technical co-ordination of an EAD response. The Committee is chaired by the Australian CVO or delegate, and comprises the state and territory CVOs, the Director of the CSIRO Australian Animal Health Laboratory, members from Biosecurity Australia and the Australian Quarantine and Inspection Service (AQIS), and technical representatives from relevant industries. Industry representatives comprise one nominee agreed by all industry parties, and one nominee from each of the affected industries. AHA attends CCEAD meetings as an observer. To ensure the most timely and effective response, the CCEAD oversees implementation of EADRP, strategy development and planning, and the development of technical policy. The CCEAD provides advice to a NMG that is established for each incident. The Secretary of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) chairs the NMG, and members are chief executives of the state and territory agriculture or primary industries departments, and chief executives from each affected industry.

Table 4.1. Structure of the National Animal Health Performance Standards

Six functions	Nine capabilities								
Consumer protection	Policy development	Management	Service capability/capacity	Information management	Livestock tracing	Training	Communication	R&D	Legal and regulation
Trade and market access									
Disease surveillance									
Endemic disease management									
Emergency preparedness and response									
Livestock welfare									

4.2. Compensation schemes and incentives

The Commonwealth Government, in partnership with state/territory governments and livestock industry organisations, approaches compensation for direct losses arising from disease outbreaks and control measures through the Emergency Animal Disease Response Agreement (EADRA). The EADRA specifically disallows compensation for stakeholders' consequential losses. More broadly, compensation is directed by the principle that “no one person or organisation is made better or worse off as a result of reporting a disease incident...” The public-private cost-sharing nature of the EADRA is represented by a second framework principle, namely that the beneficiaries of disease control efforts pay “an appropriate and equitable” share of the response costs (AHA, 2011a, p.1).

Regarding private insurance for livestock disease risks, Neumann and Keogh (2006, pp. 156, 157) wrote that, due to the low frequency of outbreaks, prohibitive costs, and the extent of expenses that a holder would need to cover before receiving claim payment, “insuring livestock against the risks of animal diseases is not widely practised [in Australia] and few major agricultural insurers have “off-the-shelf” products for this type of risk.”³ These observations were supported by an AHA official who suggested in August 2011 that, if such insurance is available, it is not widely held by livestock owners.

Institutional framework

The EADRA rests on a public-private partnership with respect to both its governance and funding. It is a legally binding agreement between the Commonwealth Government, Australian state and territory governments, 14 organisations representing the livestock industry, and the not-for-profit public company Animal Health Australia (see Table 4.2 for the full list of signatories). This public-private partnership in emergency animal disease risk management thus has a formal legal basis; it can also be seen in the *de facto* organisational compositions of the main stakeholders.

Table 4.2. Parties to the Emergency Animal Disease Response Agreement (EADRA)

Public company	Governments	Livestock industry sectors
Animal Health Australia	- Commonwealth of Australia - States of Queensland, New South Wales, Victoria, South Australia, Tasmania, and Western Australia - Northern Territory of Australia and the Australian Capital Territory	- Australian Chicken Meat Federation Inc. - Australian Egg Corporation Limited - Australian Dairy Farmers Limited - Cattle Council of Australia Inc. - Australian Pork Limited - Sheepmeat Council of Australia Inc. - Woolproducers Australia - Australian Lot Feeders' Association Inc. - Goat Industry Council of Australia - Australian Honey Bee Industry Council Inc. - Australian Racing Board Limited - Harness Racing Australia Inc. - Australian Horse Industry Council - Equestrian Australia Limited

Source: Animal Health Australia (2011a, pp. 2, 3).

The custodial organisation for the EADRA is Animal Health Australia (AHA),⁴ which was established under Australian corporation law in 1996.⁵ Though the EADRA was not ratified until 2002, its development was one of the factors underlying AHA's establishment. Custodianship of the EADRA entails, among other efforts, a continuous performance review process involving annual workshops attended by all the EADRA signatories⁶ and a comprehensive review every five years (2007, 2012, etc.).

Following an outbreak-prompted invoking of the EADRA's cost-sharing mechanism, AHA moves from maintenance of the EADRA to an administrative role. It collects technical data on the emergency disease response, assesses and processes reimbursement claims made by the eligible stakeholders, determines the amounts owed by the applicable parties (the government parties and those industry sectors which benefited from the response effort), and conducts a final audit of the control costs (sharable and non-sharable).

The National Management Group (NMG) is the stakeholder authorised to actually invoke the EADRA – via consensus approval of a proposed Emergency Animal Disease Response Plan (EADRP; hereafter, “disease response plan”). This approval activates the agreement's cost-sharing mechanism. The National Management Group is chaired by the Secretary of the Commonwealth Department of Agriculture, Fisheries and Forestry. Its membership includes the chief executive officers of the state and territory governments; the president or equivalent officer of each of the relevant industry parties; and, with observer status, Animal Health Australia. Under the principle that those who finance emergency animal disease response costs should be present when spending decisions are taken, the industry representation to the National Management Group varies according to which industry sectors are affected by a disease incident.⁷

The decision on whether to approve a disease response plan is informed by the concurrent work of the Consultative Committee on Emergency Animal Diseases (CCEAD). In comparison to the management-oriented NMG, the CCEAD is a more technical body. Its decision-making focuses on the technical feasibility of disease response plans rather than financial cost-benefit analyses and its members include the chief veterinary officers of the Commonwealth and the states/territories; representatives from the Australian Animal Health Laboratory, Australian Quarantine and Inspection Service, Biosecurity Australia, and (with observer status) Animal Health Australia; and members of relevant industry parties (normally, one member represents a non-affected industry). In the early stages of a disease incident, the CCEAD is responsible for reviewing the disease response plan put forward by the chief veterinary officer(s) of the affected state(s)/territory(s). An appraisal of whether the disease can be eradicated or controlled and a recommendation on the appropriateness of the disease response plan – essentially on whether the EADRA should be invoked – are forwarded to the NMG.

Though both the CCEAD and the NMG must arrive at their decisions through consensus, the process is fraught with significantly less tension than might be expected. This appears primarily a result of 1) the absence of much need or motivation to engage in last-minute financial negotiations, because all cost-sharing formulae, down to the percentages payable by different industry sectors simultaneously affected by one disease, are specified and consented to via the EADRA; and 2) the existence of the Australian Veterinary Emergency Plan (AUSVETPLAN) which specifies pre-developed response strategies for the 65 EADRA-listed diseases. Since AUSVETPLAN documents were collaboratively developed in “peace-time” with the industries potentially affected by the diseases, consensus on response measures has effectively been established. The result is a limited likelihood that consensus cannot be reached within the CCEAD or the NMG.

The livestock industry parties also operate with EADRA-derived responsibilities. The EADRA specifies that industry parties must “take reasonable steps to advise their members

and other participants ... to notify the applicable authority within 24 hours of becoming aware of an incident...” Additionally, a state/territory may forfeit its claim to cost-sharing payments through failure to formally notify the CCEAD of an incident within 24 hours (AHA, 2010, p. 14 of the EADRA Deed).⁸ As a result of these clauses, livestock holders are likely pushed toward early reporting by both industry parties and states/territories. For this purpose, the latter group may use state/territory-level legislative reporting requirements.

Industry parties also commit to development of sector-specific biosecurity plans and an annual Animal Health Australia review of associated progress (EADRA, 2010, p.14 of the Deed). The focus of this programme “is the development of individual [one-to-two page] on-farm biosecurity plans” to reduce the probability of disease outbreak and spread (Keogh and Neumann, 2006, p.155).

Compensation practices

Cost-sharing under the EADRA applies to several types of expenses (AHA, 2010, p.19 of the EADRA Deed) salaries and wages; operating expenses; capital costs; and (livestock holder) compensation.

Accordingly, in discussing EADRA-based cost-sharing and coverage of losses, it is helpful to distinguish between (i) compensation of livestock holders’ direct losses (the fourth point above) and (ii) the three other expense types (first to third points above) which mainly relate to payment of “compensation-like” reimbursement for expenses incurred by stakeholders such as the Lead Agencies (i.e. the disease-response-plan-implementing department/agency of each affected state/territory) and AHA during a disease response.⁹

First, with respect to the cost-sharing payments for salaries and wages, operating expenses, and capital costs,¹⁰ the sharing-eligible expenses are those costs which result directly from disease response plan implementation and exceed the implementing agencies’ “normal commitments”, which serve as the baseline “above which other costs are to be shared” (AHA, 2010, p. 2). Thus, neither routine biosecurity expenses nor consequential losses incurred by communities within affected states/territories are cost-shared.

Turning to compensation, the eligible stakeholders are owners of livestock or property destroyed in an effort to eradicate or stop the spread of an emergency animal disease, as well as owners of livestock that, had they not already died of the disease, would have been ordered slaughtered. Compensation for dead animals is conditioned on inspector certification of the cause of death and its timely reporting. Additionally, the applicable chief veterinary officer must indicate that the animals would have been among those compulsorily slaughtered (AHA, 2010, p. 29 of the EADRA Deed). Compensation eligibility also generally requires that a livestock owner be represented by one of the 14 industry organisations that are EADRA signatories. Exception is made for industry sectors with gross value of production (GVP) less than AUD 20 million (AHA, 2010, p.21 of the EADRA Deed).

That livestock holders’ outbreak-induced consequential losses are not eligible for compensation is made explicitly clear (AHA, 2010, p. 30 of the EADRA Schedules): “no allowance shall be made for loss of profit, loss occasioned by breach of contract, loss of production or any other consequential loss whatsoever...”¹¹

For destroyed property, the relevant value is that assessed immediately prior to destruction. Meanwhile, compensation payments to livestock holders, which are first made by state/territory governments and later claimed as cost-sharing expenses, comprise either a one- or two-step process. In the first step, the market value of the destroyed and dead-as-a-result-of-the-disease animal(s) is indemnified. This value is calculated on the basis of the farm-gate price, i.e. on a sale of the animal(s) at the location of destruction or death, on the earliest-occurring of three dates: 1) owner reportage of the relevant disease; 2) detection of the disease

by an accredited inspector; or 3) imposition of quarantine measures. When applicable, a second, top-up payment compensates for the difference between the market value of the equivalent replacement livestock on the date the property becomes eligible for restocking and the compensation amount previously paid. In a sense, then, the maximum compensation level is the market value of a herd restocking. This attempts to adhere to the principle that no one should be made better or worse off as a result of reporting a disease incident.¹²

In addition to the aforementioned requirement that livestock holders rapidly report a disease incident, there are also timeframes within which claims for compensation must be made.¹³ The initial claim must follow livestock destruction or death by not more than 90 days, a request for a valuation of restocking costs must be transmitted within 30 days of notification of restocking eligibility, and a claim for a second compensation payment must be made within 21 days of receipt of the second valuation's results.

The EADRA (2010) does not distinguish between compensation in cases of “limited” and “catastrophic” outbreaks. In theory, the possibility of *ad hoc* compensation, which would likely only be distributed in severe cases (Box 4.5), does entail potential differentiation between limited and large-scale epidemics. However, the EADRA's coverage of a high number of diseases and the now near-complete representation of the livestock industry sectors among the signatories significantly decreases this potential.

The EADRA's predecessor, the Commonwealth/States Cost Sharing Agreement, applied to only 12 livestock diseases and did not provide for industry contributions (Neumann and Keogh, 2006, p. 150); therefore, with its portfolio of 65 emergency animal diseases,¹⁴ the EADRA provides significantly more certainty for disease response planning and funding. As seen in Table 4.3, diseases listed in the EADRA are divided into four categories based on several factors, including their potential to cause national socio-economic losses, human or environmental health consequences, and adverse economic effects for the livestock industry. Perhaps the most easily traceable logic linking the categories and the percentage-based cost-sharing splits between government and industry parties is a given disease's ability to impact on human or environmental health.

In order for a livestock disease to be considered for inclusion in the EADRA, it must meet one of the following conditions (AHA, 2010, p. 8 of the EADRA Deed):

- It is a known disease that does not occur in endemic form in Australia and it is felt to be in the national interest to keep the country free of the disease;
- It is a conclusively identifiable variant form of an endemic disease and would have a national impact if it became established in Australia;
- It is a serious infectious disease whose cause is unknown or uncertain – based on the evidence available at the time, it may be an entirely new disease or one not listed in the EADRA;
- It is a known endemic disease, but its form during the outbreak in question is so severe that an emergency response is required to prevent a large scale epidemic of national significance or large-scale loss of market access.

Since ratification of the EADRA in 2002, only two diseases have been added; additionally, bovine tuberculosis was recently moved from Category 3 to Category 4, increasing the industry contribution for this disease to 80% of sharing-eligible expenses. A consensus has emerged among the EADRA parties that, rather than conduct comprehensive list reviews, they will examine potential changes on a case-by-case basis.

Financial structure

Following the National Management Group's approval of a disease response plan, each participating Lead (state/territory) Agency initially pays its own response implementation costs. Then the cost-sharing formulae in the EADRA are utilised to calculate reimbursement payments which are made "on a monthly basis or such other time as agreed to by NMG [the National Management Group] on submission of claims to, and their verification by, AHA" (AHA, 2010, p. 1).

As previously indicated (and shown in Table 4.4), the levels of government and industry cost-sharing burdens vary by disease category. Costs sustained by industry parties range from 0% for Category 1 emergency animal diseases – those with the most potential to negatively affect human or environmental health – to 80% for Category 4 emergency animal diseases. Government parties cumulatively pay at least 20% of disease response costs and cover the entirety of expenses resulting from Category 1 diseases. The Commonwealth Government always pays 50% of the overall government share, with the rest subdivided among the states/territories according to – for Category 1 diseases – their relative human populations, or – for the other diseases – their relative populations of the livestock species in question, their share (as a percentage of the national total) of the gross value of production (GVP) of the affected species and/or animal products, or a combination of the two (EADRA, 2010, pp. 20–23). These methods effectively distribute the government cost-sharing burden such that those states/territories which pay the most for a certain disease response benefit more than the others from it, i.e. they have relatively large shares of the potentially affected human population or of the GVP of the affected industries in their jurisdiction.

Cost-sharing among the industry parties (relevant for Category 2, 3, and 4 diseases) needs to be calculated when an emergency animal disease affects more than one species or concerns more than one industry party. If a disease affects more than one species, the cost-sharing contributions of the affected industry parties are based on their comparative GVP and a weighting which reflects the emergency animal disease's impact on each of them. For example, the weighting factor for foot-and-mouth disease is 50% cattle, 30% sheep and goats, and 20% pigs. In the other instance – multiple industry parties representing a single affected species (e.g. beef grazing, beef feedlot, and dairy) – the cost-sharing is determined among the affected parties, but should take into account the GVP of the respective individual sectors (EADRA, 2010, pp. 26, 27). If such industry parties do not notify their preferred division of costs to AHA, each will be equally financially responsible.

Box 4.5. The 2007 equine influenza outbreak: *Ad hoc* government funding of the industry's share of costs

Animal Health Australia (AHA) has noted the possibility of "occasional exceptions" to the general provision on compensation eligibility which maintains that industries which account for GVP greater than AUD 20 million and are "not represented by an EADRA signatory are not eligible for compensation" (AHA, 2011a, p. 11).¹ One such exception occurred following the August 2007 equine influenza outbreak, when the Australian government resorted to *ad hoc* response cost underwriting and compensation for direct and consequential losses.

Though equine influenza is among the 65 EADRA-listed diseases, at the time of the outbreak the affected equine industry sectors had not yet signed onto the EADRA. Accordingly, the cost-sharing mechanism was not officially invoked during the course of the response. Nonetheless, the cost-sharing procedures were essentially applied, with the key break in prescribed procedure being that the Commonwealth Government ultimately underwrote the industry's share of the response costs² and made substantial support payments to various affected stakeholders.³ Since control measures did not involve the culling of animals,⁴ the impetus for the support payments originated in the implementation of a national livestock standstill and subsequent movement restriction and control zones in infected states which caused large-scale income losses among, e.g. the horse racing industry and third-party stakeholders like equine dentists temporarily put out of work by the threat of disease transmission.

**Box 4.5. The 2007 equine influenza outbreak:
Ad hoc government funding of the industry's share of costs (continued)**

There are two notable characteristics of the equine influenza outbreak which may have affected the Commonwealth Government's decision to cover the industry's share of the response costs. First, the outbreak was "abnormal" to some extent because it originated with imported horses and likely passed through import-associated quarantine measures on the body of a person or equipment that had been in contact with the sequestered animals (Callinan, 2008, pp. xvi, xvii). Second, the horse industry had expressed an intention to become an EADRA signatory prior to the outbreak but progress was delayed in part by the requisite development of an equitable, efficient, and regulation-meeting⁵ levy system through which to fund the industry's potential cost-sharing responsibilities. Levy design has proven particularly challenging in the case of the equine industry, even after the influenza outbreak, since Australian horse owners do not deliver an easily/directly taxable "product" in the same sense as, for example, pork or egg producers.⁶

One outcome of the 2007 equine influenza outbreak, which ultimately led to a reported 8 000 infected properties and saw per-day control costs reach AUD 560 000 (Callinan, 2008, pp. 10, 11),⁷ was to provide clear motives for pursuing comprehensive representation of the livestock industry amongst the EADRA parties. To that end, Primary Industries Ministers from both the Commonwealth and the states and territories agreed to the need to establish by 1 December 2010 horse industry commitment to a national levy and to inclusion of the industry under the EADRA. In the absence of any funding agreement, Ministers agreed that there would be no nationally cost shared response to any exotic horse disease incursion. Should the horse industry come forward with the necessary agreements, the Commonwealth Government would commit to introduce legislation accordingly. Ministers agreed to work with horse industry organisations in all jurisdictions and members of the Australian Parliaments to ensure broad support for timely progression of the funding legislation.⁸ The horse industry met the December 2010 deadline and submitted a comprehensive dossier to the Commonwealth Minister. By March 2011, the equine industry had formalised its commitment to the EADRA (AHA, 2011c).

1. The relevant clause of the EADRA is 10.8, which reads in full, "The Parties agree that it is their intent that, once appropriate legislative provisions are agreed, participants in Industries the representative bodies for which are not Parties to this Deed, and the GVP of which is greater than AUD 20 million, will not be eligible for compensation. It is the intention of the Parties that Industries the GVP of which is less than AUD 20 million may be eligible for compensation" (AHA, 2010, p. 21 of the EADRA Deed).

2. Equine influenza is a Category 4 disease which means that had the industry already been a signatory to the EADRA its contribution would have been 80% of the sharing-eligible response costs (EADRA, 2010, p. 21 of the Deed, pp. 8-10 of the Schedules). However, given the high cost of the control measures in this case, the industry's contribution would have been limited by the 1% of industry GVP cap provided for in the EADRA. Indeed, during the course of the outbreak the EADRA parties agreed to raise the cap to 2% of industry GVP (AUD 64 million) and once this limit was reached (January 2008) a final, upper limit of AUD 108 million was agreed (Callinan, 2008, p. 11).

3. The sum of these compensation-like payments committed to by the Commonwealth Government was AUD 268.8 million. They were provided "directly to individuals and businesses whose primary source of income had been affected by the outbreak and the subsequent movement restrictions" (Callinan, 2008, p. 12).

4. For a description of the control measures taken, see Callinan (2008, pp. 10, 11) or Cowled *et al.* (2009, pp. 60, 61).

5. That is, the Commonwealth Government's Levy Collection Guidelines.

6. The equine industry – represented by the Australian Racing Board, Harness Racing Australia, Australian Horse Industry Council, and Equestrian Australia Limited – signed onto the EADRA in March 2011. The industry-supported levy provisions are zero-based (i.e. only activated when necessary) levies on manufactured horse feed and anthelmintics (worm treatments). The *Horse Disease Response Levy Bills* were recently passed by the Senate in September 2011, this being the final step that establishes the necessary cost recovery mechanism that enables the horse industry to collect its share of the costs for a response as of now.

7. Per-day forgone income peaked at AUD 3.35 million (Callinan, 2008, p. 11).

8. www.mincos.gov.au/__data/assets/pdf_file/0005/1608971/pimc17.pdf.

Table 4.3. Cost-sharing proportions by disease category

Disease category	Category characteristics	Government funding*	Industry funding	Applicable emergency animal diseases	
				Total number	Indicative, abbreviated emergency animal disease lists
Category 1	“Predominantly seriously” impact human health or the environment, with few direct consequences for livestock industries	100%	0%	5	Australian bat lyssavirus Nipah virus Western, Eastern, and Venezuelan equine encephalomyelitis Japanese encephalitis Rabies
Category 2	May cause “slightly lower” national socio-economic losses than Category 1 but result in “very severe” production losses and still produce “significant” human or environmental consequences	80%	20%	16	Avian influenza (highly pathogenic, subtypes H5, H7) Foot-and-mouth disease Sheep pox Bovine spongiform encephalopathy <i>Peste des petits ruminants</i> Vesicular stomatitis
Category 3	Lead to “generally moderate” national socio-economic losses, including severe production losses for the industry, with little to no effect on human or environmental health	50%	50%	16	Avian influenza (highly pathogenic, other than subtypes H5, H7; and low pathogenic, subtypes H5, H7) Classical and African swine fever Scrapie Bluetongue (in sheep) Newcastle disease Swine vesicular disease
Category 4	Primarily prompt production losses for the livestock industries, which are in turn the main beneficiaries of the outbreak responses	20%	80%	28	Aujeszky's disease Equine influenza Maedi-visna virus Bovine tuberculosis Heartwater PRRS
Uncategorised**	Treated, with respect to cost-sharing, as Category 1 if a previously unknown disease, and as Category 3 if a previously known but not categorised disease***	100% Or 50%	0% 50%	n.a.	n.a.

* “Government” refers to the cumulative share paid by the Commonwealth government and state/territory government(s).

** In order for the uncategorised emergency animal disease cost-sharing rules to take effect, the National Management Group must decide to implement a disease response plan) prior to the categorisation of a previously unknown or known-but-not-categorised emergency animal disease.

*** With respect to “uncategorised” diseases which would generally be classified as Category 3 for cost-sharing, if the National Management Group agrees that such a disease entails “significant” public health issues it will be dealt with as a Category 1 disease.

Source: Animal Health Australia (2011a); AHA (2010, p. 19 of the EADRA Deed, pp. 8-10 of the EADRA Schedules).

Also of prime significance is a GVP-based cap on the total cost-sharable response costs to assure parties that the cost of a disease response plan will be finite. Relevant for larger-scale incidents, this cap initially limits the total of the response costs that are to be shared to 1% of the GVP of the industry(s) affected (2% in the case of foot-and-mouth disease). When there is reason to believe that the cost of the disease response plan may exceed the agreed limit, the National Management Group reviews the disease response plan to address several questions (AHA, 2010, p. 20 of the EADRA Deed):

- Should the agreed limit be increased?
- Should the disease response plan be continued or substituted by a long-term control plan?
- Should the proportional shares of the affected parties be altered?
- Or, should any other appropriate alterations be made to the disease response plan?

To achieve the ability to meet their potential cost-sharing obligations, the industry EADRA parties are required to develop fundraising mechanisms. Overwhelmingly, they have elected to implement statutory levies that are zero-based, i.e. only activated following a relevant emergency animal disease incident (AHA, 2010, p. 33 of the EADRA Schedules).¹⁵ When necessary, the Commonwealth Government will initially absorb the industry share of costs and allow the affected industry(s) up to ten years to finalise reimbursement at an interest rate based on the Australian Consumer Price Index.

Given the industry parties' preference for zero-based levies, cost-sharing contributions are primarily *ex post* in nature. Nonetheless, there are several "peace-time" undertakings related to the EADRA, including the aforementioned annual workshops, as well as mandated training programmes, which necessitate *ex ante* financing. These "peace-time" costs related to maintenance of the EADRA are – in a distinct cost-sharing scheme – distributed equally among the Commonwealth Government, the state/territory governments, and the livestock industry's full AHA members (even if those members are not signatories to the EADRA).

Outbreaks and practical experiences

In assessing how the compensation component, and more broadly the EADRA cost-sharing mechanism, has functioned since ratification in 2002, it is worth considering that though the EADRA has been updated almost annually, it has undergone no fundamental changes. Indeed, the minor, clarification-type modifications adopted have resulted from the realisation, through actual application of the EADRA, that some of the agreement's clauses could be more clearly structured.¹⁶ An AHA official has suggested that this absence of a push for wholesale change is linked to stakeholders' general sense that the EADRA is a solid, well-functioning agreement which reflects a high level of consensus among all the signatories.

Alongside the relatively minor changes made to the EADRA during the decade it has been in operation, there have been few major, compensation-triggering outbreaks. Therefore, Table 4.4 below highlights just the 2002 Newcastle disease outbreak, one of the first for which the EADRA-based cost-sharing was invoked, and the 2007 outbreak of equine influenza due to its status as the most substantial disease eradication effort since the development of the EADRA.

Table 4.4. Recent major outbreaks prompting compensation payments

Disease	Time period	Scope of outbreak and compensation	Subsequent modifications to scheme (if any)
Newcastle Disease	2002	Two outbreaks, 10 000 cases, 1 000 deaths; 265 619 birds destroyed, 47 000 slaughtered, and 230 000 vaccinated. Total shared costs: AUD 1.91 million in the Victoria incident, and AUD 432 000 in the New South Wales incident.	No known significant post-incident modifications to the EADRA (the disease was successfully eradicated according to AUSVETPLAN strategies)
Equine influenza	2007	Large-scale: this was the “first major cross-jurisdiction incident since [EADRA’s] inception” (AHA, 2008, p.5), and the most serious livestock disease experienced in recent Australian history. Approximately 47 000 horses on 5 943 properties were infected in New South Wales alone. Costs during the initial response reached AUD 560 000 per day for disease control and total sharing-eligible costs for equine influenza in New South Wales and Queensland were just over AUD 100 million.	Led to heightened efforts to increase industry participation in the EADRA and ultimately to the finalisation of arrangements which will allow the horse industry to pay their share of disease response costs in future events.

Source: AHA (2008, p. 5); Callinan (2008, pp. 11-12); New South Wales Government (2008); OIE HandiSTATUS Interface (2011); OIE WAHID Interface (2011).

The motivations and duties that the EADRA imposes on livestock holders with respect to 1) biosecurity, 2) notification of outbreaks, and 3) co-operation with disease response plans suggest that all the main potential incentives related to livestock holder compensation have been taken into account.

First, with respect to the development of robust biosecurity, rather than promote it through direct financial means, e.g. by decreasing individual livestock holders’ levies in exchange for their agreement to adhere to heightened preventive measures,¹⁷ the EADRA requires it through risk-mitigation regulations contained in Clause 14. In this way, any moral hazard issues that might otherwise emerge from the 100% and 80% government coverage of the sharing-eligible response costs for Category 1 and Category 2 diseases, respectively, are counteracted through regulation. Additionally, Category 3 and Category 4 diseases do call for a substantial proportion of their costs to be borne by the livestock industry.

The largely *ex post* nature of the EADRA-related levy systems employed by the livestock industries may eliminate some potential for awareness-raising with respect to the animal health responsibilities of livestock holders.¹⁸ But, since ratification of the EADRA, Animal Health Australia has engaged in a substantial and still ongoing communication campaign to increase awareness and understanding of the EADRA and its risk mitigation regulations among stakeholders (Bernoth, 2011; Neumann and Keogh, 2006, p. 155).

Second, the EADRA forgoes a potential direct financial incentive for early notification in that it does not reduce compensation levels for animals dead or visibly sick at the time a disease incident is reported – compensation for animals dead from the applicable disease is set at the same level as compensation for culled animals. However, the incentive for early reporting is provided in another manner: to receive this full compensation for dead animals, livestock holders must notify authorities of the death(s) within 24 hours.

Third, in terms of incentivising the full co-operation of livestock holders, and more broadly the livestock industry, with disease response plans, there are a couple of particularly relevant aspects of the EADRA. The top-up compensation payment which adjusts for the difference between the initial market value-based compensation of livestock holders' dead or culled animals and the subsequently assessed market value of equivalent livestock restocking goes a long way towards ensuring business continuity, and thus likely provides a strong incentive for holders' general co-operation with the EADRA. More broadly, this top-up compensation payment embodies the general principle that no individual or organisation should be made worse off as a result of reporting a disease incident, which seems an important incentive for stakeholders' participation in and co-operation with disease response plans. Similarly, the fact that all stakeholders, including industry organisations, take part in decision-making when they are affected by a disease incident also works to ensure general involvement and co-operation in response efforts.

If there is a potentially adverse compensation-related incentive not comprehensively addressed in the EADRA, it is the comparative loss experienced by a livestock owner whose farm is in a movement restriction zone. This owner, unlike another whose nearby farm is inside the infected or culling zone, would not receive compensation for business interruption losses experienced as a result of the movement restriction – because those constitute consequential losses – yet would still bear the financial burden of feeding and caring for alive livestock. Thus, through co-operation with the movement restriction regulations, the first owner is put at a financial disadvantage relative to the second (who is cooperating with the culling measures). The EADRA does, however, attempt to greatly limit the extent of this issue by ensuring rapid outbreak responses which can decrease the duration and scope of control measures like restriction zones. Also, AUSVETPLAN disease strategies take into account business continuity and require that restricted areas (RAs) should be no larger than required for epidemiological reasons to prevent spread of infection. RAs should not be extended merely to include processing establishments (e.g. abattoirs, dairy factories) or disposal sites, or to accommodate simple boundary definitions (e.g. local government areas). Minimising the size of the RA reduces the number of farms under the most stringent controls. This enables resources to be allocated to the highest priorities and minimise impediments, including social impacts, to farming and regional communities.

With respect to the discussion of potentially adverse incentives, it is noteworthy that an AHA official reported that the company has not experienced any associated poor behaviour, e.g. a failure to report a disease incident. The livestock industry's adherence to the agreement has reportedly been firm. This positive experience is likely in part an outcome of the collaborative nature of the EADRA: through involvement of all relevant stakeholders in not only the funding but also administration of the cost-sharing scheme, a strong and cross-sector commitment to its proper functioning may be established.

4.3 Concluding remarks

The animal health context of Australia is specific, being an island with a good sanitary situation. The consensus on the animal health policy is on the importance of avoiding any introduction of new disease and eradication, and in most situations, that the best approach is to block the pathogen outside the country's borders.

AHA is an interesting example of public-private partnership involving the industry in the co-ordination and financing of the animal health policy. One of the most significant results of this high level of consultation is the definition of the rules for cost-sharing between the public authorities and the animal products sectors. In practice, four categories of disease have been defined, each with specific funding shares. To avoid funding problems, the federal

government has committed itself to advance the funds for immediate control measures in case of outbreaks.

To manage the main outbreaks, the different parties (public and private) have signed the EADRA agreement. Each State or territory has to define EAD response plans involving and co-ordinating the different partners. These plans are validated at national level by co-ordinating committees. This shows that the operational responsibility is for the state and territory governments under the co-ordination of the federal Veterinary Services.

In so far as compensation is concerned (Table 4.5), the Emergency Animal Disease Response Agreement (EADRA) is seen by Animal Health Australia in two ways. It is a risk-reducing (though not risk-eliminating) mechanism in the sense that by putting in place all the tools and sub-agreements necessary for rapid disease response, it can eliminate uncertainty, speed up implementation of disease response plans, and thereby limit negative consequences for Australia and its livestock industry. It is also seen as a mechanism for equitably distributing stakeholders' financial risk according to the "beneficiary pays" principle.

Table 4.5. Key features of Australia's compensation scheme

Name of scheme	Emergency Animal Disease Response Agreement (EADRA)		
Legal basis	Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (ratified March 2002)		
Institutional framework			
Scheme governance	Animal Health Australia (AHA) acts as custodian of the EADRA through ensuring a near-continuous performance review process. Following an outbreak, AHA moves to an administrative role, collecting data on the disease response and processing claims made by cost-sharing partners. The National Management Group invokes the EADRA through approval of a post-incident Emergency Animal Disease Response Plan. The technically oriented Consultative Committee on Emergency Animal Diseases informs the National Management group by reviewing the disease response plan put forward by the affected state(s)/territory(s) and forwarding its recommendation on the plan's appropriateness.		
Main stakeholders	Animal Health Australia Commonwealth Government of Australia All Australian state and territory governments 14 organisations representing the livestock industry	→ (Represented on)	National Management Group Consultative Committee on Emergency Animal Diseases
Is private insurance coverage available?	Private insurance for risks resulting from livestock diseases is not widely held by Australian livestock owners, in part because there are few "off-the-shelf" products available.		

Table 4.5. Key features of Australia's compensation scheme (*continued*)

Compensation		
Overview of the scope of compensation	Cost-sharing under the EADRA applies to several types of expenses: 1. Salaries and wages; 2. Operating expenses; 3. Capital costs; and 4. (Livestock holder) compensation For salaries and wages, operating expenses, and capital costs, the cost-sharing-eligible expenses are those which result directly from disease response plan implementation and exceed the implementing agencies' normal commitments. Thus, neither routine biosecurity expenses nor consequential losses incurred by communities within affected states/territories are cost-shared. Compensation is payable for livestock or property destroyed to control an emergency animal disease, as well as for dead animals that, had they not died of the disease, would have been ordered slaughtered.	
Are consequential losses covered?	No allowance is to be made for loss of profit, loss occasioned by breach of contract, loss of production or any other consequential loss whatsoever.	
Stakeholders' eligibility for compensation	Commercial livestock holders Small industries/smallholders AHA (cost-sharing of expenses) Commonwealth and state/territory governments (cost-sharing of expenses)	Are compensated for animals and property destroyed during a disease response and for dead animals which would have been culled Are eligible for compensation, even if not represented by an EADRA signatory, if their industry gross value of production (GVP) is less than AUD 20 million Can be reimbursed for non-normal costs incurred during a disease response Are eligible for cost-sharing of non-normal costs of salaries and wages; operating expenses; capital costs; and compensation payments
Rules for valuation	For destroyed property, the value is assessed immediately prior to destruction. For livestock compensation, the market value of the destroyed and dead-as-a-result-of-the-disease animal(s) is indemnified on the basis of the farm-gate price. When applicable, a second, top-up payment compensates for the difference between the market value of the equivalent livestock on the date restocking eligibility is granted and the previous compensation.	
Conditionality	Unless in a sector with GVP less than AUD 20 million, a livestock owner must be represented by one of the industry organisations that are EADRA signatories to be compensation eligible. Industry parties must advise their members to notify authorities within 24 hours of an incident. Also, a state/territory may lose its claim to cost-sharing through failure to notify the Consultative Committee on Emergency Animal Diseases of an incident within 24 hours. Livestock holders must notify the appropriate authority of dead animals within 24 hours. Industry parties have also committed to development of biosecurity plans.	
Timeframe for compensation	A holder's initial compensation claim must not follow livestock death/destruction by more than 90 days; a request for a valuation of restocking cost needs to be made within 30 days of notification of restocking eligibility; and a claim for a second compensation payment has to be made within 21 days of receipt of the second valuation's results. Compensation payments are made in short order by the states/territories.	

Table 4.5. Key features of Australia's compensation scheme (*continued*)

Diseases covered	The EADRA cost-sharing mechanism covers 65 emergency animal diseases, providing significant certainty for disease response planning and funding. The list of diseases is divided into four categories.
Differentiated treatment of diseases	The division of diseases is based on several factors, including potential to cause socio-economic losses, human/environmental health consequences, and adverse economic effects for the livestock industry. <i>Category 1:</i> funded 100% by government → very high public benefits <i>Category 2:</i> funded 80% by government and 20% by the industry → high public benefits <i>Category 3:</i> funded 50% by government and 50% by the industry → moderate public benefits <i>Category 4:</i> funded 20% by government and 80% by the industry → low public benefits
Financial structure	
Funding sources and mechanisms	Each participating Lead (state/territory) Agency initially pays its own costs, then the cost-sharing formulae in the EADRA are utilised to calculate reimbursement transfers. Livestock industries use zero-based, i.e. only activated when necessary, statutory levies to raise funds. When necessary, the Commonwealth Government will initially pay the industry share of the costs following an outbreak, and the affected industry(s) then have ten years to reimburse the government.
Cost-sharing	Distribution of cost-sharing contributions among the states/territories is based, for Category 1 diseases, on their respective human populations. For other disease categories, the shares are based on their relative populations of the concerned livestock species, their shares of the GVP of the affected industry, or a combination of the two. These methods distribute the government cost-sharing burden such that those states/territories benefitting most from control of a disease pay more. When an emergency animal disease affects more than one species, the cost-sharing contributions of the affected industries are based on the GVP of each industry and a weighting which reflects the disease's impact on each industry. When multiple industry parties represent a single affected species the cost-sharing is determined by the parties, but should take into account the GVP of the individual sectors. There is a GVP-based cap on total shared response costs of 1% of the GVP of the industry(s) affected (2% for foot-and-mouth disease). The EADRA parties' cost-sharing contributions are primarily <i>ex post</i> in nature. Nonetheless, there are several "peace-time" undertakings funded through a distinct <i>ex ante</i> cost-sharing – these costs are equally divided among the Commonwealth Government, the state/territory governments, and the industry's full AHA members (even if those members are not signatories to the EADRA).
Practical experience	
Incentives provided (for prevention/biosecurity practices and early notification)	Development of robust biosecurity is required through risk-mitigation regulations in the EADRA. The EADRA does not provide proportionally lower compensation for dead or visibly sick animals, but it does essentially require 24-hour notification of diseases for compensation eligibility. Strong incentives for co-operation with eradication efforts are provided to livestock holders via the top-up compensation payments which ensure holders' ability to equivalently restock culled or dead animals. All relevant EADRA parties take part in decision-making when affected by a disease outbreak. This involves them in the response and likely also creates a sense of responsibility for EADRA-related efforts.
Efforts to mitigate potentially adverse incentives	Moral hazard issues related to compensation are addressed in several ways: • The requirement to develop biosecurity plans; • Industry contributions to cost-sharing in cases of Category 2, 3, or 4 outbreaks; • Conditionality attached to compensation: no illegal behaviour or failure to adhere to standards; • No coverage for consequential losses means livestock holders have an incentive to report and cooperate in order to limit the duration and extent of an outbreak. Animal Health Australia reports no negative experiences associated with adverse compensation-linked incentives. Livestock industry adherence to the agreement has reportedly been solid.

Notes

1. Section 4.1 of this chapter is mainly based on the report “Management of risks from epidemic livestock diseases: Review and comparison of Prevention and Control systems in selected countries”, prepared for the OECD by a team from Phylum Consulting (France). Sections 4.2 and 4.3 are mainly based on the report “Management of risks from epidemic livestock diseases: Overview of key issues and comparison of compensation and cost-sharing systems in selected countries”, prepared for the OECD by a team from Civic Consulting (Germany).
2. Anthrax-associated ring vaccination campaigns carried out from 2005 through 2009 affected between 3 000 and 11 000 animals each year.
3. It is noteworthy, though, that coinciding with the 2002 ratification of the EADRA, AHA held discussions with the agricultural insurance industry centred principally on whether implementation of the EADRA framework might boost the feasibility of livestock disease insurance products. Two options were mainly covered during these discussions: 1) the possibility for private insurance to underwrite direct costs in excess of the industry cost-sharing contribution limit (i.e. 1% – and 2% for foot-and-mouth-disease – of the outbreak-affected livestock industry’s gross value of production (GVP)); and 2) private insurance coverage for livestock holders’ disease-derived consequential losses (Neumann and Keogh, 2006, p. 156). Neumann and Keogh reported in 2006, however, that “Little substantive progress [had] been made in developing such products...”
4. The company now has 31 members across five categories: the Commonwealth Government, state and territory governments (8), organisations representing the livestock industry (16; there are two livestock industry organisations that are full AHA members but not parties to the EADRA), service providers (3; e.g. the Australian Veterinary Association), and associate members (3) with rights – save for voting at general meetings – similar to full members.
5. Animal Health Australia was initially named the Australian Animal Health Council; it was established via the Australian Animal Health Council (Live-stock Industries) Funding Act of 1996.
6. As reported by AHA, the EADRA updating process is as follows: each year suggestions for refinements of the EADRA are collected and then discussed among signatories at the annual workshop. Subsequently, any pending modifications are formally sent out to all the EADRA parties, representatives of which would need to sign each of the proposed variations and return a hard copy of the authorised text.
7. The EADRA defines “Affected Parties” as “Those of the Commonwealth, State and Territory Governments and any Industry Parties who are affected by an Incident or an outbreak of an EAD” (AHA, 2010, pp. 7, 10 of the EADRA Deed).
8. Following the initial notification from industry to government (which could also be made by veterinarians or laboratories in the affected jurisdiction), the notified government party has an additional 24-hour window to provide formal notification of the incident to the Consultative Committee on Emergency Animal Diseases (AHA, 2010, pp. 24, 25 of the EADRA Deed). The National Management Group has the final say on whether a party has appropriately reported an emergency animal disease incident (AHA, 2011, p. 13).
9. Although AHA is not a government or industry party, “the principles of Cost Sharing will apply to costs incurred by it in respect of an EADRP [Emergency Animal Disease Response Plan] which are additional to its ordinary operating costs” (AHA, 2010, p. 21 of the EADRA Deed).
10. Cost-sharing eligible salaries, wages and allowances include, among others, salaries of staff members or consultants who directly assist with disease eradication; salaries of staff

members or consultants hired to backfill positions of seconded staff members; costs of meals and accommodation provided to response-involved staff members and consultants; and payments to private veterinarians solicited by the government party(s).

Operating expenses eligible for cost-sharing include, among others, expenses directly incurred by a party involved in a disease response plan; non-routine staff expenses and operating costs of internally provided (by a state/territory government agency) laboratory services; and the costs of external laboratory services provided to a state/territory (the marginal costs if a services contract already exists or a price comparable to that charged by a government laboratory).

Finally, sharing-eligible capital outlays include purchases of essential equipment required by the parties responding to an outbreak. However, “major” capital expenditures like motor vehicles and buildings are not eligible because of their lengthy lifespans and the resulting potential to utilise them for future work (AHA, 2010, pp. 27-29 of the EADRA Deed).

11. Additionally, the non-coverage of consequential losses is expressed as a policy in *EADRA Business Rules: Guidelines for Accounting and Cost Sharing under the EAD Response Agreement* (AHA, 2010).
12. Theoretically, if the initial compensation payment to a livestock owner (based on the market value of animals dead or culled as a result of the disease in question) was higher than the market price at the restocking eligibility date then the livestock owner would be “better off”. However, associated consequential losses related to the outbreak and its interruption of business would likely cancel out this potential result.
13. Compensation payments can also be nullified or limited as a result of any relevant illegal behaviour or false statements (AHA, 2010, p. 30 of the EADRA Schedules).
14. Most of the 65 diseases listed in the EADRA are also OIE Listed Diseases; however, there appear to be at least a dozen diseases listed in the EADRA that do not appear on the OIE list. Notably, all of the former OIE “List A” diseases are incorporated in the EADRA.
15. Levies are developed by the livestock industry organisations participating in the EADRA and approved by the government. Thus, the units (e.g. animal or animal product) on which they are assessed vary by industry sector.
16. The generally insubstantial nature of modifications made to-date can be seen in the results of the first five-year review of the agreement, which was conducted in 2007. Recommendations included: 1) fine-tuning of the definition of an emergency animal disease; 2) clarification/simplification of the disease categorisation process; 3) specification that the EADRA should not apply to indeterminate, long-term disease containment – if despite initial response efforts a disease is deemed ineradicable then procedures exist to terminate use of the EADRA; 4) improved definition of parties’ “normal” commitments (cost-sharing applies only for expenses exceeding this financial baseline); and 5) increased participation of industry sectors, i.e. the need for non-signatories within the livestock industry to formalise their commitment to the EADRA and guarantee their ability to pay their share of relevant disease responses.
17. Due to the almost entirely *ex post* nature of the utilised levy systems, such a mechanism would be difficult to implement in Australia.
18. The timing of the payment of premiums/levies by farmers has been identified as impacting their risk awareness and incentives to take preventive action, and it has been suggested that a mix of *ex ante* and additional payments (or levies) to one scheme is likely to produce the strongest preventive effect (Melyukhina, 2011, p. 57).

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Chapter 5.

Botswana

This chapter describes important features of the animal disease management system in Botswana. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The concluding remarks summarise the main characteristics and challenges.

Botswana, officially the Republic of Botswana, is a landlocked country in the Southern African region. It is a country of 581 730 km², with just over 2 000 000 people, mostly concentrated in the south-eastern region. The country is mainly flat, tending toward gently rolling tableland. The northern part has a tropical climate, with higher rainfall (500-700mm/year) than other regions. The eastern region has a semi-arid, sub-tropical climate (rainfall: 400-500mm/year). The western region is the driest part of the country (in the Kalahari Desert, in the extreme southwest, the rainfall is less than 250 mm/year).

The President of Botswana is both head of state and head of government (which exercises executive power), and of a multi-party democratic system. Legislative power is vested in both the government and the parliament. Botswana is divided into ten administrative districts, which are then further divided into a total of 28 sub-districts based on population and economic activities.

Botswana has a rapidly developing market economy closely tied with the economy of South Africa. Since independence, Botswana has had one of the fastest growth rates in per capita income in the world, and has transformed itself from one of the poorest countries in the world to a middle-income country. Gross National Income per capita is USD 13 910 PPP (according to the World Bank, 2010 estimate). Botswana is a member of SADC (Southern African Development Community) and of SACU (Southern African Customs Union).

The livestock industry is the dominant component of Botswana's agriculture but generates only 2.6% of total measured GDP. Botswana has a longstanding export market for beef to South Africa and to the European Union; all other livestock sectors are marginal or in the early stages of development. Botswana's dairy sector is developing but produces less than 50% of the quantity of fresh milk consumed in the country. The relatively new poultry sector has developed, and made the country almost self-sufficient. Pork is mostly imported from South Africa.

Botswana has a population of around 2.4 million cattle, which are distributed throughout the country (except for national parks and game reserves) under two production systems: traditional/communal (accounting for about 80% of the national population), and commercial (20%). The "cattle post" production system uses unfenced, communally held rangeland with central watering points. Tribal or communal land makes up about 70% of the country, and is administered by local Land Boards. Commercial systems are practised mainly on leasehold and freehold land. Most commercial farmers are relatively wealthy as they have access to finance and the commercial marketing sector. Within the commercial sector, production systems include intensive livestock production systems, such as feedlots.

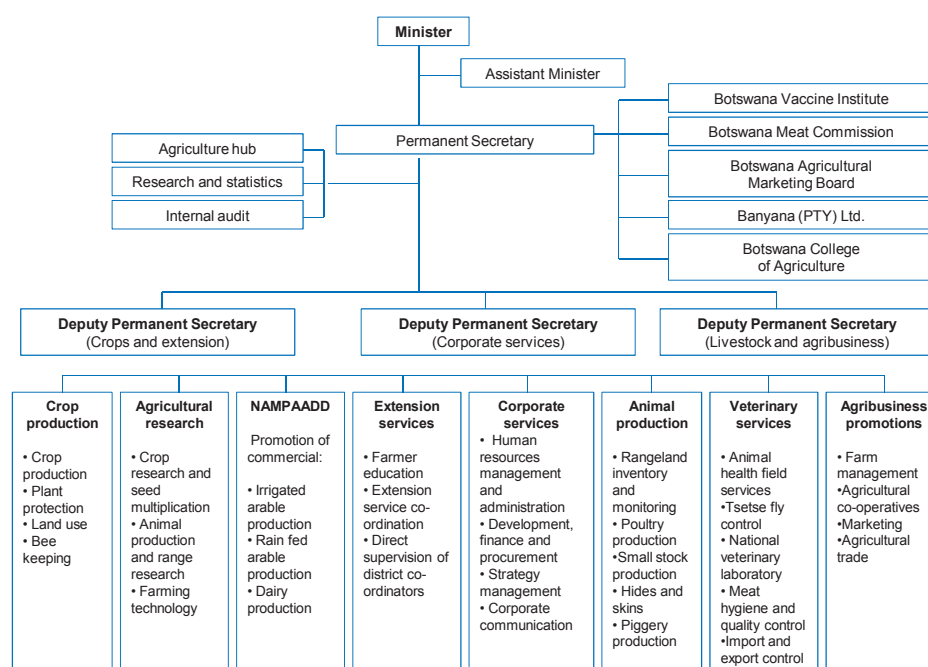
The beef industry is export-oriented. The Botswana Meat Commission (BMC) abattoirs approved by the European Union for export have the monopoly of exports of fresh beef from Botswana. BMC also has markets in Norway, Hong Kong, Kenya, Malawi, Zimbabwe, Mauritius and South Africa. In 2002, an estimated 90% of beef produced was exported. However, the cattle industry in Botswana suffers from major setbacks, due to Foot and Mouth Disease (FMD) outbreaks in the country, leading to isolation from the lucrative EU markets. The exported quantity of beef meat fell between 2006 and 2008 (FAOStat, 2011).

Botswana has to deal with some major animal diseases: FMD is present in a part of the country (which is divided into two main zones: FMD-free zones with no vaccination and FMD-free zones with vaccination). This disease is a major concern, because of its important impact on international trade. Several other diseases are also an issue for the cattle industry: heartwater, lumpy skin disease, anthrax, brucellosis. Botswana is free of classical swine fever and of *peste des petits ruminants* (PPR).

5.1 Prevention and control system

The Department of Veterinary Services (DVS) within the Ministry of Agriculture (MoA), is the competent authority (Figure 5.1). The head of the DVS is the Chief Veterinary Officer (CVO) and is the Botswana's OIE Delegate. The DVS has six technical divisions (headed by Deputy Directors who are all veterinarians), and one division in charge of administrative matters.

Figure 5.1. organisation chart of the Botswana MoA and Veterinary Services



Source: Fermet-Quinet *et al.*, 2010.

The Veterinary Services (VS) follow the administrative divisions, with ten District Veterinary Offices (DVOs) and 28 sub-district veterinary offices (ten housed with the DVOs). All ten DVOs are headed by veterinarians, but the Sub-District Veterinary Offices (SDVOs) may be headed by a non-veterinary scientific officer. The next administrative level is the cluster, which is further divided into extension areas (294 in the country) at the VS operational field level (Fermet-Quinet *et al.*, 2010).

Risk assessment

Risk analysis is handled by the animal disease control and prevention division (field extension services) using input from all appropriate divisions, and is integrated in the definition of the FMD contingency plan. The risk analysis process is known, but no specific personnel are dedicated to it. For other diseases, there are few specific risk assessment studies, and these are mainly based on OIE recommendations.

The VS capture a huge amount of data at each level: e.g. data forms, operations registers, animal census data, disease incident reports, animal movement documentation, border and zones movement, food inspection, and resources management (car logbooks, drug stocks, spares, etc.). This documentation is usually summarised in monthly reports, aggregated at each level of the VS and unified into a national yearly report.

There are various electronic databases with data on animal health in Botswana.

- *Livestock Identification and Traceability System (LITS)*: since 2000, the VS have implemented an individual animal identification system using electronic boluses. Cattle can be identified by the unique bolus number.
- *Botswana National Veterinary Laboratory (BNVL)*, which has a database to record sampling and results. Some links are established with the epidemiology section of the veterinary services.
- *Geographical Information System (GIS)*.

The PVS evaluation of Botswana Veterinary Services carried out by the OIE in 2010 concluded that these databases were not integrated, and that the individual electronic databases should be made compatible so that the data can be shared and integrated. Linking the three existing databases would greatly enhance the utility of the data. Since this evaluation, some efforts have been made to connect these databases.

Decision-making

The animal health management system in Botswana is mainly based on a centralised public system with a clear chain of command from the headquarters to the field level, providing good transfer of information and access to diagnostic and animal health programmes in the field, following the administrative organisation of the country. The minister has powers to introduce regulations to improve implementation of the Diseases of Animals Act, which the Director of Veterinary Services is responsible for implementing. The Director's role is independent of the policy-makers, which is crucial to disease control. Examples of this independence are to be seen in some technical decisions taken on specific cases involving major meat companies or politicians (see PVS report, Fermet-Quinet *et al.*, 2010). At the district level, the district veterinary officer is independent, and refers directly to VS headquarters.

There is no formal institutional structure for stakeholder consultation, which is mainly *ad hoc*; however, well developed consumer groups are organised within a national association. Producers are often consulted to organise animal health campaigns and sometimes to review gaps found during these campaigns. The Foot and Mouth Disease Contingency Plan (FMD CP) was developed through a series of consultations with all stakeholders in both government and private sectors including private veterinarians, and local FMD vaccine manufacturers and suppliers. This Plan is available as a reference document for all stakeholders involved in the control of the disease.

Botswana is an active member of the SADC Livestock Technical Committee, which the CVOs of the member countries attend the twice-a-year meetings to discuss all livestock, animal health and public health issues. Within SADC, there are well established trade protocols, and these sanitary agreements facilitate regional trade. There are also many bilateral communications between neighbouring trade-partner countries. These communications enable the definition of sanitary policies and trade rules for animals and animal products. For most countries in the region, farming represents an important economic issue, and is therefore considered to be a priority subject in discussions between governments. There is no direct discussion with foreign stakeholders, who discuss with their country's government; the different CVOs then discuss with each other.

Decisions on animal health policy are mainly based on OIE recommendations, with no specific tool such as cost-benefit or impact analysis. Some cost-benefit analyses on FMD (Mapitsé, 2008; ODI, 2007) have taken into account the FMD situation in South African countries, the legal and non-legal trade implications, and the impact on exports.

Implementation of animal health programmes

There are disease programmes for the diseases of most important concern in Botswana: for cattle, these are FMD, contagious bovine pleuropneumonia (CBPP), lumpy skin diseases, anthrax, pasteurellosis, and black quarter (blackleg). The programmes are mainly focused on cattle, as the sector with the most important economic weight. The most important programme is to maintain the status of the FMD-free zones in several areas. Taking into account that the virus is hosted by several wild animals (zebus, buffaloes...), FMD is controlled in one part of the country with vaccination, with other parts declared to be free of the disease without vaccination. However, regular outbreaks in disease-free zones cause stoppages of meat exports to the European Union, with time needed to recover the sanitary status.

For poultry sectors, there are some programmes for Highly Pathogenic Avian Influenza (HPAI) (surveillance) and Newcastle disease (surveillance and vaccination): the farmers buy vaccines, and the vaccination is done by VS technicians free of charge. The main objective is to support backyard production, which is important for poor communities. For small ruminants, there are programmes to detect some diseases and to promote vaccinations.

The field level of the VS organisation in Botswana is based on 294 extension areas, each with at least one technical officer (veterinary para-professional) and one support (industrial-class) staff member. The extension areas serve farmers day-to-day needs directly at “crush-pens” (cattle handling facilities used cooperatively by neighbouring farmers). Veterinary medicines and biologicals are mainly retailed through public veterinary services via 35 Livestock Advisory Centres (LACs), generally located within the Sub-District Veterinary Offices (SDVOs) or extension area offices. The extension area technicians provide services free of charge mainly for small farmers (vaccination, animal care). They act quite independently under their own initiative and responsibility, and meet monthly to report to the DVO. SDVOs supervise a total of 56 internal checkpoints as part of the animal disease control zoning system. Administratively, international border points report directly to the DVS. However, in practice most are supervised by the local SDVO.

There are around 60 veterinarians in the public services (animal health, public health, laboratories), and about 750 paraprofessionals in the public sector for animal health. In the private sector, there are around 40 veterinarians, working either in a veterinary clinic mainly with companion animals, or in private companies. Private practitioners work also in commercial farms, feedlots and industrial poultry farms, for animal treatments and the supply of veterinary drugs. However, most of the veterinarians in official veterinary services are involved in co-ordinating activities in the VS headquarters or in the DVSO, and cannot spend a lot of time in the field. This public network is probably efficient in supplying basic services, but lack of training and supervision encourages big farms to use private veterinarians, and hence reduces the efficiency of the public network.

Botswana has 28 border entry posts, including four international airports. Border inspection posts (BIPs) are established at every entry post within the global custom facilities. Land borders are fenced to limit incursion of foreign livestock and wildlife, and the number of BIPs where live animals may enter into the country is limited. These posts are always under the supervision of a veterinarian, even if the post is under the customs authority. Importation of live animals is strictly controlled, especially into the FMD free without vaccination zones. Facilities at the border crossings that allow imports of livestock are equipped with off-load facilities in order to examine and individually identify imported animals (bolus). However, traditional movement of animals across the border make it difficult to ensure that all imported live animals are correctly registered and checked at the border posts. For other border posts where there are imports of animal products, there are only para-veterinarians and gate keepers, working in close collaboration with customs and police. They are linked by telecommunications and supervised by DVO veterinarians. Cross-border security committee

meetings (involving different public departments) are held every year to co-ordinate border control. Border security meetings are also held at district levels, and joint border patrols with customs and police have been implemented.

Within the country, the VS have for several decades successfully implemented strict control of animal movements between disease control zones to maintain beef exports to South Africa and Europe. A branding act exists. Transport permits are issued by the DVS, and verified at internal check points, and the LITS allows identification of the cattle at export. The system is managed by the Livestock Identification and Trace-back Division. However, since 2003, the EU audit reports have warned VS of serious deficiencies with their traceability capacity. In 2010, the VS requested FAO to make an assessment of the LITS and proposed improvements.

Botswana is famous for its zoning system based on hundreds of kilometres of animal and wildlife control fences. Approximately 20 FMD control zones have been progressively refined over the last 50 years to maintain export markets. FMD outbreaks are contained in disease free with vaccination zones. As part of the country's zoning programme, the VS established 18 cattle quarantine camps (currently five are in use) to control animal movement into the higher health status zones. These camps are large tracts of land, usually double-fenced and divided into several padlocks with a central borehole and crush pen. Animals are kept for 28 days and vaccinated against FMD at days 1, 14 and 28. Although these quarantine camps are not used to achieve a higher health status, they clearly indicate that the VS are able to establish and maintain a form of compartmentalisation. However, failure to address deficiencies identified in zoning and animal identification may imperil beef exports in the future. Biosecurity at farm level is more developed for dairy farms and feedlots. Guides on biosecurity measures exist for ostrich farms and dairy farms. For meat exports, there are particular biosecurity rules, such as truck disinfection.

Some vaccinations are paid by the government (vaccine and service are free of charge to the farmer), e.g. FMD, blackleg, anthrax, brucellosis. For other diseases such as pasteurellosis, lumpy skin disease, heartwater and Newcastle disease, the vaccines are paid for by the farmers, but the service (vaccination of the animals by a technician from an extension area) is publicly funded.

Compensation for animals ordered to be destroyed may go up to a third of the animal's value, but is variable and depends on the national budget. In the past, the government has provided funds, mobilised on a case-to-case basis, in a timely manner for FMD and CBPP outbreaks. The limited capacity for compensation can reduce the capacity to control the disease in case of a large outbreak, since uncertainty as to the availability of compensation may be a factor reducing the declaration of suspicious cases by farmers.

Outbreak management

Botswana has good experience in responding to animal disease outbreaks (see Box 5.1 for an example). A contingency plan for FMD is well established at the national level. A disease alert team (e.g. epidemiologist, veterinary laboratory) has the capacity to be on site within 24 hours in case of identification of an FMD outbreak.

As an exporting country to the European Union, the VS of Botswana are regularly audited by the EU Food and Veterinary Office (FVO) to verify their capacity to ensure that exported products comply with EU requirements. There is no real process of internal supervision. As in other countries, the PVS analysis was an opportunity to assess the animal health system. Some of the recommendations made in Botswana have been taken into account, and weaknesses addressed.

Box 5.1 A new FMD outbreak in the eastern part of Botswana in May 2011

On 5 May 2011, Botswana reported an FMD outbreak in the eastern part of the country in a FMD free without vaccination zone. Immediately after confirmation, a containment zone was created by official veterinary services in the affected area to ban any cattle movement, and all cattle were vaccinated.

The DVS ordered a ban on moving all cloven-hoofed animals and their derived products within and between veterinary zones, except FMD vaccination zones. All export abattoirs were closed immediately. The movement ban was adapted with the evolution of the outbreak (11/07/2011, 24/8/2011, and 7/10/2011).

Meetings were organised between the Ministry of Agriculture, veterinary officers and other stakeholders in May to discuss how to deal best with this outbreak. At the beginning of June, the government mobilised a significant budget for the control measures, but the compensation rules were not precisely defined. The DVS encouraged farmers to declare any animals with suspicious symptoms.

5.2. Concluding remarks

The Botswana animal health system is an example of a model mainly based on public veterinary services. The management of animal health within the country is still public, and a private veterinary profession that would work with the public services is not yet much developed.

The transition between a governmental system and partnership between private veterinarians and official veterinarians takes time. The first issue is to determine how to allow a sustainable activity for private veterinarians. For that, the official services have to stop providing services free of charge, when these does not concern official control programmes for priority diseases. A network of private veterinarians can be maintained if their income is based on services provided to farmers, on sales of veterinary medicines and biologicals, and publicly funded delegated activities such as vaccination campaigns.

In the context of Botswana with FMD present in neighbouring countries and its FMD-free zone for exported meat, the priority is FMD control. Regular outbreaks challenge the maintenance of the sanitary status, in order to ensure the exports to the European Union and other high-value markets. Strategy to control the disease is based on slaughtering contaminated animals and vaccination around the zone to contain the virus in the concerned zone until its total elimination.

The consultation process between the different actors is not very well developed, but this is acceptable, taking into account the size of the country, and the strong consensus on the FMD policy.

This model is efficient, since it enables to control a disease which is complicated to deal with, with a FMD-free zone with vaccination in the North and a FMD-free zone without vaccination in the South. These allow the country to export most of its beef production when there are no FMD outbreaks.

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Chapter 6.

Brazil

This chapter describes important features of the animal disease management system in Brazil. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The concluding remarks summarise the main characteristics and challenges.

Brazil, officially the Federative Republic of Brazil, is the largest country in South America, and the fifth largest country in the world, both by geographical area of 8 514 877 km² and by population with 203 429 773 people (FAO estimate, July 2011). Brazil's topography is quite diverse, from the Amazon basin in the north and west to the Brazilian Highlands in the southeast. Almost all of Brazil has a humid tropical or subtropical climate, but eastern Brazil suffers from regular droughts. The Brazilian Highlands and plateaux generally average less than 1 200 metres. Extensive uplands lie in the southeast and drop off quickly at the Atlantic Coast.

Brazil is a federative democratic republic with 26 states and one Federal District where the capital Brasilia is located. Administration is based on three distinct levels: the federal level, the federative units (States and federal district), and the municipalities. The President is both head of state and head of government of the Union. Executive and legislative branches exist in each federal unit to operate and design the specific laws for its territory. For animal health, the federal level defines common legislation, and each State is in charge of applying animal health policy on its territory.

During recent decades, animal production in Brazil has grown strongly. Brazil is one of the most important producing and exporting livestock countries in the world:

- 2nd producer of beef meat and 1st exporter;
- 4th producer and exporter of pig meat;
- 4th producer of poultry meat after the United States, China and the European Union, and 1st exporter in 2010;
- 5th producer of milk after the European Union, the United States, India, and Russia.

Brazil has a population of more than 200 million head of cattle, and 36 million pigs. Animal production is mainly developed in the States of the South, with commercial farms or integrated farms (pig and poultry sector) and a high level of productivity. More extensive farms with *fazendas* (plantations) on big areas are more developed in the Central-West part of the country and in the South-East region. Although the large part of Brazil's animal production is produced by commercial farms and large *fazendas*, some animal smallholders are also present in the country.

Brazil is a large country with different sanitary situations depending on its federal units and their climates, landscape, etc. Beyond the annual report sent to the OIE with a long list of diseases present in the country, there are various epidemiologic situations. We can however identify two groups of important diseases:

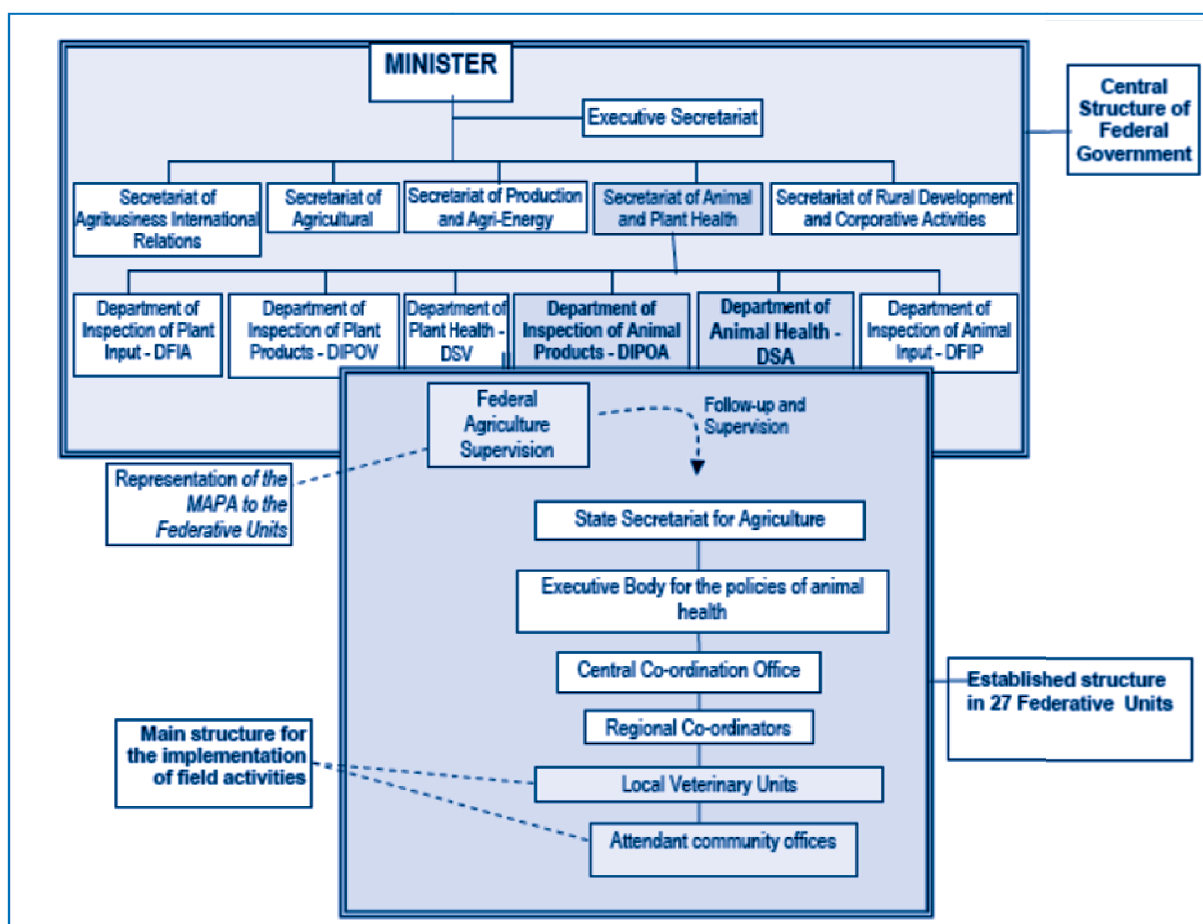
- Diseases regularly notified in the country and for which there are federal programmes. These concern, for example, zoonoses: bovine tuberculosis, brucellosis, and rabies.
- Diseases not reported recently but with some cases during the last six years: for example, FMD (last outbreak in 2006) had an important international trade impact, with economic losses.

FMD eradication is still a priority in Brazil, which exports almost everywhere in the world. Maintaining the status of FMD-free zones without vaccination is a big issue for the States with such zones. For other zones, the efficiency of the vaccination campaigns is a priority, in order to limit the circulation of the virus.

As illustrated in Figure 6.1, the Ministry of Agriculture, Livestock, and Food Supply (MAPA) is the competent authority, through the Secretariat for Plant and Animal Health and Inspection (SDA). The SDA covers Plant Protection and Animal Health. In the SDA, animal

health policy is mainly co-ordinated by the Department of Animal Health (DSA). The Department of Inspection of Animal Products is responsible for inspections in slaughterhouses and of animal waste. The co-ordination of animal identification (SISBOV) is also done by SDA. As well as these departments, there are two co-ordination services: the General Coordination of Laboratory Support (CGAL) which coordinates the activities of laboratories involved in animal health and plant health, and the General Coordination of the Agriculture Surveillance System (VIGIAGRO) which coordinates border post monitoring services. The SDC (Secretariat of Rural Development and Corporate activities) is in charge of the development of agriculture and livestock.

Figure 6.1. Organisational structure of the veterinary services in Brazil



Source: OIE-PVS report, Schneider *et al.* (2007).

In each federative unit (State or district), the MAPA has a representation called the Federal Superintendence of Agriculture (SFA), whose mission is to supervise and follow up the activities developed by each federative unit. Each State has its own veterinary service, responsible for co-ordination and implementation of the animal health policy on its territory. Their first mission is to apply the federal policy. However, they can develop specific programmes for their territory. Each state is divided into municipalities which are used as the basic units for surveillance and epidemiologic information. The field network is based on UVs (*Unidade Veterinária Local*) in which there is one state official veterinarian, who is in charge of several municipalities, depending on the importance of livestock. There is also a network of private veterinarians providing animal health services for farmers.

6.1 Prevention and control system

Risk assessment

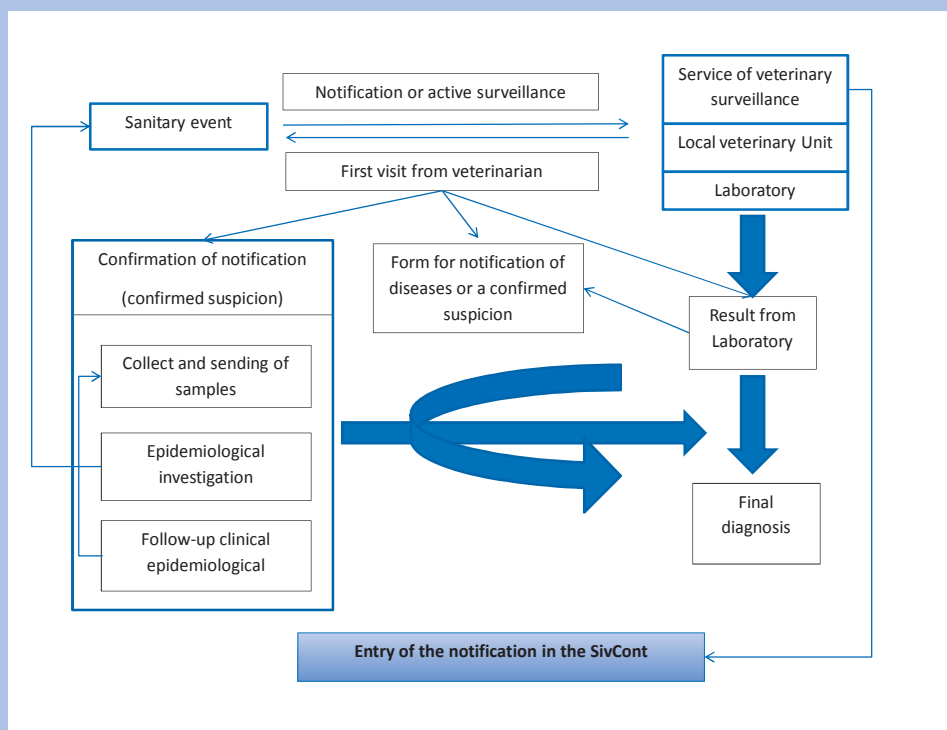
There is no specific institution in charge of risk assessment for animal health in Brazil. In some cases, a specific team is designated with staff from different SDA departments to carry out such risk assessments. Some experts from Universities can also be involved. Risk assessment is mainly used internally to assess the risk of introduction into the country of new pathogens, as has been done recently to study the risk linked to imports of Zebu embryos from India. Based on this assessment, some recommendations to importers can be published. Risk assessment for animal health within the country is less developed. However, the SDA has established some rules to assess and manage the situation in case of new outbreaks. These rules have been defined to support the Veterinary Services (VS) of the state to take relevant measures in case of a new outbreak. The risk assessment is based on OIE standards.

Box 6.1. SIVCONT: A continental data base

SIVCONT is a database managed by the PANAFTOSA organisation to share sanitary information between the countries of the South American continent. As is illustrated below, when a sanitary event occurs, there is a process to confirm the suspicion and then to record it in the SIVCONT database by the VS in charge of the surveillance of the territory. This information is available for the neighbouring countries and allows better access to information.

With this database, each country can carry out and update its risk analysis, taking into account the evolution of the epidemiologic situation in its country and its neighbouring countries.

SIVCONT notification process



Source: PANAFTOSA website (www.fundeppecpr.org.br/?pag=relatorios).

For risk analysis, the federal VS use three sources of information

- Information sent by each federal unit. In case of epidemiological events, the UVLs transfer the information to the regional and to the State VS. Each state uses its own information database (or Excel sheet) to record the sanitary information. All states use SIVCONT (Box 6.1). The State VSs regularly transfer the data to the federal VS. The SDA has a project (currently in the development phase) to build a national database to improve the sharing of information.
- SIVCONT is a continental database available on internet with a protected login. It has been created by PANAFTOSA to follow the notification of suspicion of FMD or other important diseases in the continent (see “regional co-ordination” below).
- VIGIAGRO collects data from international border posts (e.g. ports, airports, roads). Inspection at international border posts is the responsibility of the federal VS (states have border posts between them).

Decision-making

The federal VS define the common rules for the country and design the national programmes for prevention, control and eradication of the most important diseases: brucellosis and tuberculosis, rabies, FMD, Transmissible Spongiform Encephalopathy, avian influenza, classical swine fever, equine infectious anaemia, ... The federal VS also design animal health programmes for species (e.g. poultry, small ruminants, beekeeping, pigs).

These rules are gathered in a manual of regulations (*Manual de Legislação*) (Ministerio da Agricultura Pecuária, 2009). Each State or district is responsible for defining implementation texts to apply the national policy. For instance, the rules are defined at the national level, and the penalties, in case of non-compliance with regulations, are defined at the State level. Taking into account the local context, each State can define complementary measures or develop specific programmes for other diseases. For instance, the State of Rio Grande do Sul has developed a control programme on screw disease with Argentina and Uruguay. The federal level organises co-ordination with State levels through regular meetings.

At federal level, the Ministry of Agriculture has created a forum for the main agricultural sectors (www.agricultura.gov.br/camaras-setoriais-e-tematicas), including some specific permanent forums for livestock sectors (cattle meat, dairy sector and dairy products, small ruminants, honey and beekeeping, ...) with representatives of the main sectoral associations (producers, processing industry, Discussions cover all topics concerning the policy of the sector. As can be seen on the minutes of the meetings, specific points on animal health policy are regularly reviewed (new animal health programmes, new legislation, sanitary situations, and sanitary requirements of importer countries). Such consultations are also organised at State level. However, this depends on the capacities of the professional organisations in each State and in each sector.

There are three levels of regional animal health co-ordination.

- PANAFTOSA (*Centro Pan Americano de Febre Aftosa*) is the scientific centre of the Pan-American Health organisation/WHO created in 1951. The mission of this organisation is to develop co-operation between the American countries for the control and the eradication of the main zoonoses and of FMD. The centre collaborates with the OIE. Initially created for FMD, its missions have been extended to the main animal diseases and to the food safety of animal products. Thus, it is the first level of co-ordination of animal health policy through technical co-operation, sharing of information and research results. With the extension of its mission, it is really a tool to integrate

animal health policy for the South American countries, with a sharing of the main sanitary information.

- The Mercosur (Argentina, Brazil, Paraguay, Uruguay and Venezuela) has created a permanent veterinary committee with regular meetings to co-ordinate animal health policies between these countries, and to discuss sanitary problems which create barriers to trade development. This committee is composed of the Chief Veterinary Officers (CVOs) of each member country.
- Bilateral discussions between CVOs co-ordinate some specific programmes between both countries (e.g. FMD programmes between Brazil and Bolivia).

Regional co-ordination is done through the CVO (or their representatives). There is no direct consultation with foreign stakeholders. Each country organises its consultation with its own stakeholders' associations. However, in some sectors, the national associations have created a federation to discuss with Mercosur.

The decision to develop a new federal animal health programme is not the result of a formalised process, but more the result of international risk analysis and consensus with stakeholders. Currently, there is no regular cost-benefit analysis, but studies have been carried out by experts after some outbreaks, as after the last FMD outbreaks in Mato Grosso do Sul to assess the efficiency of the control measures during the outbreak.

There is no real tool for disease prioritisation. However, the most important diseases (those with heavy economic impacts on animal production or major zoonoses) are covered by federal programmes. Some diseases are covered by State programmes in some States because of their local impact on animal production or on public health.

Implementation of animal health programmes

There are two kinds of federal programmes, whose rules are described in a *Manual de Legislação*, and in the MAPA website (www.agricultura.gov.br/animal/sanidade-animal).

- Programmes of prevention, control or eradication of specific diseases: FMD, bovine tuberculosis and bovine brucellosis, rabies, Transmissible Spongiform Encephalopathy (TSE), avian influenza, classical swine fever, equine infectious anaemia.
- Programmes of animal health control in species: small ruminants, poultry, bees.

The surveillance network in the country is based on 1505 LVUs (Local Veterinary Units). These units belong to the official VS and are in charge of organising animal programmes and surveillance on their territory. They also use the network of the 5 072 private veterinarians in the country. These practitioners can be "authorised or accredited" by the VS to be involved in official programmes for specific activities.

- To issue GTAs (*Guia de Trânsito Animal* - animal movement permission) for the movement of pigs and poultry from commercial holdings (in vertical systems), once they participate in training courses offered by MAPA and State VSs.
- To carry out diagnostic tests for some diseases that are under official control: bovine brucellosis, tuberculosis and equine infectious anaemia.

With 3 759 official veterinarians and 5 072 private veterinarians involved in animal health in Brazil, the animal health system is based on a balanced population of private veterinarians and official veterinarians. However, the density of the veterinary network is very different between States, with intensive animal production in the South and South East of the country, and the Amazonia forest with no livestock activities.

Biosecurity measures to protect the country are ensured by the federal government with the management of border posts and quarantine. A quarantine station exists on a Brazilian island for quarantine periods needed for some specific materials (such as embryos) or live animals to ensure their safety before introduction on the continent.

According to MAPA Legal Instruction No. 17 of 13 July 2006, livestock producers with bovines and buffaloes have to be registered in the SISBOV traceability system. There is no mandatory individual identification of the animals. However, every movement and key information items have to be registered: the birthplace, production system, movements, vaccination details, sales, and slaughter of all cattle either born in Brazil or imported from foreign countries. During movement, the animals must travel with a movement permit (GTA), which allows tracing movements of animals in case of an outbreak, and supports risk assessment.

The development of biosecurity measures at farm level depends on the level of organisation of the supply chain in each sector, and on the activities of the farmers' associations. Biosecurity measures are more developed in the poultry and pig sectors than in the beef sector. However, producers' associations try to promote good farming practices.

The cost-sharing of the control measures is defined for each programme, and is based on a private-public partnership with public contributions from federal and state governments, and contributions from the private sector.

The share of contributions has been defined in regulations, for each animal health programme. For instance, 50% compensation for culling or slaughtering for eradication of FMD is paid by the federal and state governments, and the other 50% by private funding. Vaccination for FMD is charged to the farmer in the area where control of FMD is based on vaccination. For prevention of bovine spongiform encephalopathy (BSE), compensation for culling all imported animals from BSE-risk countries is totally based on public funding. The contribution of each State also depends on its own policy. Some States, such as Santa Catarina, have a very ambitious animal health policy with a good level of compensation and some funding for specific animal health programmes for their State. For other States, animal health is a less important priority in their policy. The private contribution is based on private associations such as FUNDEPEC (Foundation for the Development of Agriculture) in several States. These foundations are in charge of collecting some levies on GTA movement permits, vaccines, slaughtering, etc. They can have different roles in the development of the animal health policy: contributions for compensation, support for extension programmes, co-ordination of the activities between farmers' association and veterinary services, support for investment in VS facilities in some States (Box 6.2). Their action is not limited to Animal Health Programmes, but they also support investment in livestock and agriculture.

A study in 2004 analysed the cost-sharing of the expenditure in Brazil (Dubois and Moura, 2004) (Table 6.1). This covered all expenditure for official programmes, mainly for the FMD programme. It showed that around 60% to 75% of the expenses are paid by the private sector. The States' contributions were around 10%, but with big differences between states. The federal contribution was around 12-15%, but could reach 29% in the case of outbreaks requiring more contributions.

Box 6.2. FUNDEPEC in Parana State: Example of activities

- Compensation for slaughtered animals for eradication of FMD, classical swine fever, Newcastle disease.
- Participation to define the sanitary strategy in the State.
- Information of Municipalities on their role of the UVL's functioning.
- Participation in the organisation of vaccination campaign.
- Communication campaign for promotion of vaccination against FMD
- Working group to develop traceability for pig production.
- Participation in international consultations, international meetings (OIE, PANAFTOSA), and organisation of visits to foreign countries (international fairs, or to develop trade).

For sanitary topics, this FUNDEPEC has created the CONESA (*Conselho Estadual De Sanidaria Agropecuaria*). It is a committee for consultation and co-ordination of sanitary programmes. There are 38 members: 17 from official services, and 21 representing private association of the different sectors.

Source: FUNDEPEC of Parana website (www.fundepecpr.org.br/?pag=relatorios).

Table 6.1. Expenditure on animal health by public and private sectors in Brazil, 1992-2003

Year	Expenditure on animal health (USD million)				Share of expenditure by source			
	Federal govern- ment	State govern- ment	Total public sector	Private sector	Total expendi- ture	Federal govern- ment	State govern- ment	Private sector
1992	7 665	2 666	10 331	74 651	84 982	9%	3%	88%
1993	7 292	1 013	8 305	75 883	84 188	9%	1%	90%
1994	23 068	3 009	26 077	94.09	120 167	19%	3%	78%
1995	39 033	9 981	49 014	143 034	192 048	20%	5%	74%
1996	18 845	23 036	41 881	90.13	132 011	14%	17%	68%
1997	26 657	20 289	46 856	120 518	167 374	16%	12%	72%
1998	23 214	16 831	40 045	98.94	138 985	17%	12%	71%
1999	31 699	22.61	54 309	96.25	150 559	21%	15%	64%
2000	52 741	19 579	72.32	124 268	196 588	27%	10%	63%
2001	53 869	18 494	72 363	113 292	185 655	29%	10%	61%
2002	17 581	17 016	34 597	113 371	147 968	12%	11%	77%

Source: Dubois and Moura (2004).

Outbreak management

The PANAFTOSA has worked with the countries of the continent to define emergency plans and propose a framework. The federal VS have defined in their legislation the common rules to manage FMD outbreaks. The main difficulty highlighted during the PVS evaluation, made in 2007, is the required adaptation of these rules with the specific local situations, taking into account the differences in the geographic situations and the means of communications in the 27 states. The official veterinary services of each state are responsible for the definition of the concrete procedures and for informing and training the veterinarians and the farmers. Notification of any suspected cases must be done to the official Veterinary Services within 24 hours of identification by the farmer or veterinarian. The suspected case must be recorded

in the information system within 12 hours after notification. The official State Veterinary Services take all the relevant decisions to confirm the case (sampling, test laboratory, epidemiologic inquiry) and to avoid the spread of the viral agent (ban of animal movements in the concerned area, surveillance of the animals, stop vaccination campaign).

Box 6.3. The management of the FMD outbreak in Mato Grosso do Sul in 2005

In October 2005, a FMD outbreak has been confirmed in a municipality close to the border of Paraguay. After the disease was confirmed, surveillance and epidemiological investigation actions were intensified and specific legal acts were published in order to, to ban the movement of animals and products that risked spreading FMD from the rural holdings and municipalities concerned, and to set up fixed inspection posts at strategic points, among other inspection actions.

All the movements during the 60 days preceding the probable beginning of the outbreak have been analysed to carry out inspection on farms holding animals coming from the banned area. Thirty-four outbreaks have been identified during the following months in the restricted area.

The strategy to eradicate the disease was based upon the elimination of susceptible animals in the outbreaks and in the herds related to these animals by direct or indirect contact, and upon the banning of trade and movement of susceptible animals and hazardous products. Six months were necessary to slaughter the animals due to the delay with the rain season. The compensation for culling and slaughtering was around USD 8 million for compensation for culling animals and to compensate the difference between the value of the animals and the price paid by the slaughterhouses. After elimination of the animals, sentinel animals free of vaccination have been placed to verify the absence of the virus and serological studies have been done to verify the absence of circulating virus. The conclusion was that there is no risk to spread outside the restricted area, but the virus could still be present in the restricted area.

In April 2006, Brazil had a new outbreak with epidemiological link with the previous outbreak. After the confirmation of the outbreak, the surveillance was intensified in all states in Brazil to confirm that it was possible to maintain their status. A High Surveillance Zone has been defined to implement stricter control measures as individual identification of animals, vaccinations inspected by official veterinarians, registration of the geographical location of rural holdings with susceptible animals. The Official Veterinary Services in the concerned UVLs with more staff and more means (cars, communication).

From April to November 2007, a serological study in all Mato Grosso do Sul State following a strict protocol was carried out to confirm the absence of circulating virus in the State.

On 28 July 2008, the State of Mato Grosso do Sul regained OIE recognition of FMD-free status. During this period, the MAPA had regularly informed international agencies and the Mercosur permanent veterinary committee to decide control measures in co-ordination with partners. Several missions supported Brazil to recover its sanitary status.

Source: Ministry of Agriculture (2008), Livestock, and Food Supply.

If the case is confirmed, MAPA must define and co-ordinate the actions to be undertaken, taking into account the sanitary status of the region involved, the assessment of the risk of dissemination of the viral agent, the evaluation of the region's vulnerability and receptivity, and the local veterinary service's response capacity, as well as the possible economic and social consequences. Actions may include sanitary slaughter, stamping out, emergency vaccination, and interdiction measures. The MAPA will define all the sanitary protection areas to avoid the spread of the diseases involving all the relevant administrative divisions (municipalities, states, or information of neighbouring countries). This means that the emergency plan is led by the federal level when the case is confirmed, co-ordinating or supporting the actions of the official State Veterinary Services.

Supervision is organised by the federal level with the presence of SFA in each State. The mission of this service is to verify that the federal animal health programmes are correctly implemented by the State VSs. The federal VS are developing a tool to assess the States' VSs following the experience and requirements of the OIE-PVS evaluation. The objective is to support each Federal Unit in strengthening their capacities. This supervision is an internal VS tool: there is no systematic diffusion of the results.

6.2 Concluding remarks

Animal health policy in Brazil is still dominated by the eradication of FMD, which is a big issue in an exporting country. The private sector is closely involved in the definition of the policy, through consultation at the federal level with regular forums on each animal sector, and at State level. The contributions for the animal health programme expenditures come mainly from the private sector through taxes collected by the foundations.

The organisation of the VS in Brazil is driven by the country's federalism. The federal level defines the common rules, and supervises the VS in each State in charge of implementing the animal health policy. However, each State can adapt the policy in its territory with complementary programmes or supports. This is necessary in a large country with different epidemiologic situations and different importances of livestock production. The PANAFTOSA programme plays an important role in the integration of animal health policy, and especially in sharing information and developing transparency at the continental level. The SIVCONT database is a key tool for communication, information sharing and risk assessment in each country.

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Chapter 7.

Canada¹

This chapter describes important features of the animal disease management system in Canada. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The second section analyses compensation schemes and the system of incentives, including institutions, compensation practices, financial structures, and incentives for notification and prevention. The concluding table summarise the main characteristics and challenges.

Canada has a large total area of 9 093 507 km², and about 34 030 600 inhabitants, giving a population density of 3.7 inhabitants per km², among the lowest in the world. Its physical geography is widely varied, but boreal forests prevail throughout the country, ice is prominent in northerly Arctic regions and through the Rocky Mountains, and the relatively flat Canadian Prairies in the southwest facilitate productive agriculture. The Great Lakes feed the St. Lawrence River (in the southeast) where lowlands host much of Canada's population.

Canada has a strong democratic tradition upheld through a parliamentary system in a federation composed of ten provinces and three territories. Provinces have more autonomy than territories, and are responsible for most of Canada's social programmes; together, they collect more revenue than the federal government. Using its spending powers, the federal government can initiate national policies in provincial areas; the provinces can opt out of these, but rarely do so in practice. Equalisation payments are made by the federal government to ensure that reasonably uniform standards of services and taxation are kept between the richer and poorer provinces.

Canada is a major agricultural producing and exporting country, with a population of more than 14 million head of cattle, 12 million pigs, around 800 000 sheep, and more than 641 million chickens and 20 million turkeys (Statistics Canada, 2011a). Of the 229 373 Canadian farms that existed in 2006, 6.4% were engaged in dairy cattle and milk production, with an important share of output exported, while 26.6% – by far the largest share of any Canadian crop or livestock sector – were dedicated to beef cattle ranching and farming, including feedlots (Statistics Canada, 2011a). Canada is the:

- tenth largest producer of beef meat in the world, and the seventh leading exporter; and
- sixth largest producer of pig meat, and the third leading exporter.

Alberta accounts for approximately 40% of the cattle for meat industry. About 81% of Canadian dairy farms are located in Ontario and Quebec, 13% in the Western provinces and 6% in the Atlantic Provinces. The Canadian dairy cattle population totals 1.4 million, and the typical Canadian dairy farm has 72 cows.

The Canadian Food Inspection Agency (CFIA) is the agency responsible for the administration and enforcement of, among several other pieces of agricultural legislation, the Health of Animals Act, including its compensation provisions. With over 7 000 employees and 160 field offices, the CFIA is a sizeable organisation tasked with ensuring safety in the food production chain – from primary production to retail level – and the livestock population. It manages animal inspection and quarantine programs across Canada and its president reports to the minister of Agriculture and Agri-Food Canada (AAFC) who “is responsible for and has the overall direction of the [Canadian Food Inspection] Agency” (Canadian Food Inspection Agency Act, 1997).

7.1 Prevention and control system

The sanitary situation in Canada is good, and the country is free from certain serious diseases such as the swine fevers, foot-and-mouth disease (FMD), highly pathogenic avian influenza (HPAI) and Newcastle disease. Nevertheless, there have been several epizootic outbreaks in recent years:

- Avian influenza (AI): since 2004, when there were over 50 outbreaks of HPAI in British Columbia, and control measures included the destruction of nearly 14 million birds, four localised notifiable AI outbreaks have been successfully controlled and eradicated, with re-establishment of Canada's disease-free status

- Bluetongue: there have been five known occurrences of bluetongue in Canada – all in one valley – over the past thirty years. The country is currently free from bluetongue.
- Bovine Spongiform Encephalopathy (BSE): Canada's first case of BSE in a domestic animal was found in 2003, and triggered substantial trade interruptions which led to industry losses of nearly CAD 6.3 billion (Antón *et al.*, 2011, p. 49). The six-year period from 2005 to 2010 saw at least one BSE case annually, and 15 cases, nearly 400 destructions, and almost 300 slaughterings in total (OIE WAHID Interface, 2011).
- H1N1 influenza: The virus was confirmed on a pig farm in Alberta during the global pandemic in 2009. Canada was the first country to detect and report this influenza strain in pigs. This case highlights the efficiency of the surveillance system and its transparency.

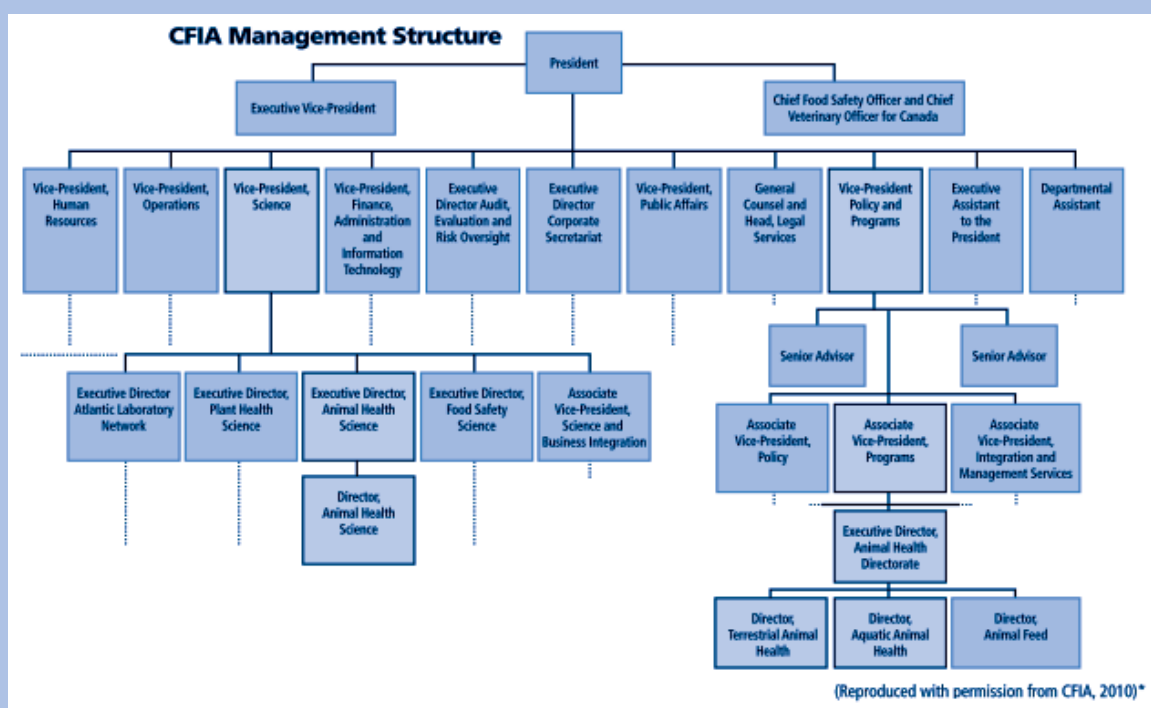
The CFIA is the lead federal agency responsible for animal health within the country (Box 7.1). It is the largest science-based regulatory body in Canada, with a mission to: protect Canadians from preventable health risks; protect consumers through a fair and effective food, animal and plant regulatory regime that supports competitive domestic and international markets; sustain the plant and animal resource base; contribute to the security of Canada's food supply and agricultural resource base; and provide sound agency management. It has responsibilities flowing from 13 federal statutes and 42 sets of regulations, and is responsible for delivering all federally mandated programmes in these areas. Under the CFIA's management, there is a culture of high reactivity, with an important task force and high international transparency. The provinces and territories assist the federal level with the implementation of national animal health policies and develop specific programmes for other production-limiting diseases which are not federally reportable.

The CFIA is led by its President, who reports to the Minister of Agriculture and Agri-Food. The Agency has an integrated governance structure whereby all branch heads have specific accountabilities that contribute to the achievement for each strategic objective. The CFIA employs about 7 500 people in a wide range of scientific, technical, operational and administrative positions. In 2011, 1 524 full-time equivalents were dedicated to Animal Health. The CFIA employees are stationed in field offices, laboratories, ports of entry and food processing facilities across the country. Created in 1997 by the Canadian Food Inspection Agency Act and reporting to the Minister of Agriculture and Agri-Food, the CFIA delivers inspection and quarantine programmes related to foods, plants and animals in 18 regions and 160 field offices across Canada.

The CFIA has regulatory capacities (such as in biotechnology), verifies industry compliance with regulations, provides certification programmes for exports and imports, represents the Government of Canada in multilateral international science-based standard-setting bodies such as the World Organisation for Animal Health (OIE), and operates emergency responses. It is involved in the overall protection of animal and plant resources and manages disease outbreaks (plant and animal) which have implications at the farm level for the farms involved in the outbreak. The CFIA gathers information about disease status (in animals and plants) through surveillance, testing and co-operation with provincial bodies and producer groups. It leads the National Animal Health Strategy, is responsible for the implementation of the Health of Animals Act (HAA), and has the authority to communicate to the government the appropriate measures to be taken in each case. The CFIA's programmes are also focused on providing oversight of production inputs, such as animal feeds and veterinary vaccines, to verify that controls are in place to prevent the spread of animal diseases. The Policy and Programmes Branch of the CFIA contributes to guiding policies and risk management options, and the Science Branch provides research and advice for senior management.

Provincial and territorial governments also have a major role in animal health. Each provincial/territorial government has an Office of the Chief Provincial Veterinarian (or equivalent) responsible for areas such as animal health disease surveillance, food safety, and animal welfare. In addition to collaborating with national organisations and programmes involved in animal health surveillance, several provinces and territories have provincial surveillance organisations and programmes (for example, Alberta Veterinary Surveillance Network; Ontario Animal Health Surveillance Network, *Réseau d'alerte et d'information zoosanitaire* (RAIZO) in Quebec...). Some diseases not covered by any federal programme are provincially or territorially reportable, and a province/territory may have a specific programme for this disease; for example, there is a voluntary programme for John's disease in Quebec. There is strong integration and co-operation between the levels. The responsibilities are clearly defined, either by regulation or by memorandum of understanding.

Box 7.1. Organisation of the CFIA



Services in grey are involved in risk analysis for animal health.

Sources: CFIA (2011d), Evans *et al.* (2003).

Risk assessment

The CFIA is the main federal institution responsible for both animal health risk assessment and risk management. As part of the CFIA Science Branch, the Animal Health Risk Assessment (AHRA) unit conducts risk assessments, predominantly relating to imports (and initiated by private stakeholders) (Figure 7.1) but also including issues relating to the animal-human health interface, or regulatory assessments initiated by the CFIA (for example, BSE and H1N1 risk assessments). Animal health risk analysis at the CFIA is described in the Protocol of the Animal Health and Production Division and Animal Health Risk Analysis Science Advice and Biohazards Division. Much of these risk analyses are conducted using a qualitative approach.

Other organisations (government, industry and academic) also contribute to the risk assessment process at the CFIA, and conduct or sponsor independent risk assessments. For example, a study on FMD was prepared for the Canadian Animal Health Coalition and funded by the Private Sector Risk Management Partnerships programme, a federally funded initiative that encourages the expansion of private sector risk management solutions to address producer-perceived gaps in government-sponsored programmes or products offered by the private sector. They can also provide expertise and be involved in CFIA risk assessment, or carry out their own risk assessment for their needs. Scientific advice, scientific opinions and similar documents provide decision-makers with information on a particular subject, outside of the formal risk assessment process.

Although the CFIA is responsible for both risk assessment and risk management, its organisational arrangement, with the Science Branch responsible for risk assessment, and the Service and Policy Branch in charge of risk management decision-making, ensures a minimum of independence, and that the risk assessments are not influenced to fit prior regulatory conclusions.

For risk assessment, the CFIA uses data from the Canadian Animal Health Surveillance Network (CAHSN) of federal, provincial and university animal health diagnostic laboratories established over a four-year period to improve the capacity to detect emerging animal disease threats in real time. The CAHSN particularly focuses on those animal disease threats that could have zoonotic potential, and provides a rapid response to minimise the human health and economic risks to Canada. Led by CFIA's Director of the National Centre for Foreign Animal Disease, the Canadian Public Health Laboratory Network combines surveillance data received from many sources and simultaneously alerts both human and animal health authorities in other jurisdictions within Canada when potential animal disease threats are identified.

The key outputs of the CAHSN are:

- A national early warning system for animal disease threats to the food supply, food safety or public health
- A federal-provincial laboratory network for the rapid diagnosis of serious infectious animal diseases
- An information-sharing network linking federal and provincial agencies and departments of animal and human health.

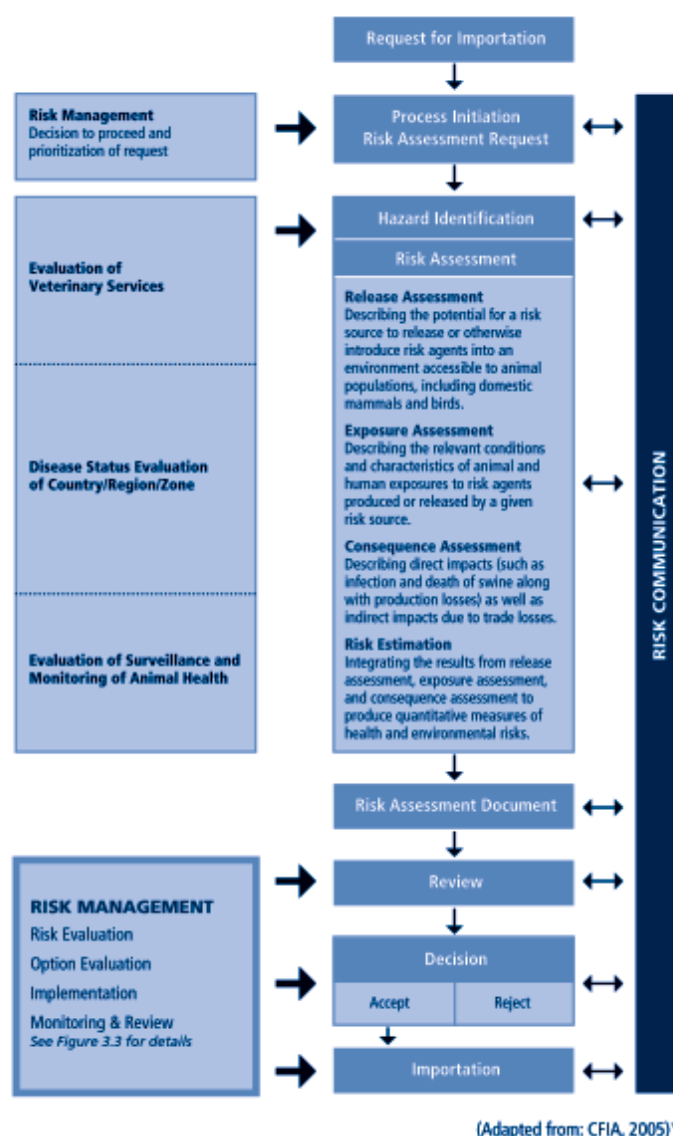
CAHSN laboratories collaborate with the Canadian Network for Public Health Intelligence (CNPHI) to establish rapid communication and identification of emerging animal disease issues. This newly established network increases the surge capacity of federal and provincial laboratories to rapidly diagnose serious and infectious animal diseases. By combining their diagnostic surge capacities with those of provincial and university laboratories that have diagnostic capabilities for foreign animal disease, the response to an outbreak is being enhanced. For inter-operability, laboratories use common protocols and reagents. Technical and scientific staff also exchange, participate and share expertise.

The CAHSN bolsters Canada's domestic early warning surveillance capacity to detect new and emerging diseases of animals that could affect animal health, the food supply or public health. It brings together animal disease surveillance information from many sources – veterinary practitioners, veterinary diagnostic laboratories and animal health agencies – so that baselines can be established and trends identified. By amalgamating information gathered from surveys, syndrome surveillance and rumour reports from the

field, tracking the on-going animal health status of the country is improved. The provinces often have their own surveillance network (e.g. the Alberta Veterinary Surveillance Network), which are part of the CAHSN for laboratories. They support national surveillance and report any important disease as it occurs.

Some specific disease surveillance programmes exist (e.g. CFIA has enhanced its avian influenza surveillance for commercial poultry flocks in Canada with the launch of the Canadian Notifiable Avian Influenza Surveillance System (CanNAISS). In addition, close collaboration exists between the CFIA and Canadian Cooperative Wildlife Health Centre which undertakes avian influenza surveillance in migratory birds and water fowl as an early warning system for circulating virus in wild bird reservoirs.

Figure 7.1. Import risk analysis for animals and animal products at the CFIA



Source: Council of Canadian Academies, 2011.

In the CAHSN, there is no integrated database, but the information (alerts, charts, ...) is shared between the different actors within the framework of a series of memoranda of understanding, which ensures the confidentiality of the data. However, the interconnections of the different databases are being developed to increase the sharing of information, analysis and the capacity for timely emergency response. Industry-led animal identification systems currently exist for cattle, bison and sheep, with those for other species in development. The CFIA enforces national identification requirements for these sectors under the Health of Animals Regulations, and the provinces and territories are integral to the implementation of animal identification within their jurisdictions (CFIA, 2011c).

Decision-making

The Health of Animals Act is a powerful piece of legislation which gives full authority to the CFIA to take the needed measures in case of an outbreak. The CFIA has the authority to act on the basis of suspicion, respecting the precautionary principle. If there is any doubt of a serious notifiable disease, the CFIA may decide to take preventive measures (animal culling, farm quarantine, ...).

The federal legislation is strong as regards animal transboundary diseases and zoonotic diseases. Provinces/territories work in collaboration with the federal level for these diseases. Veterinarians and animal owners are required by law to immediately notify the District Veterinarian of reasonable suspicion of any serious Federal Animal Disease. When a CFIA district veterinarian determines that a disease is present or suspected on a farm, he or she may issue an "order for destruction", which outlines what must be destroyed. Provinces may have specific programmes for non-federal diseases (e.g. Johne's disease, in Quebec).

There are multiple formal frameworks for consultations and collaborations with stakeholders, enabling a multi-level engagement. These include the following.

- The Minister's Advisory Board.
- The Expert Advisory Committee to the CFIA.
- The Consumer Association Roundtable chaired by the Chief Food Safety Officer/ Chief Veterinary Officer of Canada (for dialogue between the CFIA and Canadian consumers, with meetings at least twice a year).
- The National Farmed Animal Health and Welfare Council, formed as an advisory council by the Federal-Provincial-Territorial Regulatory Assistant Deputy Ministers of Agriculture Committee, with participants from the Council of Chief Veterinary Officers, the CFIA, the farmed animal industry, and the Canadian Animal Health Coalition. It reports to all stakeholders.
- The Council of Chief Veterinary Officers.
- The Council of Chief Medical Officers of Health.
- The Federal/Provincial/Territorial Ministers, Deputy Ministers and Assistant Deputy Ministers Committees.
- The Agriculture and Agri-food Canada Value Chain Roundtables (cattle, swine, small ruminants, the feathered group, etc.)
- There are also regular meetings of technical committees with each of the major industry associations such as the Dairy Farmers of Canada, the Canadian Cattlemen's Association, the Canadian Pork Council, the Chicken Farmers of Canada, the Canadian Poultry and Egg Producers Council, and the Canadian Veterinary Medical Association.

The Canadian Animal Health Coalition is a non-profit organisation serving Canada's farmed animal industry. The association represents its members, and participates in the National Farmed Animal Health and Welfare Strategy (Box 7.2) and in other programmes to ensure good animal health in Canada. The CFIA has drafted a *Consultation Policy and Framework* (www.inspection.gc.ca/english/agen/consult/dpolrece.shtml) which demonstrates the Agency's continued commitment to its effective consultation with stakeholders, and aims to bring consistent approaches to such consultation. These consultation processes maintain confidence and transparency between the Government, the industry and the consumers. The results are a consensus on the strategy and the objectives, and clear memoranda of understanding to share the responsibilities and the information.

**Box 7.2. The National Farmed Animal Health and Welfare Strategy:
A common vision between public authorities and private sector**

The result of this advisory committee involving private and public partners is the definition of strategic vision for 2009-2015. The following strategic outcomes have been identified:

- Improve capacity to avoid threats and anticipate opportunities;
- Improve capacity to respond to threats and create opportunities;
- Improve public confidence in Canada's farmed animal health system;
- Improve industry viability;
- Improve market access;
- Improve capacity to protect public health;
- Improve farmed animal care and welfare; and
- Improve capacity to protect ecosystem health.

Two critical elements have been defined with priorities, recommended actions and expected results for each component.

- The governance of the animal health policy aims at developing collaboration for more efficient decision-making. "The essential feature must be collaboration amongst all the major stakeholders in farmed animal health and welfare in Canada, namely the farmed animal industry, the federal government, provincial/territorial governments, the veterinary community and other service providers."
- Infrastructure/system capacity has the following ten components: anticipation and agri-intelligence, research and innovation, future leader development, disease management, identification and traceability, zoning and biosecurity, emergency response and recovery, data management, financial risk management, regulated biologics and pharmaceutical products.

The Canada-United States Consultative Committee on Agriculture (CCA) provides an ongoing process to enhance the management of bilateral agricultural trade relations. The semi-annual meetings of the CCA provide a high-level forum to strengthen agricultural trade relations between Canada and the United States of America through co-operation and co-ordination on matters related to agriculture. There is also a tripartite animal health committee with Canada, the United States and Mexico linked to the Sanitary and Phytosanitary (SPS) provisions of the North American Free Trade Agreement (NAFTA). This committee meets at least once a year. These tools facilitate co-ordination between the different countries' governments in the area of animal health. The associations representing stakeholders hold discussions with their own governments to promote their point of view before consultations between the nations.

As much as possible, the CFIA tries to negotiate agreements based on zoning and compartmentalisation principles, recognition of emergency response protocols. It conducts joint simulation exercises and transparent information exchange in anticipation of disease

occurrences with its NAFTA trading partners, in order to minimise trade disruptions and the economic consequences of suspected or confirmed disease events.

When significant regulatory initiatives are proposed, a major cost-benefit analysis is completed, according to the *Canadian Cost Benefit Analysis Guide* (www.tbs-sct.gc.ca/ri-qr/documents/gl-ld/analys/analys00-eng.asp). This guide is provided for federal departments and agencies as they perform cost-benefit analyses to support regulatory decisions. Most of the time, these analyses are mainly qualitative, and are available for decision-makers in relation to regulatory and legislative proposals. However due to Cabinet confidence provisions, they are not routinely made public. Some cost-benefit studies are also carried out by experts involving different partners for some key issues. For instance, such a study was prepared by the Animal Health Coalition in 2002 on the “Economic Impact of a Potential Outbreak of Foot and Mouth Disease in Canada”.

Implementation of animal health programmes

The animal health programmes depend on the type of disease, with three categories defined at the federal level for disease notification (CFIA, 2011a).

Regarding animal health policies, there are some federal diseases, for which there is a federal programme, and non-federal diseases for which there may be some programmes at province/territory level, and which may be reportable.

- **Reportable diseases** are outlined in the Health of Animals Act and Regulations, and are usually of significant importance to human or animal health or to the Canadian economy. Animal owners, veterinarians and laboratories are required to immediately report the presence of an animal that is contaminated or suspected of being contaminated with one of these diseases to a CFIA district veterinarian. Control or eradication measures are then applied immediately (e.g. BSE, brucellosis, tuberculosis, FMD, scrapie).
- **Immediately notifiable diseases** are usually exotic to Canada, and there are therefore no programmes of specific domestic disease control or ongoing eradication for them, but there are surveillance and monitoring programmes within the country and at the border. The CFIA can undertake control measures for such diseases when notified of their presence in Canada. This category also includes some rare indigenous diseases. A herd or flock of origin must be certified as being free from these diseases in order to meet the import requirements of trading partners (e.g. Hendra virus, Nipah virus, West Nile fever).
- **Annually notifiable diseases** are diseases to be declared in the OIE report. Usually, these are endemic production-limiting diseases in the country for which vaccination or treatments are available, but are not classified as reportable or immediately notifiable (e.g. blackleg, leptospirosis, BVD)

There are approximately 800 veterinary positions at the CFIA, who are considered to be part of the animal health capacity (although some of them may work mainly on food safety), and 2 226 private veterinarians working in animal health in Canada. The private veterinarians may be accredited: the *Accredited Veterinarian Agreement* is a legal instrument authorizing licensed private veterinarians to perform duties such as completion of international health certification under the authority of *Health of Animals Regulations*. Veterinarians wishing to perform duties under the CFIA's National Accredited Veterinarian Programme must enter into an agreement with the CFIA. From time to time, the CFIA may offer specific technical and non-technical training to accredited veterinarians, whose work is paid by the private sector. The private veterinarians are under the jurisdiction of the respective provincial veterinary licensing body, but they have strong engagement with animal health programmes through their professional obligations (notifications, etc.).

Industry-led animal identification systems currently exist for cattle, bison and sheep. The CFIA enforces identification standards and requirements for these sectors under the Health of Animals Regulations, and the provinces and territories play an integral role in the implementation of animal identification within their jurisdictions.

The CFIA develops national biosecurity standards, protocols and strategies for livestock, poultry and aquaculture production in collaboration with producer organisations, provincial/territorial governments, and academia (CFIA, 2011b). On the CFIA website are the national farm-level biosecurity standards for the sheep industry, the goat industry, the dairy sector, the poultry industry, etc. Some initiatives to promote biosecurity measures can be developed at the Province level, e.g. the Ontario Livestock and Poultry Council (OLPC), the Growing Forward (Biosecurity Farm Service Provider) programme in Alberta.

Outbreak management

In case of outbreaks concerning a disease notifiable at the federal level, an emergency response is organised as follows (www.inspection.gc.ca/english/animal/heasan/fad):

- The private veterinarian who identifies the suspected case informs immediately the district veterinarian. The suspicion is confirmed with the support of a CAHSN laboratory member.
- Once a firm suspicion is established, the practitioner remains on the suspect premises until relieved by the CFIA veterinarian, and undertakes the first biosecurity measures to avoid disease spread, and in the case of a zoonosis to protect the health of the people in the vicinity of the herd or the flock.
- In the case of an outbreak of an FAD (foreign animal disease), a designated emergency response team is mobilised to a Field Emergency Operations Centre (FEOC) to control the spread and eradicate the disease. Operationally, this team is made up of units with specific tasks: diagnostic, trace-out, movement control, evaluation, destruction and disposal, and cleaning and disinfection.
- Relevant control measures (e.g. quarantine, differential zoning to control movements, disposal, cleaning and disinfection) are defined by the CFIA veterinarian. The private veterinarian can be involved in these activities.
- Strong co-ordination with the different institutions is immediately organised through an Incident Command System (ICS) implemented at national and regional level to manage the emergency. The operations at farm level are led by the CFIA staff.
- Communication is organised quickly through engagements with stakeholders (e.g. industry, farmers) to make them aware of the situation and the control measures to limit the spread of the diseases. The public is also regularly informed about the situation.

The CFIA regularly reviews its policies, programmes and services, and lessons learned exercises are standard operating procedure following any declared emergency. These reviews are done through audits and evaluations, and are available on the CFIA website. The CFIA is audited on different functions and themes every year. In 2010, the Terrestrial Animal Health-Epidemiology and Surveillance Section was audited to provide assurance that the management control framework supports CFIA Terrestrial Animal Health programming. The audit examined the governance, risk management and control processes in place for the design and delivery of national animal disease surveys. The surveys within the scope of this audit included the Canadian Notifiable Avian Influenza Surveillance System (CanNAISS) and the Bovine Serologic Survey (BSS).

7.2 Compensation schemes and incentives

When disease control measures are ordered in response to an outbreak, Canada compensates livestock holders for their destroyed/slaughtered animals and related products, as well as for incurred disposal costs, through a compensation scheme administered by the Canadian Food Inspection Agency (CFIA). Additional financial transfers to affected livestock holders can be made through several programmes administered by Agriculture and Agri-Food Canada (AAFC). Whereas the CFIA-administered scheme only compensates holders for direct losses, the AAFC programmes may partially reimburse business interruption and other extraordinary losses (CFIA, 2011d; Ritz, 2011).

The ability of livestock holders to privately insure risks associated with epidemic diseases appears minimal. In 2006, Stephen and Epps (pp. 160, 161) described a sector “unlikely to get involved with such [drought or disease epidemic] risks”, and an August 2011 interview with several CFIA and AAFC officials confirmed the continued scarcity of private insurance products. While the Canadian government has made efforts to engage the private sector and incentivise product development (e.g. through the Private Sector Risk Management Partnerships programme), farmers still rely on the public risk management programmes.

All sampling and testing conducted in the carrying out of federal disease control programmes and investigations is publicly funded. Vaccinations are paid by the private sector. Animal health compensation for animals ordered to be destroyed under federal disease control programmes is publicly funded. For animals and other things (such as contaminated feed or animal products) ordered to be destroyed, the CFIA bases the compensation amounts on the market value at the time of destruction, up to a maximum amount as stipulated in the Compensation for Destroyed Animals Regulations. After any animal destruction, a compensation assessment team (usually one veterinarian of the CFIA and two other evaluators, one chosen by the farmer and the other by the CFIA) evaluates the value of the animals. If the farmer thinks the amount awarded for compensation is unreasonable, he may appeal the decision within three months of the evaluation.

The CFIA compensation is paid from the consolidated revenue fund of the federal government, and is not voted or allotted as a line item in the CFIA’s annual budget. This serves to avoid any financial constraints on the CFIA in case of crisis. The compensation is not systematically applied to all diseases; it is engaged if the country’s biosecurity is threatened. There is no cost-sharing with the private sector for this compensation.

Beyond the CFIA’s compensation, other financial assistance (subsidies) may be available through programmes administered by AAFC (e.g. a programme against circovirus in pigs) and, in some cases, provincial or territorial governments. Costs and losses considered by these programmes may include business disruption, income loss and other extraordinary costs incurred due to disease. AAFC may also develop programmes to help develop new tools (e.g. subvention for the detection of tuberculosis on a blood sample).

While private insurance for livestock is available, its use is largely limited to high-value animals. As a result, private insurance schemes for animal diseases and producer-funded models are not well developed. However, some examples exist:

- The Canadian sheep federation has proposed blue tongue insurance for sheep (new commercial insurance programme endorsed by the Canadian Sheep Federation with the assistance of AAFC’s Private Sector Risk Management Partnerships programme).
- Industry partnerships have developed producer-funded, private-sector-delivered insurance plans for broiler-breeders (Poultry Insurance Exchange, PIE), salmonella in the table egg sector (national *Salmonella enteritidis* (Se) reciprocal programme),

- Avian influenza insurance in Ontario and British Columbia, and blue tongue in sheep (CSF-CFM, 2008).

The advantages of these insurance schemes for the farmers are that: (i) they clearly state exactly what is being covered and under what circumstances; (ii) in the case of an outbreak, farmers receive their compensation at defined prices without delays for government decisions and evaluations.

Institutional framework

The compensation scheme administered by the CFIA is purely public in nature – its funding does not entail cost-sharing with the livestock industry. The scheme is authorised by the Health of Animals Act, Section 51 of which permits the AAFC minister to compensate the market value of compulsorily destroyed animals.² In turn, Section 55 authorises the minister to set out maximum compensation amounts for destroyed animals and products. These have been established through attachment of a schedule to the Compensation for Destroyed Animals Regulations (Ritz, 2011).³

With regard to the compensation scheme operated by the CFIA, notable stakeholders include CFIA veterinarians and livestock holders. Acting early in the process, CFIA district veterinarians are authorised to issue destruction orders once they have determined the presence or suspected presence of a disease at a holding. These orders specify the animals and/or products to be destroyed. The district veterinarians then either – depending on the context, e.g. the number of animals involved – identify a single compensation evaluator or assemble an assessment team, which generally comprises a CFIA veterinarian as well as one evaluator chosen by the owner and another by the CFIA. The evaluators derive the market value of the animal(s) in question and generate a compensation evaluation form which is then sent to livestock holders for their acceptance or appeal (CFIA, 2011d).

Livestock holders are involved at several points in the compensation scheme. Not only might they assist, through representative organisations, in development of the market value assessment tools (see below for details on the assessment rules),⁴ but they are also assigned reporting responsibilities by the Health of Animals Act. Specifically, “immediately” after becoming aware of the presence of a reportable disease, livestock holders need to report its existence to the closest veterinary inspector (Health of Animals Act, S.C. 1990, c. 21, Section 5). And, when visited by compensation evaluators, holders must present evidence supporting animal value claims (CFIA, 2011d).

The compensation scheme aims to help “...control the spread of animal diseases, including those that would have a significant economic impact, by encouraging early reporting” (Ritz, 2011). To that end, the scheme is authorised to compensate livestock/property holders for three categories of losses: animals ordered destroyed; destroyed items such as contaminated feed and animal products; and the disposal costs of destroyed animals. Table 7.1 offers an overview of the scope of compensation available under the compensation scheme. As has been mentioned and is suggested by the table, the scheme only indemnifies direct losses imposed by disease control measures; it does not compensate for consequential or business interruption losses.

The market value assessment can be performed via either of two methods. The first is employed for commonly traded animals such as cows and sheep. Since a market exists for these animals, the value assessment is based on a determination of how much an equivalent replacement would cost on that market. It takes into account a given animal’s age, genetic background and production records, among other factors. The second method is utilised in the effective absence of a functioning market for the animal in question. Examples provided by the CFIA (2011d, p. 2) include egg-laying and hatching-egg birds. Here, the replacement

value is still the sought-after figure, but it is determined based on an economic formula that accounts for the production or life cycle phase the animal had achieved at the time of its destruction and the associated “grow-out” costs.⁵

Table 7.1. Scope of compensation available through the CFIA scheme

Loss category	Eligibility	Overview of the scope of compensation and assessment methods
Destroyed animals	1) The animal is destroyed under the Health of Animals Act or dies after its destruction has been ordered; or 2) The animal dies or must be destroyed due to injury caused by an inspector/officer during testing, treatment, or identification; or 3) The animal is reserved by authorities for experimentation.	Compensation is based on the assessed market value (the value the animal would have had at the time of its evaluation by the Minister if it had not been required to be destroyed) of the animals destroyed, up to the maximum amounts set in the Compensation for Destroyed Animals Regulations, minus any value received through carcass salvage. The market value is derived by a compensation assessment team or, sometimes, a single evaluator. The livestock holder can appeal the evaluation. The compensation “amounts are intended to reflect the reasonable depreciated value that an owner could expect to receive for the animal or thing on the current Canadian market” (CFIA, 2011d).
Other destroyed items	Eligible items include, <i>inter alia</i> : 1) Contaminated feed ordered destroyed; and 2) Animal products ordered destroyed.	Compensation for a given item is based on that item's assessed market value at the time of its destruction, up to a prescribed amount.
Animal disposal costs	Compensation-eligible costs are those which are: 1) Linked to the disposal of animals; and 2) Permitted by the Compensation for Destroyed Animals Regulations.	If an animal is ordered to be destroyed or slaughtered and all procedures are appropriately followed by its owner, compensation is payable for reasonable costs incurred by the owner for: 1) Transporting the animal to the destruction facility; and 2) The animal's destruction or slaughter. If the carcass must also be disposed of, compensation is additionally payable for reasonable costs incurred by the owner for: 1) Transportation to the place of disposal; 2) The cleaning/disinfection of the transport vehicle; and 3) (In addition to destruction costs), disposal expenses or services.

Source: CFIA (2011d); Compensation for Destroyed Animals Regulations (SOR/2000-233); Health of Animals Act 1990.

The maximum values listed in the Compensation for Destroyed Animals Regulations schedule, indicative examples of which are provided in Table 7.2, constitute concrete limits on compensation. Thus, an evaluation that would otherwise place an animal's market value above the relevant limit yields that animal's owner no more than the maximum value. However, generally, compensation payments fall below the maximum values, as they reflect reasonable depreciation levels. If a holder feels that a compensation evaluation has produced a figure too far below the maximum level, an appeal (federal court-based) must be made within three months of receipt of the evaluation form.⁶ In cases where an appeal is not pursued, it normally takes six to ten weeks for payment to reach the livestock holder.

Notably, smallholders and non-commercial holders/hobby farmers are compensated in precisely the same manner as commercial holders because compensation is payable for any animal – from production livestock to zoo animals and other exotics, as well as family pets⁷ – ordered destroyed for disease control purposes under the Health of Animals Act.

As introduced above, the legislation underlying the compensation scheme does not specify an hour- or day-based time limit in which livestock owners or caretakers must notify

reportable disease incidents to veterinary inspectors. Rather, transmission of notification “immediately after” such an incident is required (Health of Animals Act, 1990, Section 5). Given that the AAFC minister can partially or fully withhold compensation for violations or offences committed under the Health of Animals Act (1990, Section 54), this legal reporting requirement is backed by potential financial penalisation.⁸ Additionally, there is effectively *de facto* encouragement of early notification, because animals which die from a disease prior to the issuance of an applicable destruction order are not indemnified.⁹

Table 7.2. Maximum compensation amounts for certain livestock species

Livestock species	Maximum compensation amount (CAD)	Prior (i.e. pre-March 2011*) maximum values for poultry
Cattle (<i>Bos taurus</i> and <i>Bos indicus</i>) registered	8 000	n.a.
Sheep (<i>Ovis aries</i>) registered	1 200	n.a.
Goat (<i>Capra hircus</i>) registered	1 000	n.a.
Swine (<i>Sus scrofa</i>) registered	5 000	n.a.
Horse (<i>Equus equus</i>) all except those ordered destroyed due to Equine Infectious Anaemia	8 000	n.a.
Chicken (<i>Gallus gallus</i>) for egg production	30	8
Chicken (<i>Gallus gallus</i>) parent breeder – for egg production	60	18
Chicken (<i>Gallus gallus</i>) parent breeder – for meat production	60	24
Turkey (<i>Meleagris gallopavo</i>) for meat production	70	35
Turkey (<i>Meleagris gallopavo</i>) parent breeder	250	90

* The Regulations Amending the Compensation for Destroyed Animals Regulations, which increase the maximum compensation amounts for poultry, took effect in March 2011 (Ritz, 2011).

Source: *Chicken Farmer* (2011); Compensation for Destroyed Animals Regulations (SOR/2000-233).

The CFIA compensation scheme does not differentiate its procedures between “limited” and “catastrophic” outbreaks, using the same methodological approach in both instances. Nonetheless, the CFIA (2011d, p.1) has noted the possibility that emergency situations might result in a “slightly different” compensation process designed to speed up disease response efforts. This slight possibility aside, the main potential for differentiation between small- and large-scale livestock epidemics rests on Canada’s somewhat frequent implementation of temporary or *ad hoc* financial support programmes in the agricultural sector (Antón *et al.*, 2010, p. 13). At least with respect to costs imposed by livestock diseases, these programmes tend to address producers’ consequential rather than direct losses. A livestock-industry-specific example of such an *ad hoc* programme is the substantial distribution of funds at the federal and provincial levels which followed the 2003 BSE outbreak (Antón *et al.*, 2011; Statistics Canada, 2011b). Large-scale outbreaks might also be differentiated by increased financial transfers provided through the Business Risk Management (BRM) suite of programmes managed by AAFC.

Box 7.3. The Business Risk Management (BRM) suite of programmes

In addition to the compensation provided through the CFIA for direct losses resulting from livestock or product destruction, the AAFC has the potential to provide financial assistance to disease-affected livestock holders through the Business Risk Management (BRM) programmes. Generally speaking, there is a financial impact threshold below which most BRM programmes do not respond. However, these programmes do respond to "moderate", as well as severe, impacts on producers. The BRM suite comprises four main programmes – AgriInvest, AgriStability, AgriRecovery, and AgriInsurance – as well as an Advance Payments Programme. With the exceptions noted below, the general funding rule for the BRM programmes is that their costs are shared on a 60/40 basis between the federal and provincial/territorial governments.

AgriInvest effectively comprises contribution-matching savings accounts (funded entirely by the federal government). Though AgriInvest accounts are intended to assist with small income declines, withdrawal of the funds is flexible so they could be used to counteract a portion of the costs incurred as a result of a livestock disease outbreak.

AgriStability serves as an income stabilisation programme applicable when farm income more substantially declines relative to the average income of previous years. AgriStability takes into account the impact of, e.g. a livestock disease incident, on the whole-farm operation. Thus, a disease event would need to cause a farm's programme margin to fall 15% below the reference margin to trigger an AgriStability payment (AAFC, 2008).

AgriRecovery provides a framework for the co-ordination and tailoring of federal and provincial/territorial responses to individual agricultural disasters, including diseases. The programme's goal is to fill gaps left by other BRM and Growing Forward programmes with targeted, case-specific programming. Following a disaster-type event, an affected province or territory can ask for an AgriRecovery assessment, which will then be jointly conducted by the federal and the relevant provincial/territorial government(s). An assessment explores the following questions: 1) Does the event meet federal-provincial-territorial disaster criteria under the AgriRecovery framework? 2) What level of assistance do agricultural producers need to recover from the event's impact? 3) How have and will existing programmes assist recovering producers – what have CFIA-administered compensation pay-outs already done in terms of indemnifying producers' losses and what will the other BRM programmes (e.g. AgriInvest and AgriStability) contribute in financial assistance? The evaluation of these questions leads toward the governments' determination of whether additional assistance through AgriRecovery is justified (AAFC, 2011). If it is deemed warranted, case-specific initiatives are developed. The funding of these programmes is shared between the federal government and the affected province(s)/territory(s) on the customary 60/40 basis. AgriRecovery is allotted a specific annual budget, currently CAD 125 million. Exceeding that budget requires federal cabinet approval.

The AgriInsurance programme is currently mainly used to insure crop-related production and asset losses caused by natural perils. The majority of premiums on plans under AgriInsurance are cost-shared 60/40 between government and producer, and the government portion is divided 60/40 between the federal and provincial governments. Notably, an extension of coverage to livestock-related production losses is ongoing.

The Advance Payments Programme allows for government-guaranteed cash advances of up to CAD 400 000 per production period to agricultural producers. As no specific use of the advance is mandated, this programme could be used by outbreak-affected livestock holders. Collateral, in the form of animals, is required to secure an advance.

To summarise the relations between the BRM programmes with the most relevance to livestock disease outbreaks, AgriInvest and AgriStability are designed to help counter general farm net income declines – AgriInvest for marginal declines of less than 15%, and AgriStability for more severe marginal impacts. Meanwhile, AgriRecovery is a framework allowing for case-by-case development of gap-filling initiatives aimed at promoting business continuity.

Table 7.3. Public compensation paid for animal losses and private indemnification payments

Year	Total public compensation paid for animal losses (in thousands CAD)	Diseases prompting livestock destructions or slaughters	Number of destructions and slaughters notified to OIE	Notable <i>ad hoc</i> programmes involving payments from government to livestock producers (in thousands CAD)	Gross (net) payments from private livestock and private dairy livestock insurance (in thousands CAD)
2010	1 322	Bovine anaplasmosis BSE Scrapie Equine infectious anaemia LPAI	176 (bovine); 1 (buffalo) 1 (bovine) 1 663 (sheep); 88 (goats) 23 (equine) 8 200 (birds)		52 (13)
2009	7 387	Equine encephalomyelitis Bovine anaplasmosis BSE Scrapie Equine infectious anaemia LPAI	3 (equine) 555 (bovine)* 12 (bovine) 453 (sheep) 78 (equine) 69 339 (birds)		50 (18)
2008	8 722	Bovine anaplasmosis Bovine tuberculosis BSE Scrapie	1 (bovine) 250 (bovine) 123 (bovine) 1 876 (sheep); 5 (goats)		103 (60)
2007	2 907	Bovine tuberculosis BSE Scrapie HPAI	515 (bovine) 112 (bovine) 14 (sheep); 24 (goats) 48 560 (birds)		110 (80)
2006	1 969	BSE Scrapie Equine infectious anaemia	101 (bovine) 219 (sheep) 53 (equine)	-181 (BSE recovery programme)	7 (-27)
2005	6 981	BSE Scrapie	320 (bovine) 1 217 (sheep)	-35 (BSE recovery programme)	7 (-26)
2004	70 651	HPAI** Bovine tuberculosis BSE Scrapie Equine encephalomyelitis	13 700 000 (birds) 9 (bovine) 10 (bovine) 441 (sheep) 1 (equine)	33 893 (BSE recovery programme)	41 (12)
2003	7 572	BSE Scrapie	2 700 (bovine) 5 360 (sheep)	429 858 (BSE recovery programme)***	36 (-3)
2002	7 010	Bovine tuberculosis Scrapie	158 (bovine) 3 331 (sheep)		30 (0)

* This figure includes an unknown number of wild animals.

** The total amount of compensation paid through the CFIA compensation scheme in 2004 as a result of avian influenza has been estimated at CAD 50-60 million (Antón *et al.*, 2011).

*** The BSE recovery programme was begun in mid-2003 to financially aid Canadian cattle producers affected by the closure of all major beef and cattle export markets following the detection of a cow in Alberta with BSE. The programme's budget was CAD 460 million, and this amount was cost-shared on a 60-40 basis between the federal government (CAD 276 million) and the participating provincial/territorial governments (CAD 184 million). The payments partially compensated for the difference between the price received for cattle sold for slaughter in Canada after the outbreak and a reference price based on market value in the United States (AAFC, 2011).

Source: Compiled by Civic Consulting based on data from AAFC (2011); Antón *et al.* (2011); OIE HandiSTATUS Interface (2011); OIE WAHID Interface (2011); Statistics Canada (2011b).

The CFIA-administered compensation scheme does not maintain a strict list of compensation-eligible diseases. As long as the animal in question has been ordered destroyed under the Health of Animals Act, compensation is payable – no matter the disease. So, if a

CFIA district veterinarian issues an order of destruction, those animals that are destroyed as a result of it, or die between issuance of the order and the actual destruction, are compensated. However, the diseases that typically prompt destruction orders are indeed those listed as “reportable” or “immediately notifiable” on the CFIA’s website. The “reportable” category, which requires livestock owners, as well as veterinarians and laboratories, to immediately notify the presence or suspected presence of a contaminated animal to a CFIA district veterinarian, comprises 32 livestock diseases, including: African swine fever, anthrax, bluetongue (certain types), BSE, bovine tuberculosis, equine infectious anaemia, FMD, HPAI, lumpy skin disease, Newcastle disease, *peste des petits ruminants*, Aujeszky’s disease, scrapie, and swine vesicular disease.¹⁰ Meanwhile, the “immediately notifiable” diseases (a lengthier list), e.g. other types of bluetongue, Hendra virus, and Nipah virus, are generally exotic to Canada and therefore not covered by established control/eradication programmes.¹¹ Notification of these diseases to the CFIA is only required of laboratories.

In the same way that the compensation scheme does not distinguish between “limited” and “catastrophic” outbreaks, neither does it differentiate between types of livestock diseases – e.g. between zoonoses and diseases that purely impact on animal production. As just discussed, the compensation procedures are effectively the same in all cases involving destruction orders issued by CFIA district veterinarians and, as detailed immediately below, the funds for the compensation payments come from the same source regardless the type of disease: the federal government always pays 100% of the compensation costs.

Financial structure

Compensation payments made under the CFIA scheme are funded directly through the federal budget. When the AAFC minister – via the CFIA’s procedures – orders compensation for a livestock holder, payment comes from the Consolidated Revenue Fund, which is the general account into which Canadian taxes and other revenue are deposited. This arrangement means there is no cost-sharing with the livestock industry, levy-based or otherwise. The compensation scheme is *ex post* and loss-dependent in the sense that it is only utilised to compensate owners of destroyed animals or products following an outbreak. Though the CFIA does administer other preventive activities, including product and facility inspections and surveillance of animal importation, during “peace-time”, the compensation scheme is a distinct and entirely *ex post* programme.

As suggested, private sector risk management tools such as insurance and mutual funds do not significantly impact on the functioning of the public compensation scheme. Evidence supporting this claim is displayed in Table 7.3 which allows comparison between annual public compensation payments for animal losses and payments from private livestock and private dairy livestock insurance.¹² With respect to the amounts of annual public compensation payments, 2004 stands out due to the nearly CAD 71 million paid in compensation for animal losses that year, a large portion of which compensated the nearly 14 million birds destroyed to control a highly pathogenic avian influenza outbreak. The other annual totals between 2002 and 2010 top out at around one tenth of the 2004 sum, with several years seeing cumulative public compensation payments in a lower range of CAD 1 million to CAD 3 million.

Outbreaks and practical experiences

In terms of the basic workings of the compensation scheme, interviewing suggested that from the CFIA’s perspective the programme generally functions well – compensation claims and subsequent payments are processed efficiently, and livestock owners understand and are reasonably satisfied with the scheme’s operation. During the interview, it was noted that, if there is an aspect of the compensation procedures which can lead to minor discord in interactions between livestock holders and CFIA employees, it is the dual nature of the

CFIA's work: on the one hand, the immediate duty of CFIA officials following a disease incident is to implement the measures necessary for outbreak control (e.g. destruction or slaughter of livestock); on the other hand, the agency must also evaluate and process associated compensation claims. Livestock holders, understandably concerned with the economic impact of control measures on their businesses, may prefer to discuss compensation initially, whereas CFIA personnel may in some cases see it as more of a secondary matter.

Narrowing the broader focus of Table 7.3 to annual compensation pay-outs during the past decade, Table 7.4 presents details of a few of the most significant Canadian livestock disease incidents and their impact, if any, on the CFIA-administered compensation scheme.

With respect to the manner in which the compensation scheme encourages good practices such as early notification of disease incidents and co-operation with subsequent control measures, two main factors incentivise early reporting. First, the Health of Animals Act requires immediate notification of reportable diseases and authorises the AAFC minister to withhold compensation where violations or offences under the Act have occurred. Second, there is no compensation for animals which die prior to the issuance of a destruction order. Additionally, general co-operation with disease control measures is arguably encouraged through the knowledge that the federal government will efficiently compensate the full market value of any animal(s) and/or product(s) ordered destroyed.

The emphasis that the scheme places on ensuring proper incentives for early reporting and co-operation with control efforts is clearly revealed in the Regulatory Impact Analysis Statement attached to the 2011 regulations which increased the maximum compensation amounts for poultry (Regulations Amending the Compensation for Destroyed Animals Regulations, SOR/2011-73). That text identifies the objective of the amending regulations as the establishment of maximum compensation rates in line with contemporary market realities “in order to continue promoting early reporting of diseases controlled under the Health of Animals Act, and encourage producer co-operation and participation during control/eradication efforts meant to prevent or reduce the spread of disease” (Ritz, 2011).

Looking at the dialogue that preceded the 2011 poultry compensation amendments reveals another aspect of recent experience with compensation scheme administration, namely successful co-operation between government and industry parties. During the run-up to the 2011 modifications, five national supply-managed associations¹³ collaborated with the CFIA via a Steering Committee on which they were represented. In addition, a technical working group supported the Steering Committee. These stakeholders worked together – the Steering Committee met three times across 2009 and 2010 – to examine potential revisions to the economic model utilised to calculate market value in the absence of a traditional market and, as a corollary to that work, the maximum compensation amounts themselves. Ultimately, and partly as a result of the industry's “extensive involvement in the process”, consensus emerged among the CFIA and industry representatives on the amending regulations (Ritz, 2011).

The involvement of industry representatives in scheme-related decision-making represents one method through which to promote stakeholder participation and thereby limit potentially adverse motivations. The Canadian compensation scheme also arguably guards against overcompensation through its reliance on market value-based evaluations of destroyed livestock and products which are capped at the maximum amounts listed in the Compensation for Destroyed Animals Regulations. Additionally, the potential financial penalisation of livestock holders who fully comply with movement restriction zones relative to neighbouring farmers whose property and animals lie within a destruction or slaughter zone might be partially resolved through the Business Risk Management programmes. While the CFIA compensation scheme would not cover such consequential losses, AgriInvest, AgriStability, and AgriRecovery could help to ensure compliance incentives by preventing large-scale (in severe cases) net income decreases among restriction-zone-bound farms. According to an

August 2011 interview, the CFIA's experience to date has shown that overwhelmingly stakeholders are co-operative and utilise the compensation scheme as intended. Nonetheless, there may be a theoretical risk of moral hazard arising from government assumption of such a large share of the relevant financial risks.

Table 7.4. Recent major outbreaks that prompted compensation payments

Disease	Time period	Scope of outbreak and compensation	Subsequent modifications to scheme (if any)
BSE	2003-2010	The initial May 2003 outbreak of BSE was in one sense small-scale because the disease was detected in only one cow. However, the trade implications of that detection, as well as the need to slaughter 2 700 animals during the control phase, rendered this a highly significant outbreak. Subsequently, at least one BSE case occurred per year from 2004 to 2010, and that period saw a total of almost 700 destructions/slaughters. In total, BSE-derived industry losses have been estimated at CAD 6.3 billion.	Though not directly affecting the CFIA-administered compensation scheme, the BSE outbreak did prompt the development of the 2003 to 2006 BSE recovery programme, which utilised its CAD 460 million budget to partially compensate cattle producers for lower post-outbreak product prices.
HPAI	2004, 2007	Large-scale: 53 outbreaks led to the destruction of 13.7 million birds in 2004 (over 400 commercial poultry farms were depopulated), and the outbreak in 2007 necessitated the destruction of 48 560 birds. The 2004 outbreak significantly impacted that year's public compensation payments for animal losses – the total exceeded CAD 70 million. For comparison, the second highest annual sum between 2002 and 2010 was below CAD 9 million.	According to a poultry industry source, the 2004 avian influenza outbreak led to discussions among the national poultry organisations on potential revision of the maximum compensation amounts for poultry (Chicken Farmer, 2011).
LPAI	2009, 2010	In 2009, two outbreaks of low pathogenic avian influenza led to 1 300 cases and nearly 70 000 bird destructions. A single outbreak in 2010 yielded 8 200 susceptible birds which were all destroyed. The number of birds destroyed in these incidents was seemingly insufficient to greatly alter the annual public compensation payment totals – the 2009 and 2010 sums were CAD 7.4 million and CAD 1.3 million, respectively. For comparison purposes, excluding the outlying case of 2004, the () average annual sum between 2002 and 2010 was CAD 5.5 million.	There was an "increased government focus to more adequately reflect the market value of the birds being destroyed ... after the more recent case of avian influenza in British Columbia in 2009" (Chicken Farmer, 2011). This timeline is supported by the "Regulatory Impact Analysis Statement" attached to the 2011 regulations that amended maximum poultry compensation. It states that "Subsequent to two incidents of avian influenza in British Columbia's Fraser Valley in the winter of 2009, it was deemed necessary to review the method of determining market value for poultry" (Ritz, 2011). One goal of this review was to develop models that would allow for rapid assessment of certain birds' market value in the absence of a normal market for them. In parallel, it led to the determination of a need to increase maximum poultry compensation amounts.

Source: Compiled by Civic Consulting based on data from Chicken Farmer (2011); OIE HandiSTATUS Interface (2011); OIE WAHID Interface (2011); Sparling (2010) *Background report on risk management in Canadian agriculture* (OECD Thematic Review on Risk Management in Agriculture. Unpublished internal report) in Antón *et al.* (2011); Ritz (2011); and Statistics Canada (2011b).

Finally, while the interviewed officials did not suggest that the CFIA scheme has contributed to decreasing the risk of livestock disease outbreaks, it has been noted elsewhere that by incentivising early reporting and co-operation with control measures, and thereby increasing the efficiency of disease responses, the scheme has the potential to reduce the human health and economic impact of large-scale outbreaks (Ritz, 2011).

7.3 Concluding remarks

The main quality of the Canadian animal health system is the importance of the consultation processes, which permit a consensus between federal government, provinces and territories, livestock associations, veterinarians associations and service providers on the animal health strategy. The quality of the initial training and the continuing education in this sector allows having relevant skills at each level of the system. These two factors create good conditions for confidence and transparency.

The main features of Canada's compensation scheme are highlighted in Table 7.5.

Table 7.5. Key features of Canada's compensation scheme

Name of scheme	Canadian Food Inspection Agency compensation
Legal basis	Payment of compensation is authorised by the Health of Animals Act 1990, which also authorises the AAFC minister to set out maximum compensation amounts. These have been established through the Compensation for Destroyed Animals Regulations (SOR/2000-233).
Institutional framework	
Scheme governance	The compensation scheme is administered by the Canadian Food Inspection Agency (CFIA) and is purely public in nature – its funding does not entail cost-sharing with the livestock industry. The CFIA reports to the Minister of Agriculture and Agri-Food Canada (AAFC), and is tasked with administration of several pieces of agricultural legislation and, more generally, with ensuring food chain and livestock population safety. CFIA district veterinarians can issue destruction orders specifying the animals/products to be destroyed once they determine a disease's presence at a livestock holding. Either a compensation evaluator or a team of evaluators is then charged with calculating the market value of the destroyed things, and a compensation evaluation form is forwarded to the livestock holder who has the right to appeal its figures.
Main stakeholders	Minister of Agriculture and Agri-Food Canada CFIA; CFIA district veterinarians Livestock holders (and national supply-managed industry associations)
Is private insurance coverage available?	The availability of private insurance for risks linked to epidemic livestock diseases is minimal. Recently, the Canadian government has made efforts to collaborate with the private sector on insurance product development, but farmers still overwhelmingly rely on public risk management programmes, especially in the field of catastrophic disease risks.
Compensation	
Overview of the scope of compensation	The CFIA scheme compensates livestock holders for three categories of losses: animals ordered destroyed; destroyed items such as contaminated feed and animal products; and the disposal costs of destroyed animals.
Are consequential losses covered?	The CFIA-administered scheme only indemnifies direct losses imposed by disease control measures; it does not compensate for consequential or business interruption losses.

Table 7.5. Key features of Canada's compensation scheme (*continued*)

Stakeholders' eligibility for compensation	Commercial livestock holders	With respect to the primary category of compensated losses, namely animal losses, owners are compensated when: 1) The animal is destroyed under the Health of Animals Act or dies after its destruction has been ordered; or 2) The animal dies or must be destroyed due to injury caused by an inspector/officer during testing, treatment, or identification; or 3) The animal is reserved by authorities for experimentation.
	Smallholders and non-commercial/hobby farmers	Are compensated in the same manner as larger commercial holders, because compensation is payable for any animal – from production livestock to zoo animals and family pets – ordered destroyed for disease control purposes.
Rules for valuation	Compensation is based on the assessed market value (the value the animal would have had at the time of its evaluation by the Minister if it had not been required to be destroyed) of the animals destroyed, up to the maximum amounts set in the Compensation for Destroyed Animals Regulations, minus any value received through carcass salvage. The compensation “amounts are intended to reflect the reasonable depreciated value that an owner could expect to receive for the animal or thing on the current Canadian market” (CFIA, 2011d) and thus generally fall below the established maximum amounts. Market value assessments can be performed in two ways: 1) For commonly traded animals like cows and sheep, they are based on replacement cost on the relevant market – an animal's age, genetics, and production factors, etc., are analysed; 2) When there is no real market for an animal (e.g. hatching-egg birds) the replacement value is calculated with an economic formula that accounts for the production or life cycle phase achieved at the time of destruction and the associated “grow-out” costs.	
Conditionality	Though the scheme does not specify an hour- or day-based time limit for reporting, livestock owners or caretakers must notify reportable disease incidents to veterinary inspectors “immediately after”. The AAFC minister can partially or fully withhold compensation for violations or offences of the Health of Animals Act, so late reporting or any other act of gross negligence could result in loss of compensation.	
Time frame for payment	Six to ten weeks (assuming the livestock holder does not appeal the initial compensation evaluation).	
Diseases covered	The CFIA-administered compensation scheme does not maintain a strict list of compensation-eligible diseases. As long as the animal in question has been ordered destroyed under the Health of Animals Act compensation is payable – no matter the disease. Yet, the diseases that typically prompt destruction orders are indeed those listed as “reportable” or “immediately notifiable” on the CFIA's website. The “reportable” category, which requires livestock owners, as well as veterinarians and laboratories, to immediately notify the presence or suspected presence of a contaminated animal to a CFIA district veterinarian, comprises 32 livestock diseases. Meanwhile, the “immediately notifiable” diseases (a lengthier list), are generally exotic to Canada and therefore not covered by established control/eradication programmes. Notification of these diseases is only required of laboratories.	
Differentiated treatment of diseases	The compensation scheme does not differentiate between types of livestock diseases – e.g. between zoonoses and diseases that purely impact animal production. The compensation procedures are effectively the same in all cases involving destruction orders issued by CFIA district veterinarians, and the compensation funds always come from the same federal source regardless the disease.	

Table 7.5. Key features of Canada's compensation scheme (continued)

Financial structure	
Funding sources and mechanisms	Compensation payments made under the CFIA scheme are funded directly through the federal budget, with payment coming from the Consolidated Revenue Fund, which is the general account into which Canadian taxes and other revenue are deposited.
Cost-sharing	The public contribution is <i>ex post</i> and loss-dependent in the sense that it is utilised to compensate owners of destroyed animals or products following an outbreak. Although the CFIA does administer other preventive activities, including product and facility inspections and surveillance of animal importation, during “peace-time,” the compensation scheme is a distinct, <i>ex post</i> programme.
Practical experience	
Incentives provided (for prevention/biosecurity practices and early notification)	From the CFIA's perspective, the programme generally functions well – compensation claims and subsequent payments are processed efficiently, and livestock owners understand and are reasonably satisfied with the scheme's operation. If there is a potentially complicating aspect of the compensation procedures, it derives from the dual role played by CFIA officials who must both implement control measures and evaluate/process compensation. The compensation scheme encourages early notification of disease incidents through: 1) the Health of Animals Act's requirement of immediate notification of reportable diseases and the authority it grants the AAFC minister to withhold compensation where violations or offences under the Act have occurred; and 2) the non-compensation of animals which die prior to the issuance of a destruction order. Additionally, general co-operation with disease control measures is arguably strongly encouraged through the knowledge that the federal government will efficiently compensate the full market value of any animal(s) and/or product(s) ordered destroyed.
Efforts to mitigate potentially adverse incentives	The scheme arguably guards against overcompensation through its reliance on capped (through the schedule of maximum animal values) market value-based assessments of destroyed livestock. The CFIA's experience to-date has shown that overwhelmingly stakeholders are cooperative and make use of the compensation scheme as intended. Nonetheless, there may be a theoretical risk of moral hazard issues arising from government assumption of such a substantial share of the financial risks that arise from epidemic livestock diseases.

* This table refers only to the CFIA-administered compensation scheme.

Notes

1. Section 7.1 of this chapter is mainly based on the report “Management of risks from epidemic livestock diseases: Review and comparison of Prevention and Control systems in selected countries”, prepared for the OECD by a team from Phylum Consulting (France). Sections 7.2 and 7.3 are mainly based on the report “Management of risks from epidemic livestock diseases: Overview of key issues and comparison of compensation and cost-sharing systems in selected countries”, prepared for the OECD by a team from Civic Consulting (Germany).
2. Section 51 also permits compensation for animal disposal costs. Section 52 specifies the availability of compensation for destroyed products (Health of Animals Act, S.C. 1990, c. 21). The authority to actually order animal and product destruction is also derived from the Health of Animals Act (Section 48).
3. The current Compensation for Destroyed Animals Regulations originated in 2000 (SOR/2000-233). The maximum compensation amounts available for schedule-listed animals were updated in July 2007 (SOR/2007-169) and amended later that same year (SOR/2007-269). In March 2011, publication of the Regulations Amending the Compensation for Destroyed Animals Regulations (SOR/2011-73) increased maximum poultry values (Ritz, 2011).

4. See, for example, Ritz (2011) on the poultry industry's participation in the recent development of new market value regulations for their sector.
5. So, for example, "an important part of the [poultry] model is that costs are reflected when they are incurred during the grow-out cycle, so that the appropriate compensation amount would be paid based on the date of the CFIA order" (*Chicken Farmer*, 2011, p. 2).
6. Compensation claimants can also appeal if they feel that compensation has unreasonably not been awarded (Health of Animals Act, S.C. 1990, c.21). The time limit is three months after receipt of notification of the minister's decision.
7. Indeed, the Compensation for Destroyed Animals Regulations (SOR/2000-233) lists maximum compensation values for over 200 animals, only about 50 of which are categorised as "farm" animals.
8. An interview with Canadian officials from the CFIA and AAFC confirmed that gross negligence relating to reporting of a disease outbreak could give the AAFC minister flexibility with respect to not issuing compensation under the Health of Animals Act.
9. Animals that are sick at the time of reporting are compensated if they are still alive when their destruction is ordered.
10. The listing of these "reportable" diseases is made official through the Reportable Diseases Regulations (SOR/91-2) under the Health of Animals Act.
11. The "immediately notifiable" diseases are officially listed in the Health of Animals Regulations (C.R.C., c. 296).
12. Notably, the private payouts data in Table 7.4 may include a wide range of products, i.e. it is not limited to private insurance indemnification of risks from livestock diseases.
13. The five associations are Egg Farmers of Canada, Turkey Farmers of Canada, Chicken Farmers of Canada, Canadian Hatching Egg Producers, and Canadian Poultry and Egg Processors' Council.

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Chapter 8.

France

This chapter describes important features of the animal disease management system in France. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The concluding remarks summarise the main characteristics and challenges.

France, a founding member of the European Union (EU), has an area of 643 801 km² and about 65 312 000 people, with a high GDP per capita at USD 3 100 (PPP according to the World Bank). In the metropolitan area, the climate is temperate with cool winters and mild summers. Much of the landscape consists of plains and hills favourable for agriculture and livestock. These conditions explain the long tradition and the development of agriculture and livestock in France.

France is a republic with the executive branch led by the President of the Republic (chief of state) and the government. The legislative branch is based on a bicameral parliament (National Assembly and Senate). The administrative system is traditionally centralised, from the head of the Ministries to the different administrative divisions (regions, departments...). The competencies of local authorities (*Conseils Régionaux* at regional level, *Conseils Généraux* at department level, ...) are confined to social and economic development aspects of their territory within limits defined at national level. Veterinary Services are mainly organised following this centralised system, from the central level led by the Ministry of Agriculture to the level of departments. Taking into account that France has the biggest agriculture of the European Union, it has an important influence on the European Union's Common Agricultural Policy, with its regulations concerning agriculture, animal health and food safety.

Agriculture and the agri-food industry made up 3.5% of French GDP in 2008. Livestock production represents 35% of agricultural GDP. France has the highest population of cattle in Europe, with more than 19 million heads, including 4.3 million suckled cows and 3.7 million dairy cows. It is also the largest producer of poultry in the European Union, and the third largest country in terms of the number of pigs. Intensive animal production (poultry, pork) is mainly concentrated in the western regions of France (Bretagne, Pays-de-Loire). Dairy production is also mainly concentrated in the West of France and in mountain areas for specific dairy products. Suckled cows are mainly concentrated in the Massif Central and in Bourgogne.

A large part of French animal production is exported, mostly on the open EU market: 22% of beef production, 29% of pork production, and 15% of poultry production. Imports from neighbouring European countries are also important. A significant part of animal products from France is also exported on the global market, e.g. 18% of poultry production, and 6% of pork production.

Taking into account the importance of animal production and trade of animal products or live animals with neighbouring countries, animal health is a big issue in agricultural policy in France. As described in OIE WAHID Data Base, the sanitary situation in France is quite good. The main animal diseases have been eradicated or are under control. However, some diseases nearly eradicated are still present or re-emerging in one or two zones of the territory (bovine brucellosis, bovine tuberculosis...).

During the last ten years, France, as other main European countries, has been faced with several outbreaks of emerging diseases. These have emphasised the importance of surveillance to detect suspected cases as soon as possible and the importance of biosecurity measures at borders of the European Union:

- Bovine spongiform encephalopathy (BSE) crises in 1996 and 2000
- FMD in 2001 imported from the United Kingdom
- Several cases of rabies imported with young stray dogs picked up by tourists in foreign countries;
- HPAI (high pathogenic avian influenza); and

- Blue tongue coming from the Netherlands and Belgium in the North, and from Italy and Spain in the South.

8.1 Prevention and control system

Historically, the organisation of the Veterinary Services (VS) in France is based on three partners.

- A centralised administration with its headquarters in the Ministry of Agriculture (*Direction Générale de l’Alimentation*: DGAL) with services in each department and in region.
- A strong network of organisations representing the farmers (*Groupelements de Défense Sanitaire*: GDSs), supporting the practical organisation of prophylaxis programmes (communication campaign, practical support for implementing control measures, and contributing to the financing of animal health campaigns through membership fees collected from farmers).
- A network of private practitioners with a mandate from the official VS and paid to carry out some control measures, such as vaccinations, sampling for screening programmes, etc.

Around 600 public veterinarians and 2000 paraprofessionals are employed by the Ministry of Agriculture and are involved in animal health in the DGAL and its decentralised services. Around 14 000 private veterinarians have activities in the animal health area (practising or working for cooperatives or farmer organisations such as GDSs). Private practitioners with a sanitary mandate are involved in the practical implementation of the active surveillance or vaccination campaigns through delegated activities by the official VS and are paid by the Ministry of Agriculture for these activities. It is a way to maintain a high density of veterinarians in the field providing services to farmers. This network has shown its efficiency since the beginning of public animal health programmes. During the last years, some limits have been identified and some changes are on-going.

The animal health system is currently in a transitional period. On the one hand, a reform of the state administration has brought together several decentralised services at regional and department level joining local VSs with other administrative services (e.g. fraud, environment). On the other hand, the French Ministry of Agriculture organised in 2010 a forum on animal health and plant protection (*Etats Généraux du Sanitaire*: EGS) with all stakeholders (Box 8.1). An action plan has been defined and the main recommendations will be progressively implemented.

This chapter presents the current situation with the main changes that should occur with the recommendations from the EGS.

Box 8.1. “Etats Généraux du Sanitaire”: A large consultation forum with all stakeholders

In 2010, after several sanitary crises in animal health (blue tongue, HPAI...) and in pest control (*Diabrotica virgifera*) for corn, the Ministry decided to organise a large consultation through a forum with the different stakeholders: farmers with GDS and union farmers, food industry, co-operatives, associations of private veterinarians, governmental agencies, Ministry of Agriculture, ...

Over six months, three groups met to define recommendations. A new sanitary strategy was defined through an action plan with 40 recommendations. Among these recommendations, we highlight:

- The creation of an epidemio-surveillance platform with regional and national information to share all relevant data and to identify emerging risks;
 - The creation of a sanitary federation at regional level with all stakeholder associations: GDS, cooperatives, veterinarian associations, industry and co-operative associations;
 - The creation of professional fund for mutualising sanitary costs with partial reimbursement by the State in order to increase the responsibilities of the stakeholders.
- The strengthening of emergency responses in case of outbreaks.

Taking into account the diversity of the interests of the different kinds of stakeholders, the result may be considered a success, and offers a framework to improve the animal health system.

Risk assessment

When the DGAL needs scientific expertise concerning animal health, it sends a request for a scientific risk assessment to the ANSES (*Agence Nationale de Sécurité Sanitaire*). The ANSES is the agency in charge of risk assessment on food, animal health and plant protection, environment and security working (see Box 8.2). It is the result of fusing several risk assessment agencies, especially the AFSSA (*Agence Française de Sécurité Sanitaire des Aliments*). There is a separation between the risk manager (DGAL) and the risk assessor (ANSES). Depending on the subject of the request, the ANSES creates working groups with experts from different origins: their own reference laboratories, universities, veterinary schools and research centres. They provide scientific opinion and assessment on a specific risk for the country (e.g. animal health risk, food safety risk) or on the efficiency of proposed control measures (AFSSA, 2010; ANSES, 2011). During the last ten years, the importance of this independent agency has increased, and the DGAL is sending more and more requests.

Box 8.2. ANSES, an independent food safety agency created in 1999

The ANSES (formerly AFSSA) was created on 1 January 1999 after the BSE crisis, to form an independent agency for risk assessment. This agency was under the supervision of the Ministry of Health, the Ministry of Finance and the Ministry of Agriculture. The main reference laboratories working on animal health and food safety were transferred to this new agency when it was created.

The main objective was to develop the capacities of independent and scientific risk assessment. Mainly created for food safety topics, the AFSSA has delivered recommendations on animal health policy, and recommendations to improve communications to the public of the results of the scientific evaluation. For instance, the DGAL sent 39 requests to AFSSA in 2009 on animal health and animal welfare, and 46 in 2010.

In the area of animal health, the current agency has three missions:

- Risk assessments
- Research activities through 12 reference laboratories
- Management of veterinary medicines and biological products (authorisation, import control, production and delivery).

In the EU context, after the creation of food agencies in charge of risk assessment in different countries, the European Commission decided to create the European Food Safety Agency (EFSA) to develop EU risk assessment with better EU co-ordination through sharing expertise. In most cases, the national agencies cooperate with EFSA by participating in European expert committees or sharing their expertise. In other cases, under the subsidiarity principle, the national competent authority can send a national specific question to its food safety agency, concerning a risk limited to the national territory or the definition of specific national rules, complementary to the EU regulations. In a few cases, the national agency can give a different opinion than the European agency. The consequence can be a different decision in one country than in the rest of the European Union. Procedures to solve the conflict between two countries or between one country and the others are used to find a compromise.

After the BSE crisis, several databases have been developed to offer relevant tools for decision-making and management in the animal health area (DGAL, 2011a).

- **BDNI** (*Base de Données Nationale d'Identification*): a national database for animal identification and traceability of movements. This database is supplied with the data recorded in each department thanks to the declarations of the farmers, and with data coming from other specialised professional databases: BDPORC which traces all movements of pigs, NORMABEV which collect all regulatory information from slaughterhouses, and OVIN INFO which is the national database of identification and traceability of movements of small ruminants.
- **SIGAL** is the database to collect sanitary information, and especially to manage all the animal health programmes (e.g. active surveillance of brucellosis, tuberculosis, monitoring of the vaccination campaign against blue tongue). The data from the database are used for certificating the sanitary status of live animals from farms. A complementary database exists to manage the surveillance on the ESST.

These databases are also available for professional organisations to develop their own analyses: e.g. improve their knowledge of the market, identify the flows of the different categories of animals, collect data needed to define collective animal health programmes. One of the conclusions of the EGS (see below) is to increase the sharing of sanitary information from different sources with the creation of platforms at regional level gathering sanitary information coming from industries, GDS, laboratories, official VS, ... (*Ministère de l'Agriculture, de l'Alimentation de la Pêche*, 2010). However, taking into account the sensitivity of this question, this will be a long process.

Decision-making

The legislation (*Code Rural*) clearly defines the Ministry of Agriculture (DGAL) as the competent authority in charge of defining the public animal health programmes in the country: the choice of the diseases concerned by control measures, the definition of control and eradication measures, the definition of compensation rules and incentives. These decisions can concern national programmes for some diseases or a programme mainly focused on some regions where the disease has a strong impact on livestock. However, in some regions or departments, some farmer associations specialised in disease control (GDS) have defined programmes to control other diseases without a national programme, with the financial support of local authorities such as the *Conseils Généraux*.

At the local level (*Département*), there is long experience of consultation with the GDSs representing all farmers, decentralised services of the official VS, private veterinarians and local veterinary laboratories belonging to the *Conseils Généraux* (local authorities). In some *départements*, the results of this partnership are the development of local animal health

programmes for some diseases not covered by national policy (e.g. BVD, paratuberculosis), with better cost-sharing.

At the national level, consultations exist with the different animal sectors. The GDSs are represented by their national federation (GDS France). Formally, there is a consultative committee (*conseil d'orientation de la politique sanitaire agricole*) for all sanitary issues (plant protection or animal health. Part of this new committee was the former national consultative committee of animal health and animal protection with the participation of the Ministry of Agriculture and the main representative associations involved in animal health policy (e.g. GDS France, sectoral industry associations). This committee is in charge of the final consultation before the political decision. A large part of the national consultation depends on the quality of the relationship between the office in charge of the preparation of the decision at the DGAL and the representatives of the different actors (e.g. GDS France, animal product sectors). After the large consultation organised in 2010 with the EGS (Box 8.1), it will be interesting to verify whether this important forum has improved the consultation process.

As a member state of the European Union, the DGAL actively participates in the work of the European Commission (DG Sanco). A corpus of common EU regulations on the main animal health diseases defines the rules for free trade within the European Union, and the main policy to be applied to control these diseases. This legislation can be adapted, when needed, if the epidemiologic situation changes, as has been done, for example, for blue tongue after its introduction into Europe. However, this legislation will soon be replaced by the new EU animal health framework, which will enable an early response to emerging threats and provide the legal basis for modifying existing or adopting new rules to address a changing epidemiological situation.

The EU Standing Committee on the Food Chain and Animal Health (SCFCAH), with representatives of each member state, has regular meetings (one or more per month) to share sanitary information, and co-ordinate policies. It is the main committee to endorse the legislative drafts: around 80 texts are voted on each year. Consultation with stakeholders at EU level is also regularly organised in Brussels within the framework of the Animal Health Advisory Committee, which meets at least three to four times per year. More specific and targeted consultations are also organised with participation in different steering and/or working groups.

In 2007, with many consultations, the European Union defined a new strategy for animal health with the objective of preparing a new regulatory framework (Commission Européenne, 2007). The main objectives of this new strategy are: prioritisation of the diseases covered by public policies, modernisation of the regulatory framework with a single regulation, better cost-sharing with producers, strengthening prevention via the promotion of biosecurity measures (in farms, at borders) and strengthening of emergency response. The new legislation will have to define common rules while allowing specific measures adapted for the specific epidemiologic situations in the different parts of the European Union, and avoiding unjustified sanitary barriers.

Decision-making by the DGAL on French animal health policy is based on scientific risk evaluation provided by the ANSES. Procedures are defined for an emergency response in case of an outbreak. One of the recommendations of the EGS was to develop the cost-benefit and socio-economic analysis. Since 2009, DGAL has begun to develop tools to strengthen its capacity to carry out impact analysis. Some in-depth cost-benefit studies have been done on some sanitary issues by external agencies (e.g. research centres). A guide is being prepared to facilitate simple and rapid cost-benefit analysis before taking any decision.

An immediate result of the EGS is the categorisation of diseases (sanitary hazards):

- Category 1 for all diseases with an impact on public health and major impact on livestock production and trade, which requires public policy;
- Category 2 for diseases not in Category 1 for which it could be interesting to define control or eradication measures because of their impact on livestock production;
- Category 3 for other diseases for which no public policy is required and any programmes will depend on private initiative.

However, diseases are not yet classified into these three categories, which will probably indicate cost-sharing. Category 1 will still benefit from public funding. Category 2 will probably have limited public support, but need regulation for certification or to regulate the trade conditions. Diseases of Category 3 will only concern private initiatives. This categorisation has no direct link with the OIE's disease list. The European Commission is also thinking about a categorisation framework, but this is not yet defined. Thus, there is as yet no link between the French categorisation and the Commission's project.

One of the consequences of the EGS could be the creation of a professional organisation (or the transformation of an existing one) with the participation of the different kinds of stakeholders (e.g. industry, co-operatives, GDS, veterinarians) to carry or order a technical study to provide information on the practical feasibility and the cost of different sanitary strategies to control a disease. This organisation could be in charge of cost-benefit and socio-economic analyses.

Implementation of animal health programmes

The programmes against disease are mainly national, i.e. active surveillance (e.g. Classical Swine Fever, HPAI); surveillance and eradication (e.g. bovine tuberculosis, brucellosis, Aujeszky's disease, Newcastle disease); and surveillance and control (e.g. blue tongue). Some programmes are developed locally, with official VS support, for disease eradication or control: contagious agalactiae in Pyrénées-Atlantique, SDRP (*Syndrome Dygenesique et Respiratoire du Porc*, also known as PRRS, or Porcine Reproductive and Respiratory Syndrome) in some regions. For some diseases, some control measures are collectively defined and implemented only by private initiatives (e.g. GDS in some *Départements*, some industrial supply chains) without support from the State VS. Sometimes these can be supported by local authorities.

The implementation of animal health programmes in the field is based on a network composed of four partners:

- The decentralised VS, which co-ordinate the animal health programmes. Over recent years, they have delegated more and more activities to the GDSs or to practitioners.
- The farmer organisations (GDS) which organise, in practice, the animal health programmes (communication to farmers, management of records of vaccinations or of sample and testing results). These kinds of organisations play an important role in the animal health system, and are delegated more and more activities from the official VS, such as sanitary certification of farms or animals;
- Private practitioners with a "sanitary mandate" for doing samples or vaccinations, for delegated activities. With the end of the official prophylactic programmes, the Ministry of Agriculture has decided to maintain an annual inquiry visit paid by the Ministry in order to maintain minimum epidemiologic surveillance. To facilitate this work, DGAL has developed software (BDIVet) which gives to each practitioner with a sanitary mandate access to all relevant data concerning the herds under his or her mandate.

- The veterinary laboratories (around 80) which carry out the tests for the screening of contaminated animals.
- The situation is different from one *Département* to another, depending on the capacities of each partner. However, it represents a very dense network with around one veterinarian per 2000 Veterinary Livestock Units (VLUs).
- With an open market in the European Union, French border posts are focused on the trade with third countries. The posts are directly under the responsibility of the central level (DGAL) in a new service (*Service d'inspection vétérinaire et phytosanitaire aux frontières*: SIVEP), for the better implementation of the recommended control measures by the central level, and for the better communication with the European Commission. The Commission has developed an information system (TRACES) to monitor all movements of imported live animals and animal products in a single database. This allows the importers to declare the arrival of their consignments and the results of the inspection by the border posts.
- Biosecurity between farms is the responsibility of the farmers. Some specific measures are defined for some animal breeders to avoid the spread of the main diseases (animals for artificial insemination centres, farms specialised in breeding animal production, etc.). As in many other countries, farmers' associations, co-operatives and food industries have developed farming practices to promote, for example, good biosecurity measures at farm level through guides, extension services, and incentives on the price of the animal products.

Box 8.3. “Groupement de Défense Sanitaire”: A key interprofessional organisation

The GDS is a specific association created in each *Département*. The success of these associations is based on the involvement of all farmers (large farms as smallholders). Usually, more than 95% of farmers are members of these associations. They have developed a network with regular meetings in each county (*canton*) to inform the farmers on the animal health programmes and to collect their needs.

A key factor of the GDS success is its capacity to discuss with all partners: official veterinarians, co-operatives and food industry, private practitioners, etc. to define a common sanitary policy for its *Département*. Its representativeness of the farmers and its independence from the different economic interests are important. In some, the local veterinary association is represented on the board.

The first role of the GDS is to express the needs of the farmers and to organise consultation between the different partners, under the supervision of the official VS. The other missions are:

- Support of the organisation of the prophylaxis and vaccination campaigns
- Management of the sanitary information from these campaigns
- Certification of the status of farms or live animals under the mandate and supervision of the official VS; for this, they are accredited as an OVS (*Organisme à vocation sanitaire*: organism with sanitary vocation).

Some of these associations are able to manage private collective sanitary programmes (control of mastitis in dairy cows, programmes against BVD or paratuberculosis, ...).

They collect fees from the farmers to pay for the different animal health activities. The situations are different from one *Département* to another. In the most developed systems, the GDS collects the fees from farmers, and the subsidies from local authorities, and pays for all services (sampling by veterinarians, testing by the laboratory, ...). The GDSs organise the cost-sharing between the public funding and the fees collected from the farmers. Some have created a mutual fund based on farmers' contributions to be able to pay for control measures in case of a sanitary crisis on farms. This is a way to share the economic losses, to facilitate notification of suspected cases, and to develop sanitary solidarity between farmers. This model is working well for ruminants.

Following the EGS, it has been recommended to strengthen their role at regional level with regional organisation joining the GDS from different *Départements* and other relevant professional organisations (veterinary associations, co-operatives associations, food industries associations ...). The main issue is to cover all the species in a same private institution on a more relevant territory.

Since 2007, the reform of Common Agricultural Policy has introduced subsidy cross-compliance: farmers have to follow regulatory requirements such as animal identification and movement traceability, the reporting of any suspected cases in the farm and the use of veterinary medicines, and animal welfare requirements. Regular audits carried by the Ministry of Agriculture verify that farmers are in compliance with these requirements, with the risk of loss of subsidies in case of non-compliance. This is a powerful lever to promote good farming practices by producers who receive subsidies.

In the future, in the new EU legal framework for animal health will offer the possibility of developing guidelines for biosecurity. Currently, there are several different situations as regards cost-sharing:

- The government pays compensation if control measures of national sanitary programmes require the culling or destruction of animals (BSE, tuberculosis, ...). The compensation normally covers the main losses of the farmer including disinfection, reimbursement for depopulation, and business interruption due to sanitary measures linked with contagious disease. However, economic losses due to the eventual impact of the contagious disease on the market prices are not taken into account.
- During the first years, the vaccination campaigns against blue tongue were free of charge for the farmers. Private veterinarians were paid by the Ministry for these delegated activities. Now, vaccination is voluntary and paid by the farmers.
- Most of the local authorities (*Conseils généraux*) provide financial support to animal health programmes (brucellosis, tuberculosis...) through their laboratory providing low-cost or free tests, or through subsidies to the GDSs, thus reducing the fees for the farmers indirectly. Their contribution depends on their political interest in livestock activities and on their financing capacities.

Beyond this distribution of costs, it is very difficult to assess cost-sharing overall, because the situations are very different from one *Département* to another, and from one disease to another. The budget for animal health activities was around EUR 146 million in 2010, to which must be added the contributions of local authorities (probably around EU 30 million) and of the farmers. Finally, a large part of the control costs are paid by farmers, even though it is difficult to assess precisely their contribution.

Outbreak management

The management of the disease outbreaks is undertaken by the official VS, with the support of the organised veterinary network:

- The identification of suspected cases is done by veterinarians with a “sanitary mandate” (after information from the farmer or during a visit to the herd);
- The suspected case is notified by the veterinarian to the decentralised VS, and then the VS organises the confirmation of the case (sampling, laboratory testing) and begins the epidemiologic inquiry, with the support of the private veterinarian and the GDS.
- The headquarters (DGAL) is informed, and defines the relevant control measures to limit the spread of the disease. If needed, new regulations are prepared for the implementation of the control measures and for the payment of these measures, including compensation if needed.

In order to support this process in case of an emergency situation, the DGAL created the MUS (*Mission des Urgences Sanitaires*) in 2008, as a specific unit to co-ordinate the response to a sanitary alert (for an example, see Box 8.4). Mainly designed for food safety alerts, the

MUS has defined procedures for the notification of animal diseases, and instructions for the management of some specific notifiable disease (anthrax, Q fever) (DGAL, 2011a). It also prepares the emergency response plans for the main contagious diseases with a strong chain of command and co-ordination of the different actors. For instance, 84 suspicions of contagious diseases were notified to the DGAL in 2010.

Supervision of the animal health system is organised by the Ministry of Agriculture through audits and supervision missions carried out by the CGAAER (*Conseil Général de l'Alimentation, de l'Agriculture et des Espaces Ruraux*) (CGAAER, 2011). For instance, in 2009-2010:

- Audits were carried out on the management of animal by-products, and on animal welfare in slaughterhouses; and
- Studies were carried out on several topics such as “private practitioners and veterinary practicing in rural areas”, “evaluation and perspectives of the annual visit in cattle farms”...

These reports are mainly internal, although some of them are shared with relevant stakeholders.

The DGAL is regularly audited by the FVO (Food Veterinary Office), the EU agency in charge of verifying the implementation of EU Regulations and Directives in each member state. In 2010, the DGAL with its decentralised services was accredited as an inspection body following the ISO 17020 standards by the French accreditation body COFRAC (DGAL, 2011b). The COFRAC audit concerns mainly the inspection missions of the DGAL. However, this accreditation demonstrates the high level of quality management.

Box 8.4. The blue tongue outbreak in 2006-2008: Some lessons

In 2006, a blue tongue outbreak began in Netherlands, and progressively spread to France. We can identify three main steps in the control of the disease:

- Before the first case in France, a surveillance plan was implemented in farms near the border to detect any cases.
- After the first cases in 2006, the DGAL decided on some control measures with zoning to control the spread of the disease by limiting the movement of the animals. These measures had a huge economic impact on the trade of live animals and on slaughterhouses in the area concerned. In 2007, when the disease had spread to large areas breeding live cattle for exports, a protocol was negotiated with the Italian VS and validated by the European Commission to allow the export of live cattle after a negative virologic test.
- At the end of 2007, with the wide spread of the disease, the strategy was changed to vaccination, with the constraint to maintain exports of live young bulls after their vaccination, and the need to protect all the herds on which the symptoms are more significant, creating economic losses.

This outbreak highlighted some key issues:

- The capacity of applied research to assess quickly the new situation for a disease whose epidemiologic behaviour is different from the endemic areas.
- The importance of farmer and practitioner training and capacity to suspect a disease without pathognomonic symptoms.
- Cost-benefit analysis capacities to combine scientific assessment and economic analysis to measure the consequences of the disease on the different actors of the food chain and to adapt the control measures following the evolution of the disease epidemiology.
- The importance of interprofessional co-ordination of the stakeholders (farmers, practitioners, traders of live animals, meat industry, ...), taking into account the economic interests of each, and facilitating consensus in case of a new outbreak.

These lessons inspired some EGS recommendations: the creation of sanitary associations with all stakeholders (GDS, co-operatives, animal product industry) at the regional level, and the strengthening of the emergency response in case of an outbreak.

Source: DG Sanco-OAV, 2008; Ollivier B., 2009.

8.2 Concluding remarks

The animal health system in France is still based on a centralised official Veterinary Service and, at the level of the *Département*, on a traditional tripod with the GDSs (farmers' associations), the network of private practitioners, and the decentralised Veterinary Services. However, this system is in a transitional period, due to the reform of the administrative organisation in France and the recommendations of a large consultation forum (*Etats Généraux du Sanitaire*, EGS). As an EU member state, France will have to adapt its policy to the new European legislation on animal health under preparation.

Normally, the principles of this evolution should be:

- Stronger co-ordination of the field operation at the regional level with a platform to share all sanitary information;
- Better integration of animal product industry in the animal health policy;
- Strengthening of the technical capacities of the stakeholder associations in charge of animal health policy in designing and evaluating animal health programmes.

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Chapter 9.

Germany

This chapter describes important features of the animal disease management system in Germany. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The second section analyses compensation schemes and the system of incentives, including institutions, compensation practices, financial structures, and incentives for notification and prevention. The concluding table summarises the main characteristics and challenges.

Germany has a sizeable livestock industry, ranking as the largest pork producer and second-largest beef producer in Europe, behind France. It has 27 million pigs (about one sixth of the EU total), 12.7 million head of cattle (3.8 million slaughtered per year), and 72 million hens. Germany has approximately 180 000 cattle operations (about half of which are focused on milk cows), 65 000 pig operations and 75 000 chicken operations (German Ministry of Food, Agriculture and Consumer Protection, 2011b). About 60% of the pigs and cattle are kept in herds of more than 1 000 and 100 animals, respectively (German Meat GmbH). Germany's leading beef-producing states are Bavaria, Baden-Wuerttemberg, Lower Saxony, and Schleswig-Holstein, which collectively account for about three-fourths of Germany's cattle. About half of the country's pigs are raised in northwest Germany near the Dutch border (Franz and Theuvsen, 2007).

Several cases of infectious animal diseases in Germany have been reported to the OIE in recent years. In 2006, a case of highly pathogenic avian influenza (H5N1) was detected at a farm in the state of Saxony (*Sachsen*). A total of 800 laying hens, geese, and turkeys died and 13 500 were destroyed (OIE, 2006). In 2008, a case of H5N1 was detected at another farm in Saxony. A total of 1 434 birds (laying hens, geese, ducks, and turkeys) were destroyed. In 2009, Germany declared its domestic poultry industry to be free of the virus (OIE, 2009). In 2010, a case of enzootic bovine leucosis was detected at a farm in Bavaria (*Bayern*). One hundred cattle were susceptible to the virus and one was slaughtered (OIE, 2010).

In Germany, the main institutional system that compensates livestock holders for losses caused by epidemic diseases are the animal disease funds called *Tierseuchenkassen*. These publicly administered funds are supported by mandatory levies paid by livestock operators, as well as by funding from state governments and co-financing from the European Union. In addition to compensation provided by *Tierseuchenkassen*, private insurance is available for farmers to cover interruptions in livestock production. This private insurance covers consequential losses (production problems) and some direct losses, as well as the value of animals that exceeds the maximum amount paid by the *Tierseuchenkassen*.¹ Production insurance (*Ertragsschadenversicherung*) covers losses that stem from interruptions to and decreases in production, lower product quality, restrictions on sales (i.e. movement standstills), communicable diseases such as mastitis and foot diseases, accidents such as contaminated feed and ventilation breakdowns, theft, fire, and bans on selling certain potentially contaminated products such as milk. It also covers direct losses related to veterinary costs. According to the German Insurance Association (GDV), about ten insurance firms offer such coverage.² More than half of farmers in Germany have insurance policies that cover consequential losses; about half of all cows and 30% of all sows are insured in this manner (World Bank, 2010). Only farmers who generate income mainly from livestock production can buy such coverage.

9.1. Compensation schemes and incentives

Institutional framework

The legal foundation for *Tierseuchenkassen* is the Animal Disease Act (*Tierseuchengesetz*) in the revised version of 2004.³ However, this federal legislation only constitutes a legal framework, and laws in each federal state (*Bundesland*) are also applicable. Fifteen of Germany's sixteen federal states (*Bundesländer*) have their own *Tierseuchenkasse* controlled by a Governing Board (*Verwaltungsrat*) whose members are chosen by state agricultural ministries, county veterinary authorities and agricultural organisations (the *Tierseuchenkasse* of Bremen is covered by the *Tierseuchenkasse* of Lower Saxony). By way of example, the Governing Board of Lower Saxony's *Tierseuchenkasse* has thirteen members: nine farmers, two local government representatives, and two representatives of the state agriculture ministry (two veterinarians). The *Tierseuchenkassen* compensate livestock owners

who suffer financial losses due to epidemic disease outbreaks. Compensation amounts are based on prevailing market values and capped by federal law. The veterinary practitioners who conduct these assessments at the behest of the veterinary authority, as well as other stakeholders who perform needed duties during and following an outbreak, are also compensated. A number of variables can affect compensation amounts; see “Compensation” below.

Livestock holders have many responsibilities that are essential for the efficient and equitable operation of the *Tierseuchenkassen*. They must report as soon as possible any disease outbreak to an official veterinarian, cooperate in efforts to fight the disease, comply with all official instructions, and pay levies and report livestock figures correctly. Farmers who do not comply with these rules may have their compensation reduced or denied. Failure to quickly report an outbreak is also a criminal offence. According to an official with Lower Saxony’s *Tierseuchenkasse*, reducing compensation sends a strong signal to farmers regarding the importance of complying with regulations. Such reductions are evaluated on a case-by-case basis and determined according to the degree to which the farmer failed to comply with regulations.

In addition to compensating livestock holders for direct disease-related losses, *Tierseuchenkassen* also take important roles in improving animal health, by working to prevent and fight epidemics. *Tierseuchenkassen* also establish and finance actions designed to eradicate non-epidemic diseases such as Infectious Bovine Rhinotracheitis (IBR) in cattle.

Generally, state governments consult with the *Tierseuchenkassen* to co-ordinate their respective expertise, experience and financial resources regarding livestock epidemics. Certain tasks, such as monitoring and other prevention measures for non-epidemic diseases, are voluntarily implemented by some *Tierseuchenkassen*. Tasks such as compensation for rendering and disposing of animal by-products are mandatory for some *Tierseuchenkassen* under state law.

Compensation practices

The *Tierseuchenkassen* compensate livestock owners for direct losses caused by officially ordered culling of animals, for animals that die after destruction is ordered, and when a disease is detected after the death of an animal. *Tierseuchenkassen* cover the actual market value of animals, as well as costs for culling and disposing of the animals. Additionally, some *Tierseuchenkassen* (co-)finance associated disinfection costs. In Lower Saxony, for example, levies paid by livestock holders cover voluntary cleaning and disinfection services. Costs for losses incurred by healthy farms located within restriction zones are not covered. The *Tierseuchenkassen* generally cover diseases defined as notifiable epidemic livestock diseases, such as BSE, classical swine fever (CSF), avian influenza, bovine tuberculosis, foot-and-mouth disease (FMD), Aujeszky’s disease, scrapie, and anthrax.

For determining the amount of compensation payable, market value is assessed by district veterinary officers and capped by the Animal Disease Act, which serves to guarantee equal treatment for all livestock holders. Maximum compensation payments are EUR 3 068 per cow and EUR 1 278 per pig. In practice, assessed values are considerably lower than these maximums. There is no deductible or co-insurance. Animals that have died or been culled before notification of the disease are only indemnified by 50%.

The assessed value takes into account the market value on the day when the culling was ordered, based on factors such as the value of milk that a cow could have produced, whether it was a breeding animal, and the age of the animal (i.e. a 10-year-old cow is only compensated for the value of its meat). If the market value drops as an outbreak unfolds, the assessed value is lowered accordingly. A farmer who disputes an estimate can ask for a second assessment. According to the official from Lower Saxony’s *Tierseuchenkasse*, “The goal is to compensate

livestock holders in a way that they would be compensated in their normal business”. If regional markets have collapsed during an epidemic, the estimate is based on EU figures for buying animals out of the market. Payments for latter infections therefore may be smaller than for farms that were infected first, due to changes in market prices. This prevents adverse incentives for farmers to infect their own herd if market prices plummet after the initial outbreak. Payments to veterinary practitioners and other stakeholders involved with responses to outbreaks (such as companies involved in disinfection or destruction of animal carcasses) are based on estimates from the governing board of the *Tierseuchenkasse* in Lower Saxony. For farmers with bank credits, compensation is paid to the appropriate financial institution.

The government has not made any *ad hoc* compensation payments to livestock holders during the past ten years. Table 9.1 provides an overview of compensation payments to livestock holders from Lower Saxony’s *Tierseuchenkasse*, one of the largest in Germany, in the period 2005 to 2010:

Table 9.1. Compensation to livestock holders from Lower Saxony’s *Tierseuchenkasse*, 2005-2010

Year	Compensation (in EUR)
2005	417 336
2006	284 898
2007	951 345
2008	*
2009	**
2010	286 944

* Compensation for bluetongue disease in cattle, sheep and goats, and for low pathogenic avian influenza.

** Compensation largely for low pathogenic avian influenza.

Source: Provided by an official from the *Tierseuchenkasse* of Lower Saxony.

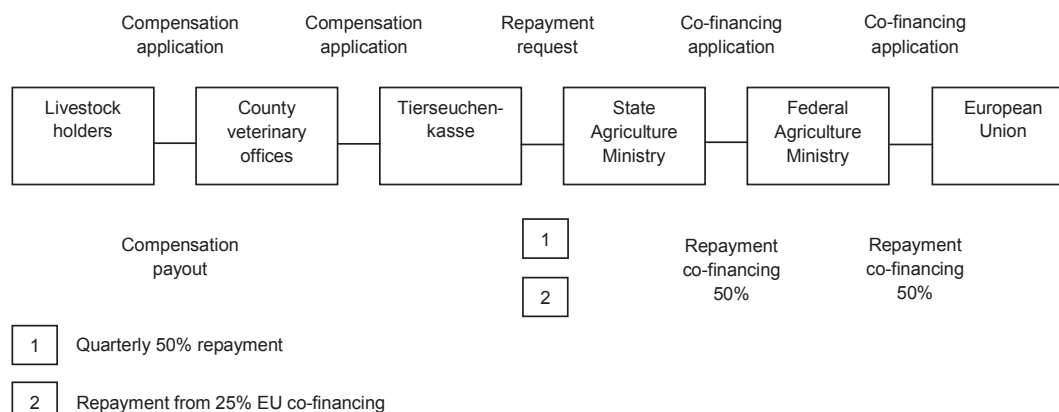
Financial structures

The financial responsibility for the *Tierseuchenkassen* lies with the federal states, which, in addition to partially funding the *Tierseuchenkassen*, are also responsible for deciding when to initiate disease control measures. The funding, cost-sharing, and reimbursement mechanism involves multiple players: livestock holders, the *Tierseuchenkassen*, federal state governments, and the European Commission. Livestock owners have to pay mandatory levies above a very small, minimum cession amount (*Bagatellgrenze*) to the Funds. In addition to levies, compensation payments to livestock holders are also supported by state governments and the European Commission. This mechanism is illustrated in Figure 9.1.

By way of example, for a livestock holder who incurs a disease-related loss of EUR 3 000, an approved compensation claim is paid by the relevant *Tierseuchenkasse*. Half of this amount comes from the affected state government and half from industry levies, with the European Union reimbursing up to 50% of the total claim. These reimbursement funds are channelled through the federal ministry to the applicable state government. The state then forwards half of the EU co-financing to the *Tierseuchenkasse*. In sum, this means that if the *Tierseuchenkasse* approves the EUR 3 000 claim, the livestock owner receives this amount from the *Tierseuchenkasse* while the *Tierseuchenkasse* receives EUR 1 500 from the federal state, and the overall amount of EUR 3 000 is submitted as a co-financing-eligible claim to the European Union. If the European Union approves the full 50% co-financing, EUR 1 500 are transferred to the state government (by way of the federal government). The *Tierseuchenkasse* then receives half of this amount (EUR 750) which leaves the same amount to be covered by levies. Therefore, through their levy payments, German livestock farmers

contribute 25% of the compensation costs, with 25% paid by the state, and 50% paid by the European Union. In practice, EU co-financing may ultimately be below 50% (because not all expenses are necessarily accepted as eligible costs), which increases the amounts contributed by livestock holders and states.

Figure 9.1. Flow of *Tierseuchenkasse* compensation and repayment funding



Source: Provided by an official from the *Tierseuchenkasse* of Lower Saxony.

The initial compensation claim is paid by the *Tierseuchenkasse* within 90 days. The government payment of 50% of the total claim is transferred from the state government to the *Tierseuchenkasse* with the next regular quarterly payment, and the EU co-financing payment is made after some time to the state government (via the federal government). Co-financing payments from the European Union to the German Government (which are ultimately partly forwarded to the *Tierseuchenkassen*) are shown in Table 9.2. Because of the significant time delay for the reimbursement process, co-financing payments from the European Union are often not reimbursed in the year of a disease outbreak, but at a later stage.

The Lower Saxony *Tierseuchenkasse* aims to maintain reserves totalling 5% to 7% of the market value of the insured livestock, accumulated from levies on farmers in periods without outbreaks. For large outbreaks, the *Tierseuchenkasse* would pay compensation, even if the reserves for the affected species are not sufficient to cover all expenses. The *Tierseuchenkasse* would then draw on funds accumulated for other species (on a loan basis)⁴ and would in the worst case be able to draw on funding from the federal state's budget to cover all compensation claims. Farmers repay their share of these payments through increased levies in the following years. Farmers' financial responsibilities therefore are the same for small and large outbreaks.

Levies paid by livestock holders are based on the particular species, the number of animals, and possibly other criteria, such as the weight and age of animals, herd size, the commercial use of animals, the risk of disease, and the absence of infectious diseases. They also depend on the expected costs for the general operation of each *Tierseuchenkasse* for each species; these costs can include prevention measures, the building of reserves or repaying debts stemming from previous reimbursements. Each farmer must annually report data on his/her livestock to the *Tierseuchenkasse*. Levies are determined by each *Tierseuchenkasse*'s Governing Board and then authorised by the state government.

In practice, the main types of levy differentiation used include regional risk, the absence of infectious diseases and, in some cases, the implementation of specific hygiene standards. A number of *Tierseuchenkassen* only significantly differentiate levies based on species. Species-

by-species levies for Lower Saxony (*Niedersachsen*) and Bavaria (*Bayern*) are shown in Table 9.3.

A *Tierseuchenkasse* can co-finance prevention measures, according to state law. Prevention measures include surveillance and monitoring for diseases including classical swine fever, bluetongue disease, avian influenza and various cattle diseases, as well as vaccination programmes.⁵ Lower Saxony's *Tierseuchenkasse* also pays for required ear tags for animal identification. These programmes are financed by levies from livestock holders, who have a role (through the *Tierseuchenkasse*'s Governing Board) in determining how their contributions are spent. The scope and type of prevention programmes financed through the *Tierseuchenkasse* system varies between federal states.

Table 9.2. Annual European Union co-financing payments received by the German government ('000 EUR) 2010

Disease	2005	2006	2007	2008
BSE		135 035	30 180	16 437
Scrapie	519 287	247 115	145 036	69 644
Avian influenza		306 573	320 000	*

* In 2008, the *Tierseuchenkassen* made EUR 2 million in advance payments to livestock holders, much of which has yet to be reimbursed by the European Union.

Source: Data provided by an official from the German Federal Ministry of Food, Agriculture and Consumer Protection.

Table 9.3. Per-animal per year levies of *Tierseuchenkassen* in Lower Saxony and Bavaria, 2011 (EUR)

Species	Levies Lower Saxony	Levies Bavaria
Cattle	13.00*	4.80
Horse	2.00	1.60
Pig	0.35	0.80
Sheep	1.35	1.25**
Chicken	0.0326 - 0.0673	0.025
Turkey	0.1560 - 0.4214	0.12
Goat	1.35	n.a.

* EUR 6 for cattle on BHV1-free farms

** Sheep over ten months old

Source: *Tierseuchenkasse* websites of Lower Saxony and Bavaria.

Outbreaks and practical experiences

Germany's *Tierseuchenkassen* system operates effectively and efficiently, both during crises and in “peace-time”, according to an official with the Federal Ministry of Food, Agriculture and Consumer Protection. Farmers generally receive their compensation in a timely, orderly fashion so they are able to restock their herds. Several other positive features of the system have been highlighted, according to this official and a representative of Lower Saxony *Tierseuchenkasse*.

First, the financial risks associated with livestock disease outbreaks, as well as the responsibility for covering the direct losses they provoke, are shared equally among each federal state and livestock farmers. This avoids mixing financial responsibilities among regions which largely have separate epidemic risk profiles. Each major livestock sector finances only its own losses, which may lead to the development of a sense of responsibility. Because compensation payments are funded in part by their levies (at least 25%), livestock owners are likely incentivised – to some extent – to avoid risky behaviour.

Second, the same stakeholders who are required to participate and thereby are “embedded” in the system – livestock holders, various associations, different levels of government, and others – also work closely together during animal disease outbreaks. *Tierseuchenkassen* design the logistics of these responses to be quick, goal-oriented and efficient.

Third, equal treatment and transparent operating procedures were reported by the official from the Lower Saxony *Tierseuchenkasse* as strengths of the system. Livestock owners, with the exception of the limited number of states in which heightened hygiene standards result in lower levies, pay the same rate (assuming they are owners of the same species and reside in the same state). And, with respect to transparency, livestock owners are informed of the reasoning behind reductions or denials of their compensation claims.

Additionally, Lower Saxony's *Tierseuchenkasse* pays fees for services provided by veterinarians (e.g. in the framework of surveillance/vaccination programmes) to livestock holders, who then pass on the payments to veterinarians. This is another layer of transparency – livestock holders directly see the monetary benefit of being a contributor to the *Tierseuchenkasse*. Administrative costs of *Tierseuchenkassen* are reportedly held to less than 5% of their total expenditures.

Membership in the system itself has a material effect on livestock holders, said the official from the *Tierseuchenkasse* of Lower Saxony: “Livestock holders know what is going to happen in case of a disease and how much money they will get if they act quickly and help in stopping the disease from spreading.” The official said that risks can be reduced if livestock holders accept the system and identify with it, because they will feel they are operating “on the safe side.” Still, the official said, misuse can never be ruled out.

A variety of other advantages of the system have been noted.

- Levies collected, as well as compensation paid for each livestock type, are held and accounted for separately, and different *Tierseuchenkassen* are not co-mingled. The responsibilities of specific livestock sectors and regions are therefore separated, and ensure that farmers are appropriately incentivised to invest in prevention measures and self-monitoring within their region.
- Indemnification is based on the principle that overcompensation must be avoided for all stakeholders. Animal values are therefore not based on *ex ante* market prices, and the costs for personnel (e.g. assessors, additional staff for eradication) are based on their prevailing wages.

A number of rules and policies have been put in place, nationally and at the state level, to encourage more accountability among livestock holders.

- Farmers must immediately report an outbreak or suspicion of an outbreak to veterinary officials. Farmers who fail to do this, or who do not comply with other legislative requirements, can have their compensation reduced or even completely withheld by the *Tierseuchenkasse*. “Cases of reduced compensation send a signal – they show the importance of conforming with the regulations,” said the official from Lower Saxony. Dead animals are only indemnified by 50% of their assessed value, which also provides an incentive for quick reporting of infections.
- Lower Saxony’s *Tierseuchenkasse* charges lower levies for livestock holders whose farms are free from bovine herpes virus Type 1 (BHV1), creating a “high” level of pressure on farmers to continue to institute animal health measures. As of 2011, BHV1-free farms paid EUR 6 per animal; farms not declared free of the virus paid EUR 13 per animal, with the difference being equal to the cost of vaccines and medical examinations. From 1996-2000, Lower Saxony collected lower levies from farms that met specific hygiene standards, but this was discontinued following an analysis showing that losses were not significantly lower for these farms.
- In the state of Mecklenburg-Vorpommern, levies for pigs are 50% lower for farms participating in a programme with special hygiene standards that are checked twice a year by veterinary authorities.

According to the official with the German Federal Ministry of Food, Agriculture and Consumer Protection, the primary goal of the *Tierseuchenkassen* system is not to reduce the risk or number of disease outbreaks, but rather to equitably compensate farmers for losses from livestock diseases (thereby reducing individual economic risk). The official added, however, that because all livestock holders are required to pay into the system, they have an incentive to comply with regulations – “because it’s their money.”

While the *Tierseuchenkassen* system and the laws and regulations that govern it have not undergone notable changes in recent years, efforts to address certain issues and concerns are under consideration. For example, to reduce the need to declare restriction zones, measures to increase the level of preparedness during “peace-time” are under discussion and relevant measures have been taken to improve logistics for responding immediately to a disease outbreak. For example, the Lower Saxony *Tierseuchenkasse* has stand-by agreements for technical and personnel resources with private companies, e.g. for disinfection and carcass destruction purposes. Since 2007, Lower Saxony’s response system has been improved in order to carry out culling with a 1-kilometre radius within 24 hours, while following proper animal welfare procedures. According to the official with Lower Saxony’s *Tierseuchenkasse*, “Our *Tierseuchenkasse* is like a fire department: we have to act quickly. We cannot prevent an epizootic disease outbreak, but we are able to cut the losses. The mechanism does not decrease the risk of an outbreak, but the outbreak can be kept within bounds.”

9.2. Concluding remarks

The main features of Germany's compensation scheme are highlighted in Table 9.5.

Table 9.5. Key features of Germany's compensation scheme

Name of scheme	Tierseuchenkassen (Animal Disease Funds)	
Legal basis	Tierseuchengesetz (Animal Disease Act) and applicable federal state (Bundesland) laws.	
Institutional framework		
Scheme governance	The federal <i>Tierseuchengesetz</i> (Animal Disease Act) provides the legal framework for the <i>Tierseuchenkassen</i>, which are then administered by each state which has established its own Fund. State governments supervise the <i>Tierseuchenkassen</i> and set out eradication and prevention measures, which are jointly implemented by the <i>Tierseuchenkassen</i> through financing and supervising by the local veterinary authorities. Each <i>Tierseuchenkasse</i> has a Governing Board, whose members are chosen by state agriculture ministries, county veterinary authorities, and agriculture organisations. Levies are determined by the <i>Tierseuchenkassen</i> and authorised by state governments. State governments consult with the <i>Tierseuchenkassen</i> on matters related to expertise, experience, and finances.	
Main stakeholders	Federal states; state agriculture ministries Veterinary officials Agriculture organisations Farmers’ representatives.	
Is private insurance coverage available?	Some private companies insure against losses caused by epidemic livestock diseases as well as consequential losses related to interruptions and decreases in production, lower product quality, restrictions on sales, communicable diseases, accidents such as contaminated feed and ventilation breakdowns, theft, fire, and bans on selling products.	
Compensation		
Overview of the scope of compensation	Livestock holders are compensated for direct losses caused by officially ordered culling, losses from animals that die after destruction was ordered, and when a disease is detected after the death of the animal. Compensation includes the actual value of the animals, and culling and disposing costs.	
Are consequential losses covered?	Only direct losses are indemnified by the <i>Tierseuchenkassen</i>.	
Stakeholders eligible for compensation	Livestock holders Assessors Private companies/contractors that are involved in culling, destruction of carcasses, disinfection, etc.	Compensated for the actual value of animals, and culling and disposing costs. Paid according to guidelines of agriculture ministries. Paid according to arrangements between <i>Tierseuchenkassen</i> and the companies/contractors
Rules for valuation	The assessed value of animals is based on the market value on the day when the culling was ordered. A farmer who disputes an estimate can ask for a second assessment.	
Conditionality	Farmers must report outbreaks as soon as possible, comply with all relevant laws and regulations, collaborate in efforts to fight the disease, follow all official instructions, pay their levies, and report livestock figures correctly.	
Time frame for payment	Compensation is to be made within 90 days of slaughtering of livestock.	
Diseases covered	Notifiable epidemic livestock diseases are covered, such as classical swine fever, BSE, avian influenza, bovine tuberculosis, African horse flu, foot-and-mouth disease, Aujeszky’s disease, scrapie, and anthrax.	
Differentiated treatment of diseases	Compensation payments do not depend on the type or extent of a livestock disease.	

Financial structure

Funding sources and mechanisms	Following a series of payments and repayments involving livestock holders, <i>Tierseuchenkassen</i> , state governments and the European Union, 25% of claims is eventually covered by livestock holder levies, 25% is covered by state governments, and up to 50% is refunded by the European Union. If the EU's refund is less, then the livestock holders and federal states share the difference.
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Cost-sharing

In addition to mandatory levies paid by livestock owners, compensation payments are also supported by state governments and the European Union. The European Union reimburses the *Tierseuchenkassen* and state governments for up to half of the compensation payments to livestock owners. Some *Tierseuchenkassen* finance or co-finance prevention measures in 'peace-time', such as disease surveillance, monitoring, or vaccination programmes.

Practical experience

Incentives provided (for prevention/biosecurity practices and early notification)	Compensation can be reduced or denied if livestock holders do not quickly report disease outbreaks, or do not comply with rules, laws, and instructions. Dead animals are indemnified by 50% of their assessed value, providing an incentive for quick reporting of infections. Some <i>Tierseuchenkassen</i> charge lower levies for farms that are free of certain diseases or that have higher hygiene standards.
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Efforts to mitigate potentially adverse incentives

The responsibilities of specific livestock sectors and regions are kept separate, incentivising farmers to invest in prevention and monitor each other in case of an outbreak. Animal value is based on market value at the reporting date. Costs for personnel are based on what the officials would have earned in their regular occupations.

Notes

1. Private insurance is not publicly subsidised and purchasing such insurance is not a prerequisite to receiving compensation through the *Tierseuchenkassen*.
2. The market leader, *Vereinigte Tierversicherung*, is a subsidiary of the insurance group R+V Insurance, one of the largest insurance groups in Germany. In 2009, *Vereinigte Tierversicherung* reported EUR 37 million in gross revenue and 47 000 contracts. These figures include transport insurance for horses and insurance for the recovery of high-value animals. A pool of other regional companies including *Uelzener Allgemeine* and *VKB* collect premiums of about EUR 5 million per year for production insurance coverage (Food Chain Evaluation Consortium, 2006; website of *Vereinigte Tierversicherung*, 2011).
3. Germany's first legislation related to *Tierseuchenkassen* dates to 1880.
4. This occurred at the Lower Saxony *Tierseuchenkasse* in 1994, when money from the reserve for cows was loaned to the reserve for pigs. With the exception of such loans, there is no cross-financing among different species.
5. Germany's BSE testing programme is separate from the *Tierseuchenkassen* system. Fees that have to be paid to the slaughterhouses generally cover the costs for BSE-testing. But these costs are decreased in accordance with the costs of the BSE-test which were reimbursed by the European Union.

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Chapter 10.

Netherlands

This chapter describes important features of the animal disease management system in the Netherlands. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The second section analyses compensation schemes and the system of incentives, including institutions, compensation practices, financial structures, and incentives for notification and prevention. The concluding table summarises the main characteristics and challenges.

Most notable about the Netherlands' animal populations are their relative densities, which are between three and five times higher than those in Germany or Viet Nam. Overall, Dutch agriculture utilises more than half of the Netherlands' surface area to generate a production value of EUR 24 billion (2008), with EUR 9.7 billion derived from livestock products (Dutch Ministry of Agriculture, Nature and Food Quality, 2010a, pp. 35, 51).

During the past five years, the densely populated Dutch livestock industry has experienced a series of OIE-notifiable epidemic disease outbreaks. Bluetongue outbreaks occurred in 2006, 2007, and 2008. The year 2010 saw an outbreak of low pathogenic avian influenza (H7) in poultry which prompted the destruction of 28 000 birds, and three similar 2011 outbreaks involving the H7N1 and H7N7 low pathogenic serotypes of avian influenza resulted in the destruction of an additional 190 000 birds. Finally, between October 2009 and 21 July 2011, 101 outbreaks of Q fever were notified to the OIE, involving 95 dairy goat farms and 3 dairy sheep farms.

10.1. Compensation schemes and incentives

The Dutch approach to compensation of livestock holders' direct losses resulting from epidemic livestock disease outbreaks is through the Animal Health Fund, a public-private partnership based on a cost-sharing agreement with the private sector. The government's basic operating principle is to employ compensation "where a control measure involves the culling of animals or the destruction of products" (Dutch Ministry of Agriculture, Nature and Food Quality, 2008, p. 39). Meanwhile, consequential losses have historically been viewed as a business risk which should be borne by the private sector. However, the Ministry of Economic Affairs, Agriculture and Innovation¹ has recently undertaken a sustained effort to aid the development of a consequential losses compensation scheme which, once operationalised, would likely be managed by the private sector.

Private insurance coverage for risks from epidemic livestock diseases is available in the Netherlands, but its uptake among livestock holders is too limited to affect the functioning of the compensation scheme operated through the Animal Health Fund. Indeed, prior documents and research² (Dutch Ministry of Agriculture, Nature and Food Quality, 2008, p. 39; Melyukhina, 2011, pp. 32, 56; van Asseldonk *et al.*, 2006, p. 121; World Bank *et al.*, 2006, p. 16) have suggested that livestock holder participation in private insurance schemes in the Netherlands is below 10%, and that the scope of available coverage is comparatively limited. Unlike in neighbouring Germany, losses resulting from movement restriction zones have not generally been covered by private insurance schemes (World Bank, 2006, p. 16).

Institutional framework

The public-private cost-sharing compensation scheme in the Netherlands functions through the Animal Health Fund which also finances the control costs of livestock disease outbreaks (e.g. costs resulting from general response mobilisation, stamping-out measures, emergency – suppressive or protective – vaccination, or maintenance of standstill zones) as well as "peace-time" disease monitoring and structural costs. The Animal Health Fund was established in early 1998 partly as a result of the extensive 1997 Classical Swine Fever epidemic (Horst *et al.*, 1999, p. 34), and the current five-year agreement framing its administration runs from the beginning of 2010 through to December 2014. Previously, a national stamping-out fund, first operationalised in 1988, had existed (Horst *et al.*, 1999, p. 32).

The Animal Health Fund's legitimacy is derived both from legislation – the Animal Health and Welfare Act (*Gezondheids- en welzijnswet voor dieren*) – and agreements (*Convenant financiering bestrijding besmettelijke dierziekten LNV – PVV – PPE – PZ*)

between the former Ministry of Agriculture, Nature and Food Quality³ and three Product Boards: Livestock and Meat (PVV), Poultry and Eggs (PPE), and Dairy Products (PZ). The Animal Health and Welfare Act established the Fund and set out which measures it can implement; the agreements prescribe the Product Boards' financial contribution ceilings and the five-year renegotiation periods.

As defined by the OECD (2011, p. 183), the Product Boards which negotiate on behalf of the different sectors of the livestock industry are "...vertical industrial organisations unifying businesses involved in the same product, but which represent different levels of the product value chain." The Product Boards incorporate product chain members from farmers to retailers, including trade and production activities within their respective sectors. The Boards of Governors of the three Product Boards which are parties to the Animal Health Fund negotiations include representatives of livestock holders.

The Ministry is the government representative to the cost-sharing negotiations, and the agent responsible for developing – in co-operation with other organisations potentially affected by a disease outbreak – the prevention and control policies for the various applicable livestock diseases. It also provides the day-to-day administration of the Animal Health Fund.

Livestock owners are also key stakeholders with respect to compensation transfers made via the Animal Health Fund. They also bear responsibilities, including the legal obligation to notify a disease outbreak as soon as possible and to maintain established hygiene/sanitary standards on their farms.

Compensation practices

As previously stated, direct losses incurred as a result of disease control measures are the only type eligible for compensation through the Animal Health Fund. However, the conceptualisation of direct losses exceeds the value of destroyed or pre-emptively culled animals to include such items as laboratory expenses, fees for the transportation of animals, and disinfection costs. Moreover, the destruction of animal products such as eggs, milk and feed also enters into the sum of direct losses.

Compensation is payable to livestock owners, both commercial and non-commercial, and to veterinarians. The latter group can receive compensation for losses incurred when their work at an infected area during the course of an epidemic bars them from visiting other livestock holdings in the subsequent 72-hour period. The distinction between commercial and non-commercial livestock owners is notable because, while the non-commercial sector is not represented on the Product Boards and does not contribute financially to the Animal Health Fund, its members are compensation-eligible. These payments, covered in full by the central government, aim to incentivise early notification and full co-operation with disease control measures on the part of private individuals and hobby farmers.

Market value serves as the basis for calculating compensation payments for livestock. After suspicion of a disease outbreak has been reported, a government veterinarian performs an initial inspection of the holding and notes the health status – dead, visibly sick, or healthy – of the animals. Then, the date of the Ministry's decision to implement control measures serves as the reference point for assessing market value.⁴ This procedure is undertaken by independent evaluators who, relying on market value tables maintained for the Ministry by the LEI Institute at Wageningen University and Research Centre as guidelines, take into account such factors as animal category, age, purchasing price, feed/housing costs, and the date on which the ministerial decision to respond with control measures was taken. Culled healthy animals are indemnified at 100% of their determined market value, visibly sick animals at 50%, and livestock holders receive no compensation for animals dead at the time of the initial inspection.

A type of appeals process is built into the value assessment procedure: if either the government or the livestock holder is dissatisfied with the initial market value calculation, they can ask for a re-evaluation, to be conducted by a team of three experts. In its compensation-related practices, the Animal Health Fund does not distinguish between cases of “limited” outbreaks and “catastrophic” outbreaks – the same procedures are followed in both scenarios. Generally, compensation is paid within one month after the valuation, and the government aims “to ensure that payments are made no later than 60 days after depopulation/destruction” (Dutch Ministry of Agriculture, Nature and Food Quality, 2003).

As indicated above, when livestock holders suspect an outbreak, they must notify the government of their discovery as quickly as feasible. Failure to do so could lead to a reduction in compensation if conclusive proof of an abnormally long delay emerged. However, such late notification cases have not been frequent. This is likely in part a result of the legal requirement to notify, as well as the halved compensation payments for visibly sick animals and the non-existence of compensation for animals dead at the time of veterinary inspection. Similarly, well-evidenced failure to meet or maintain established hygiene/sanitary standards could also provide the basis for economic sanctions if it were found to be the cause of an outbreak.

With respect to government issuance of *ad hoc* payments to livestock holders (i.e. compensation unrelated to the provisions of the Animal Health and Welfare Act), the recent Q fever epidemic did prompt such a payment. Significant numbers of pregnant female goats were culled beginning in December 2009, and a breeding ban was subsequently introduced because the disease can spread quickly through the birthing process. Female goats without young were not culled, thus remaining a financial responsibility for their holders. These holders were later compensated – with payments per animal – for the disadvantage they experienced as a result of the breeding ban and their inability to use the female goats for milk production. The decision to compensate in this case was made at the ministerial level.

Compensation for direct losses under the Animal Health Fund is covered by the government-industry agreement for the following diseases: avian influenza, African swine fever, classical swine fever, Q fever, bluetongue, bovine spongiform encephalopathy (BSE), bovine tuberculosis, brucellosis, foot-and-mouth disease, Newcastle disease, scrapie, brucella melitensis, swine vesicular disease, and bovine leucosis.

From one perspective, the Netherlands’ compensation scheme does not differentiate between types of livestock diseases (e.g. between human-health-threatening zoonoses and diseases that merely affect animal production), because the procedures followed for assessing and transferring compensation payments are the same. Nevertheless, there is to some extent financial differentiation between disease types, because the financial ceilings that the Product Boards agree to meet if necessary are in part informed by the past control costs of diseases relevant to each sector, i.e. livestock and meat, poultry and eggs, and dairy products. Additionally, the procedure for determining the contribution ceilings for three particularly significant diseases – avian influenza, classical swine fever, and foot-and-mouth disease – is primarily based on a risk assessment and estimation of control costs (though the contribution ceilings are still subject to negotiation).

As noted in a recent OECD report (Melyukhina, 2011, pp. 54, 56), discussions are ongoing in the Netherlands regarding a potential compensation scheme for livestock holders’ consequential losses. Though informal discussions on the matter have been taking place since at least 2004 (following the 1997/98 Classical Swine Fever (CSF), 2001 FMD, and 2003 avian influenza outbreaks), an agreement with the sector to work toward a solution was formalised near the end of 2009. The ongoing discussions seek a consequential losses scheme that, through incentivising full co-operation with control measures, aids in successful disease eradication and promotes business continuity.

These developments have partly resulted from the use of widespread culling, including of healthy animals, to control the previous CSF and FMD outbreaks. Those experiences increased resistance to traditional stamping-out as a disease eradication method, while prompting a move toward emergency vaccination-based control measures (where feasible) and discussion on how to approach related consequential losses.

While the principal stakeholders involved in the current consequential losses discussions are the same organisations that participate in the Animal Health Fund negotiations, namely the Product Boards and the Ministry, any scheme that may emerge from the discussions would likely be a separate entity with no formal relationship to the Fund. Due to the government's long-standing principle that consequential losses are the responsibility of the private sector, it is envisioned that such a scheme would be managed by the sector, potentially with limited assistance from the Ministry. Accordingly, the involvement of private insurance companies is being explored.

With respect to the scope of consequential losses covered by the scheme, the emphasis is on developing compensation procedures only for livestock holders. Thus, the scheme would not be relevant to third-party stakeholders, such as feed producers, who also might incur business interruption losses during an epidemic disease outbreak.

There are two guiding principles on the types of losses to be covered: 1) to avoid potentially adverse incentives related to illegal animal movement, there should be no financial distinction between the livestock holder whose farm lies in a restriction zone and his neighbour whose farm is inside a culling zone; and 2) in order to incentivise full co-operation in outbreak responses involving emergency vaccination, there should, in the final accounting, be no financial disparity between vaccinated farms and culled farms. It follows from these principles that the preparatory work for the consequential losses scheme has been focused on two somewhat specific outbreak response types differentiated by whether or not widespread emergency vaccination is to be used.

The levels at which compensation payments would be set are being explored primarily by the LEI institute, which also maintains market value tables for the Ministry. As an example, a recent report (van Horne *et al.*, 2011) investigated the establishment of compensation levels for a stamping-out response to Avian Influenza (i.e. a response involving a culling zone and a restriction zone). Looking specifically at the hatching eggs sector (as opposed to table eggs or chicken-for-meat broiler farms), the report team attempted to determine a compensation amount per egg which would take into account the price difference between the market value of a hatching egg and the value of that same egg in a restriction zone where it cannot be hatched and must instead be used in the processing industry – for instance, to produce shampoo. In addition, the compensation amount per egg would potentially take into account continuing costs, such as for labour, utilities, and animal feed, borne by restriction-zone farms during an outbreak. The Ministry has also looked into determining appropriate compensation amounts for vaccination-related consequential losses in the swine, veal, and dairy sectors. One difficulty here lies in determining the price difference between an optimally slaughtered animal, whose various parts go to their individual profit-maximizing markets, and a vaccinated animal that must be slaughtered in a different, low-profit manner.

In sum, the Dutch experience suggests that developing equitable and effective compensation levels for consequential losses involves relatively complex and sector-specific calculations of the multi-layered business interruption losses faced by holders of restriction zone-bound or vaccinated animals. That the work described here has so far primarily focused only on avian influenza, CSF, and FMD suggests the extent of the effort required to establish a consequential losses scheme covering several additional diseases and sectors.

Currently, the Dutch Government maintains its principle that the private sector should wholly fund any compensation scheme for consequential losses. If implemented as an entirely

sector-financed programme, the consequential losses scheme would differ in a significant way from the financing arrangement employed by the Animal Health Fund. Another potentiality is also being explored: whether “Art. 68, 69, 70 and 71 of Council Regulation (EC) No. 73/2009 of 19 January 2009 ... can be used to allow premium subsidy of farmers by [Member States]” (Bergevoet *et al.*, 2011, p. 68). If such premium subsidisation were determined to be feasible, the consequential losses scheme might gain a public-money component. Notably, current Ministry thinking is that a sector-financed scheme would be privately managed, whereas the latter scenario, involving public money, would likely result in public governance of at least the scheme’s subsidy component.

The Ministry reports a general sense of urgency among the discussion partners, resulting from the knowledge that, despite the prevalence of preventive and monitoring measures in the Netherlands, a disease outbreak leading to sizeable consequential losses could occur at any time. According to the Ministry, there is also stakeholder consensus on the goal of gaining maximum livestock holder participation in any operationalised scheme. Widespread participation is seen as key to ensuring full co-operation with government-implemented control measures, especially emergency vaccination programmes.

One area in which progress has proven slow is private insurer participation. Obstacles in the continuing discussions have included the novelty of the instrument for some insurance companies and associated questions on the types of premiums to set. Additionally, there is the previously mentioned obstacle of determining appropriate compensation levels which neither overcompensate nor fail to incentivise complete compliance with control measures that inherently lead to consequential losses, i.e. adherence to restriction zone rules and co-operation in emergency vaccination programmes.

Financial structures

Funding of expenses incurred by the Animal Health Fund during an outbreak can come from three sources: the Product Boards, the Dutch Government, and the European Union.

The livestock industry’s contribution ceilings in the event of an outbreak, which vary by sector and disease (Table 10.1), are set during the formal negotiations held every five years between the Product Boards and the Ministry. When an outbreak occurs and the Ministry implements control measures, the government initially covers the costs of those measures, including compensation payments, before invoicing the Product Board liable for the infected livestock species up to the applicable contribution ceiling. The Product Board then responds financially with its reserves. Any assumed cost is subsequently passed on to livestock owners within the Product Board’s sector in the form of increased levies.

For costly outbreaks which exceed a Product Board’s contribution ceiling for the species involved, the Dutch Government pays the overrun costs and is, in turn, partially reimbursed by the European Union, which co-finances losses resulting from substantial disease outbreaks. As described above, the central government also pays the full outbreak control costs of the non-commercial sector, including compensation payments for direct losses. In sum, the Product Boards fully cover outbreak control costs up to the negotiated contribution ceilings, with the Dutch Government – and some EU co-financing – absorbing all costs above those limits.

Notably, “peace-time” disease monitoring and related structural costs are distinguished from post-outbreak control costs in the five-year agreements. The former are subject to true two-way cost-sharing: these expenses are split on a 50/50 basis between the central government and the livestock industry. Accordingly, the levies through which the Product Boards raise their sectors’ contributions can be seen as both *ex ante* and *ex post* cost-sharing mechanisms. On the one hand, the levies contemporaneously finance the industry’s 50% share of “peace-time” disease monitoring costs and are used to build up some reserve levels for

future outbreaks; on the other hand, their level is adjusted by the Product Boards in an *ex post* manner to enable the Product Boards to meet their financial commitments resulting from previous outbreaks. Generally speaking, however, the bulk of a given Product Board's liability resulting from a disease outbreak will be financed through an *ex post* levy increase. Due to the sharing of “peace-time” costs, public financial contributions are also both *ex ante* and *ex post*, though they assume the latter form only when the cost of an outbreak exceeds the industry's relevant contribution ceiling.

The levy system is not differentiated by the risk profiles of regions or individual livestock holdings, though some of the latter may adhere to self-elevated biosecurity standards. Rather, livestock holders contribute to monitoring and control costs more straightforwardly – their levies are based on the size of farm, on size of herd, or on quantity of products produced, depending on the sector. Arguably, opting for such non-differentiation foregoes the opportunity to incentivise increased biosecurity or risk reduction efforts (Dutch Ministry of Agriculture, Nature and Food Quality, 2008, p. 40). However, this potential outcome is likely balanced to a certain extent by livestock holders' collective knowledge that they will pay – up to the contribution ceiling – the entirety of an outbreak's direct control costs through increased levies and additionally be burdened with consequential losses.

Table 10.1. Producer contribution ceilings to the Animal Health Fund, 2010-2014

Livestock type	Responsible Product Board	Maximum contribution*	Specified earmarks
Cattle	Dairy Board	EUR 19.5 million	n.a.
Pigs	Livestock and Meat	EUR 68 million	EUR 42 million solely for the monitoring and control of African swine fever and swine vesicular disease
Poultry	Poultry and Eggs	EUR 26 million	EUR 2 million solely for the monitoring and control of Newcastle disease
Sheep and goats	Livestock and Meat	EUR 4.52 million	EUR 1.35 million solely for the monitoring and control of scrapie

* The 2010-2014 covenant specifies that the Product Boards' maximum contributions can be adjusted annually based on changes in the size of the animal herd (with the 2009 agricultural census as the point of reference) and the consumer price index (with January 2009 price levels as the point of reference).

Source: Dutch Ministry of Agriculture, Nature and Food Quality (2010b).

Outbreaks and practical experience

The 2010-2014 agreement between the Product Boards and Ministry of Economic Affairs, Agriculture and Innovation marks the third such agreement on the financing of the Animal Health Fund. Following approximately a decade of operations, the latest round of negotiations was, from the Ministry's perspective, marked by general contentedness amongst stakeholders with the cost-sharing scheme. Only a few relatively minor modifications were made to the agreement, including costs for a new crisis facility at a slaughtering house and additional monitoring of bluetongue. The main pillars of the agreement, as well as the compensation-related practises of the Animal Health Fund, remain intact. Table 10.2 presents a record of the major epidemics that have triggered compensation transfers from the Animal Health Fund since it was established, as well as the impact, if any, on the functioning of the compensation scheme.

The cost-sharing-based compensation scheme is viewed by the Ministry more as an effective tool for balancing stakeholders' financial liabilities than as an incentivising

mechanism through which to encourage biosecurity and risk reduction. As the Ministry reported, the conclusion cannot be drawn that the Animal Health Fund has helped to prevent disease outbreaks. Nonetheless, the Ministry feels that the scheme adds to overall awareness of livestock holders' animal health responsibilities, not least because the holders have to pay levies annually and are knowledgeable about the contribution ceilings and prospective levy increases in the event of an outbreak.⁵ Also of note is that the compensation scheme administered through the Animal Health Fund has not completely eliminated the government's sense of urgency to provide *ad hoc* compensation during intense cases, as shown by the extraordinary compensation payments made during the recent Q fever outbreak.

Table 10.2. Recent major outbreaks leading to compensation payments

Disease	Time period	Scope of outbreak and compensation	Subsequent modifications to scheme (if any)
Classical Swine Fever	1997/98	Large-scale: over 11 million pigs destroyed, with total cost, including direct control costs and consequential losses, near EUR 2.5 billion	Contributed to development and operationalisation of the Animal Health Fund, which initially covered just the swine sector
FMD	2001	Large-scale: approximately 41 000 goats and sheep, as well as 121 000 pigs, destroyed, with total cost, including direct control costs and consequential losses, over EUR 750 million	Similar to the 1997/98 CSF outbreak, the widespread use of culling (including of healthy animals) prompted societal resistance toward stamping-out as a control measure and in turn led to initial thinking on consequential losses associated with other potential control methods such as emergency vaccination
Avian Influenza	2003	Large-scale: 30 million animals destroyed, with direct control costs of EUR 270 million	Also promoted discussion on moving away from stamping-out control measures and what types of consequential losses might result from different eradication strategies – the previously mentioned report on compensating for hatching egg consequential losses focuses on an Avian Influenza outbreak
Q Fever	2009-2011	Around 100 farms affected, with 11 600 animals destroyed; <i>ad hoc</i> compensation payments made as a result of a breeding ban and inability of affected holders to sell milk products	None known
Low Pathogenic Avian Influenza	2010/2011	Approximately 28 000 birds destroyed in 2010 and 190 000 birds destroyed in 2011	None known

Source: Horst *et al.*, (1999); Huirne *et al.* (2002) and Mourits *et al.* (2008) in Melyukhina (2011); OIE WAHID Interface (2011).

With regard to the potentially adverse incentives associated with compensation, the Fund has aimed to avoid overcompensation through the guideline of only compensating for the market value of holders' losses. To date, this compensation has been limited to the market value of direct losses, which raises the issue of potentially adverse incentives linked to the scheme's non-compensation of consequential losses. Livestock holders in movement restriction zones are arguably financially disadvantaged (relative to holders in culling zones) by their co-operation with the restriction measures, because while the economic value of their livestock has fallen post-outbreak, they still experience livestock care and general operating costs. Moreover, when considering diseases for which protective emergency vaccination is now the preferred control measure, such as CSF and FMD in the Netherlands,⁶ the associated (and uncompensated) consequential losses, namely the decreased value of vaccinated animals and their products, also put fully

cooperating livestock holders in the emergency vaccination zone at a financial disadvantage. That the now-formalised discussions on developing coverage for consequential losses are targeted at specifically these types of losses – those related to restriction zones and emergency vaccination – suggests that these potential issues are well known and that solutions are being sought.

10.2 Concluding remarks

The main features of the Netherlands compensation scheme are highlighted in Table 10.3.

Table 10.3. Key features of the Netherlands compensation scheme

Name of scheme	Animal Health Fund	
Legal basis	The Animal Health and Welfare Act (<i>Gezondheids- en welzijnswet voor dieren</i>)	
Institutional framework		
Scheme governance	The compensation scheme functions through the Animal Health Fund, a public-private partnership whose funding is based on five-year agreements between the Ministry of Economic Affairs, Agriculture and Innovation and three Product Boards. The Ministry is responsible for daily administration of the Fund and for preparing prevention and control policies for the relevant epidemic livestock diseases.	
Main stakeholders	Ministry of Economic Affairs, Agriculture and Innovation (before organisational restructuring in 2010, the Ministry of Agriculture, Nature and Food Quality (LNV)) Product Boards for Livestock and Meat, Poultry and Eggs, and Dairy, which represent an array of product chain members from their respective sectors Livestock holders	
Is private insurance coverage available?	Private insurance for certain risks related to epidemic livestock diseases is available, but its uptake rate among livestock holders is below 10% and the scope of coverage is more limited than in neighbouring Germany.	
Compensation		
Overview of the scope of compensation	Compensation is to-date only available for direct losses that result from government-ordered disease control measures. These losses include the culling of animals and the destruction of products (e.g. eggs, milk, and feed), as well as items such as laboratory fees, animal transportation costs, and disinfection expenses. Both commercial and non-commercial holders are compensation-eligible, as are veterinarians under certain circumstances.	
Are consequential losses covered?	The Animal Health Fund does not compensate for consequential losses and the Dutch Government maintains the principle that such losses are a private sector responsibility. Nonetheless, the Ministry is currently assisting in development of a potential compensation scheme for consequential losses which, once operationalised, would likely be administered by the private sector and involve private insurance.	
Stakeholders' eligibility for compensation	Commercial livestock holders	Receive compensation for direct losses: culled animals, destroyed animal products, and associated expenses. Consequential losses are not currently compensated.
	Non-commercial smallholders	Are compensated for direct losses in the same manner as commercial holders (cost paid entirely by the central government).
	Veterinarians	Can be compensated for financial losses resulting from a 72-hour ban on farm visitations following a Ministry-ordered visit to an infected area.
	Dutch Government (coverage of expenses)	Until the applicable contribution ceiling is reached, the private sector (via the Product Boards' levies) reimburses the government for expenses from outbreak control measures (e.g. culling, vaccination, maintenance of restriction zones).

Rules for valuation	Valuation of compensation payments is based on market value. Animal/product value tables produced by the LEI Institute are used as guides by independent evaluators who assess market value (based on the date that control measures were ordered by the Ministry). The calculation includes such factors as animal category, age, and purchasing price. Animals healthy at the time of veterinary inspection are indemnified at 100% market value, visibly sick animals at 50%, and dead animals at 0%. Initial valuations can be appealed by either the holder or the government. This prompts a re-evaluation by a team of three experts.
Conditionality	Compensation paid to livestock holders can be reduced if they do not notify suspicion of a disease outbreak to the government as soon as possible or fail to meet/maintain established sanitary standards. According to the Ministry, such cases have been rare.
Time frame for payment	Generally, compensation is paid within one month after the valuation, and the government tries to guarantee that payments follow depopulation/destruction by no more than 60 days.
Diseases covered	Compensation for direct losses under the Animal Health Fund is covered by the government-industry agreement for the following diseases: avian influenza, African swine fever, classical swine fever, Q fever, bluetongue, bovine spongiform encephalopathy (BSE), bovine tuberculosis, brucellosis, foot-and-mouth disease, Newcastle disease, scrapie, brucella melitensis, swine vesicular disease, and bovine leucosis.
Differentiated treatment of diseases	The scheme's compensation procedures do not change for different types of livestock diseases (e.g. zoonoses and diseases only affecting animal production). However, there is differentiation between disease types in the sense that the Product Boards are liable for different contribution ceilings based on the various relevant species/diseases. The manner in which the contribution ceilings function makes it difficult to determine if the government attempts to assume, for example, a larger share of the costs for zoonotic disease control.
Financial structure	
Funding sources and mechanisms	Negotiations held every five years between the Ministry and the three Product Boards determine the livestock industry's contribution ceilings in the event of an outbreak, which vary by sector and disease. In the event of an outbreak the government initially covers compensation and disease control costs before invoicing the relevant Product Board up to its contribution ceiling. The Product Boards raise funds through levies paid by livestock holders. After an outbreak, the levies on the affected sector are increased – assuming the relevant Product Board's reserves were insufficient – in order to meet the sector's financial responsibility to the Animal Health Fund. When an epidemic's cost exceeds the applicable contribution ceiling the government pays the additional costs and is partially reimbursed by European Union co-financing. 'Peace-time' disease monitoring and structural costs are shared on a 50/50 basis between the sector and the government.
Cost-sharing	Cost-sharing is arguably both <i>ex ante</i> (because of the continuous nature of the levies and the sharing of "peace-time" disease monitoring and structural costs) and <i>ex post</i> in nature, but the <i>ex post</i> aspect is more significant in monetary terms because the majority of industry contributions to an epidemic's control costs will be raised after the outbreak through increased levies.
Practical experience	
Incentives provided (for prevention/biosecurity practices and early notification)	The Ministry reports that the scheme adds to the overall awareness of livestock holders' animal health responsibilities (but does not claim that the scheme has prevented disease outbreaks) and, arguably, the reduced, 50% compensation for visibly sick animals and 0% compensation for animals dead at the time of inspection incentivise early notification.
Efforts to mitigate potentially adverse incentives	Overcompensation is guarded against by only compensating the market value of holders' losses. Ongoing work on development of a compensation scheme for consequential losses seeks to nullify potentially adverse incentives linked to restriction zones and vaccination programmes by ensuring that no financial disparity arises between either restricted and culled farms or vaccinated and culled farms. Plus, the Animal Health Fund largely avoids the issue of moral hazard through the contribution ceilings – only for an epidemic whose cost substantially exceeded a contribution ceiling would moral hazard be an issue (since in other cases ultimate financial responsibility rests with the private sector).

Notes

1. Prior to restructuring in October 2010, it was the Ministry of Agriculture, Nature and Food Quality (LNV) which worked to develop a consequential losses compensation scheme and administered the Animal Health Fund.
2. The 2011 report on the Netherlands' agricultural risk management practices written for the OECD by O. Melyukhina lists a mutual insurance product – Porcopol – covering consequential losses from swine epidemics and identifies its penetration rate in 2008 as 6.5% of the total number of sows. Similarly, van Asseldonk *et al.* (2006) describe a consequential losses insurance product for cattle with less than 10% participation. Lastly, the World Bank 2006 report states that "...farmer participation [in private insurance schemes] is less than 10%".
3. As noted above, this former Ministry is now part of the Ministry of Economic Affairs, Agriculture and Innovation.
4. This means that if, for example, one week passes between the suspicion of a disease and the decision to initiate control measures, the latter date becomes the relevant one for consideration of market value.
5. As the OECD has noted, "...the moment premiums are to be paid influences farmers' risk awareness and incentives for risk prevention." It is thought that a mix of *ex ante* and additional payments (or levies) to one scheme will likely produce the strongest preventive effect (Melyukhina, 2011, p. 57). As shown above, this is almost precisely the levy system employed by the three Product Boards participating in the Animal Health Fund, so supporting the Ministry's contention that the scheme has increased animal health awareness on the part of livestock holders.
6. As reported by an official from the Dutch Ministry of Economic Affairs, Agriculture and Innovation, the widespread use of culling in response to CSF in 1997/98 and FMD in 2001 increased societal resistance to stamping-out (i.e. potentially large-scale culling) as a disease control mechanism (see also Melyukhina, 2011, p. 52). The increased use of emergency vaccination in relation to culling – in applicable outbreaks – also appears to be a general trend in animal disease control.

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Chapter 11.

Viet Nam

This chapter describes important features of the animal disease management system in Viet Nam. The first section focuses on prevention and control systems and covers the assessment of risks, the consultation and decision-making process, the design and implementation of animal health programmes, and the management of outbreaks. The second section analyses compensation schemes and the system of incentives, including institutions, compensation practices, financial structures, and incentives for notification and prevention. The concluding table summarises the main characteristics and challenges.

The total land area of Viet Nam is 329 566 km². Among the total population of just over 86 million people, 80% are involved in agriculture. The sector accounted for 20.6% of Viet Nam's gross domestic product (GDP) in 2010, with livestock comprising 24.5% of total agricultural GDP. According to OIE data, the total populations of buffalo, cattle, pig, and birds in Viet Nam are 2.9 million, 5.9 million, 2.7 million, and 218 million, respectively.

Recently, three outbreaks of major epidemic livestock diseases were notified to the OIE: avian influenza, foot-and-mouth disease, and Porcine Reproductive and Respiratory Syndrome (PRRS). Due to avian influenza, a total of over 49 million birds were culled between 2003 and 2010. In 2010, 36 272 birds were culled as a result of avian influenza, 371 animals were culled due to foot-and-mouth disease (FMD), and 77 158 pigs were culled in response to PRRS. When an outbreak occurs, the central government regulates the compensation scheme with a circular issued by a decision of the prime minister upon the request of the Ministry of Finance in collaboration with the Ministry of Agriculture and Rural Development. Provincial departments of finance are charged with management of compensation funds within their respective provinces.

11.1 Compensation schemes and incentives

Institutional framework

In Viet Nam, the National Prevention/Emergency Fund has been established to control and prevent risks such as natural damage, epidemic livestock disease, and human disease outbreaks. The first highly pathogenic avian influenza (HPAI) outbreak occurred in December 2003, while the first PRRS outbreak occurred in March 2007. After three years, in March 2010, PRRS reappeared. These outbreaks pose a threat to Viet Nam in two important areas: public health due to the zoonotic nature of avian influenza; and production, given the importance of the poultry and livestock sectors to the domestic economy. In addition, the outbreaks decreased the poverty reduction potential of small-scale poultry and livestock production for rural smallholders.

Aiming to control and eradicate these outbreaks, the Government of Viet Nam established emergency support policies. Following the initial relevant government decisions in 2004 and 2005, several decisions on compensation were approved – No. 132/2007/QD-TTG (15 August 2007), No. 1037/QD-TTG (15 August 2007), No. 738/QD-TTG (18 May 2006), No. 719/QD-TTG (5 June 2008), No. 80/2008/TT-BTC (18 September 2008), No. 142/2009/QD-TTG (31 December 2009), and, most recently, No. 1442/QD-TTG (23 August 2011). The resulting policies aim at preventing the public health threat inherent in avian influenza, as well as reducing the national economic losses associated with outbreaks of avian influenza, FMD, and PRRS. The policy rationale is to encourage farmers to declare disease outbreaks at an early stage in order that the disease can be contained among the livestock population. A key component of the support policy is a compensation level that encourages farmers to cull animals rather than sell them illegally on the market.

There is an ongoing discussion between the central government and livestock producers with regard to adequate risk-sharing patterns. These patterns, and therefore the discussions, are closely linked to the restructuring of the poultry production sector in Viet Nam. The Ministry of Agriculture and Rural Development (MARD) is the government agency participating in these negotiations. It is also responsible for designing the control and prevention programmes in the event of a livestock disease outbreak.

The National Committee for Disease Control and Prevention advises the Government of Viet Nam on the support policies, as well as disease control and prevention strategies. The funding of control and prevention efforts, including financial support for outbreak containment and the payment of direct compensation, restocking subsidies, and other

expenses to those affected by culling, has been achieved in part through the aforementioned National Prevention/Emergency Fund, as well as provincial Prevention/Emergency budgets.

Livestock holders' responsibilities in the event of an epidemic disease outbreak include timely declaration of the disease's presence and strict implementation of the control and prevention programmes recommended by the government. Compliance with control and prevention programmes implies adherence to government containment regulations such as bans on moving or selling disease-susceptible animals.

Compensation practices

Only livestock holders' direct losses are covered under the compensation scheme, which currently covers avian influenza, FMD and PRRS; the scheme does not differentiate its procedures between these different types of diseases. Following the recommendation of a study on compensation and associated financial support for farmers, the government's compensation rate for birds culled during stamping-out procedures was raised from 10-15% of the market value of the destroyed/slaughtered livestock in 2004, to 50% in June 2005, and 70% in June 2008. Market value is assessed on the basis of cost per kilogram. Increasing the compensation level has reportedly led to greater livestock holder satisfaction with the scheme. Notably, compensation policy differs between private poultry producers and State-Owned Enterprises (decisions No. 719/QD-TTg, No. 142/2009/QD-TTG and No. 1442/QD-TTG).

In terms of its procedures, the compensation scheme does not distinguish between "limited" and "catastrophic" disease outbreaks. The main central government guidelines that prescribe compensation payments to private livestock producers were updated in August 2011 to the following:

- Direct indemnification of animals ordered culled at the rates: USD 1.75 per head for poultry (previously USD 1.15); USD 1.90 per live weight kilogram for pigs (previously USD 1.25); and USD 2.25 per live weight kilogram for cattle (previously USD 1.50);
- Other direct expenditures:
 - Since 2008, staff for vaccination has been financed by the central government budget at a rate of USD 0.005 for poultry; USD 0.05 per head of pig; and USD 0.1 per head of cattle. These rates also increased on 23 August 2011.
 - The maximum subsidy for an official to cull an animal had – since 2008 – been USD 2.50 per working day and USD 5 per holiday. This amount also increased in August 2011.

State-owned enterprises receive compensation in a different form. These enterprises receive from the central government the total amount of funds needed to feed the foundation stock, to restock, and to ensure proper veterinary/sanitary services, including disinfections, labour costs, and equipment. The funds are first given to the sub-departments of animal health at the provincial level for veterinary activities, and a second allocation is made to farms based on their needs, with a part of the fund specifically allocated for disinfection. Stakeholders reported no recent cases in which the government has resorted to *ad hoc* payments, i.e. payments unrelated to the public compensation scheme, in order to indemnify livestock holders for losses incurred as a result of disease outbreaks.

At the provincial and district levels, the Committees for Epidemic Disease Control and Prevention comprise representatives of the sub-departments of Agriculture, Health, Animal Health, Finance, Trade, Police, Transport, Natural Resources and Environment, and Culture and Information. At commune and village level, the commune disease control committees supervise the control of animal movement, culling, and disposal. The commune committees

consist of a commune leader, a lawyer, an animal health worker, a sample of affected farmers, and a police officer, as well as other personnel.

Evaluation of losses is done at the local level. When an outbreak occurs, farmers should inform the head of the village. In turn, the head of the village should report to the communal committee disease control and prevention. In turn, the communal committee informs the Committees for Epidemic Disease Control and Prevention at the provincial and district levels. These committees visit livestock holdings and carry out tests to confirm the disease infection of the stock. If the disease test result is positive, all of the poultry and livestock in the infected area are culled. A culling document/appraisal form, which includes information on the date the livestock owner reports the disease, the date of detection of the disease by an inspector, the date of culling, and the number of poultry and livestock culled, is then composed and signed by farmers and the other stakeholders. Compensation to farmers is subsequently based on this document, and is paid through the commune institution. The financial procedure is as follows: funds from the central government are allocated to the provincial financial department, which then allocates the central government funds, together with the provincial funds, to the district financial department. This district-level body then allocates the total compensation payment to the communes, which in turn distribute the money to farmers in accordance with the previously specified number of animals culled. All compensation payments are made in cash.

Financial structures

The National Prevention/Emergency Fund, which is generated through national taxes, is used in the case of national emergencies. The main principles guiding compensation for poultry and livestock producers affected by culling used as a response to avian influenza, FMD, and PRRS are the following (Decision No. 719/QD-TTg, and No. 1442/QD-TTg):

- The government contributes between 60% and 80% of the costs for controlling outbreaks of the diseases. The remaining amount is contributed from the provincial Prevention/Emergency budgets.
- Ha Noi and Ho Chi Minh City do not receive any contribution from the central government; their outbreak control funds will come from their local Prevention/Emergency budgets.
- In cities and provinces where the financial contribution towards avian influenza, FMD, and PRRS outbreak control exceeds 50% of the local Prevention/Emergency budget, the central government contributes the remainder from the National Prevention/Emergency Fund.
- In cities and provinces where the cost of controlling the diseases is lower than USD 50 000, the local Prevention/Emergency budgets covers all of the costs.

In the case of avian influenza, the Viet Nam Government reacted with considerable effort to contain the outbreak once the scope and ferocity of the epidemic became apparent. The government established a multi-ministerial avian influenza steering committee (AIST), chaired by MARD, and comprising representatives of the ministries of Agriculture and Rural Development, Health, Finance, and Planning and Investment, as well as other departments. A national action plan for the control of avian influenza was drafted to provide guidelines for containing the epidemic. The Viet Nam Integrated National Operational Programme for Avian and Human Influenza (OPI) was also established. The Programme was to be implemented by the avian influenza working group, comprising the various technical animal husbandry and animal health institutes.

Since late 2005, there has been increasing concern from both the Government of Viet Nam and international partners on the dangerous status of avian and human influenza in Viet Nam. The Government of Viet Nam and donors showed their strong commitment for financing the implementation of the OPI during the period 2006 to 2010. Commitment levels (as of October 2008) from the government and international donors for implementation of the OPI were estimated at USD 202 million, almost triple what had been committed during 2004 to 2005 (USD 77.7 million). The commitments were financed at 35% by the Government of Viet Nam, with the rest from official development assistance (ODA). It was hoped to finance the OPI such that it would be possible to undertake necessary risk management actions set out in the Green Book in different various agriculture and health sectors. Proposals originated with MARD and Ministry of Health (MOH) during dialogue processes with the international donor community.

International donors applied various funding modalities, including bilateral aid, and even committed to in-kind contributions, including transfers of expertise, equipment, and chemicals for laboratories and tests. The World Bank applied a global multi-donor financing mechanism, and also proposed a credit line. Several donors channelled support through the UN System for a Government of Viet Nam-United Nations Joint Programme. The resulting commitment levels (in December 2009) from the Government of Viet Nam and international donors for implementation of the three components of the OPI are shown in Table 11.1.

In Table 11.1, the third column shows Green Book cost estimates; the fourth column reflects financial commitments from both the Government of Viet Nam (GoV) and international donors during discussion and negotiation processes, with co-ordination support from the PAHI Secretariat; the fifth column consists of consolidated figures for project budget designs which are related to the OPI; and the sixth column provides a consolidated view of real disbursements made under these projects. During these years, the Government of Viet Nam financed more than USD 85.7 million, 23% higher than its original commitment for the whole period 2006 to 2010. In order to respond to the emergency situation at both central and provincial levels, the government drew these funds from its annual contingency budget lines for Strengthening Surveillance and Response and Strengthening Curative Medicine System (H1N1, health sector) and Disease Control (H5N1, agriculture sector).

In the same period (2006-2010), which constituted approximately two-thirds of the total expected implementation timeframe for the Green Book, international donors delivered a little less than half (41%) of their commitments. The difference between commitment and delivery can be explained by three factors: (i) key projects were ongoing until the end of 2010; (ii) some of the larger projects encountered delays leading to a low rate of disbursement; and (iii) some new projects commenced toward the end of the period with committed funds but no expenditures.

For the period 2011 to 2012, a proposal by the central government has estimated a budget for the control and eradication of avian influenza of USD 15.5 million. It is foreseen that the National Prevention/Emergency Fund will finance about USD 8.8 million of this total. The remaining portion will be fund by the provincial Prevention/Emergency budgets (Decision No. 305/QD-BNN-TY, 25 February 2011).

In the case of FMD, the prime minister signed on 27 December 2005 decision No. 3660/QD-BNN-TY to allocate a budget for prevention and control of USD 26.4 million for 2006 to 2010. In this case, the budget of the National Prevention/Emergency Fund financed USD 12.4 million, and the remaining amount was paid by the provincial Prevention/Emergency budgets. At the end of the programme, the actual expenditure of the National Prevention/Emergency Fund was USD 10.5 million. For the 2010 to 2015 period, the central government planned to provide a budget for the control of FMD of USD 33.4 million (decision No. 975/QD-BNN-TY, 16 May 2011). For this budget, the National

Prevention/Emergency Fund will finance about USD 15.5 million. Again, the remaining cost will be funded by the provincial Prevention/Emergency budgets.

Table 11.1. Viet Nam Integrated National Operational Programme for Avian and Human Influenza (OPI) data, as of December 2009 (USD)

OPI Code	Green Book component	Green Book cost estimate	Budget as pledged commitment	Budget as actual commitment in projects	Actual expenditure as of Dec 2009
I.	Enhanced Coordination Activities	31 220 000	24 951 700	16 404 156	9 244 929
I.A	National Preparedness	602 000	646 300	2 324 609	1 159 657
I.B	Policy and Strategy Development	137 000	219 000	319 500	164 114
I.C	Programme Coordination and Management	5 798 000	4 352 300	3 363 300	2 138 638
I.D	Public Awareness & Information Sharing	4 366 000	11 966 300	7 987 147	4 425 263
I.E	Programme M & E	2 010 000	1 733 000	334 183	142 585
I.F	Support Regional Coordination / International Agencies	18 307 000	6 034 800	2 075 417	1 214 672
II.	H5N1 Control and Eradication in the Agricultural Sector*	116 421 000	65 127 000	46 518 657	46 444 907
II.A	Strengthening Veterinary Services	17 822 000	7 712 200	3 349 700	4 409 905
II.B	Disease Control	84 481 000	48 070 900	35 922 243	37 919 412
II.C	Surveillance and Epidemiological Investigation	4 771 000	6 350 100	5 484 950	3 116 950
II.D	Poultry Sector Restructuring	9 347 000	2 993 800	1 761 764	998 640
III.	H5N1 Prevention and Pandemic Preparedness in the Health Sector**	102 407 000	85 687 200	159 798 528	84 505 739
III.A	Strengthening Surveillance and Response	40 810 000	39 721 100	66 624 480	21 988 567
III.B	Strengthening Diagnostic Capacity	15 486 000	7 388 600	33 660 148	24 048 610
III.C	Strengthening Curative Medicine System	36 200 000	31 526 000	57 868 100	37 054 467
III.D	Improving Research	9 911 000	7 051 500	1 645 800	1 414 094
	Total Allocated Fund	250 048 000	175 765 900	222 721 341	140 195 575
	Adjustment: GoV co-financing for ODA projects		3 000 000		
	Adjustment: funding gap against planned project budget		870 100		
	Adjustment: committed funds without detailed allocation		26 786 900		
	Revised Total	250 048 000	206 422 900	222 721 341	140 195 575

* GoV disbursement is based on MARD report 86/TY-TC 14 January 2010 and cross-checked with MOF report 1406/BTC-HCSN 1 February 2010.

** GoV disbursement is based on MOH report 67/BYT-KHTC 6 January 2010 and cross-checked with MOF report 1406/BTC-HCSN 1 February 2010.

Source: Tran Nam Binh, Mid-Term Review: Viet Nam Integrated National Operational Programme for Avian and Human Influenza (OPI) 2006-2010.

The key aspects of the central government's emergency policy guidelines on epidemic livestock diseases and associated fund/subsidy allocation can be grouped into two categories: (i) funding for poultry and livestock producers (i.e. households, farmers, co-operatives, etc.); and (ii) funding for State-Owned Enterprises (SOEs). Compensation funding from the National Prevention/Emergency Fund for poultry and livestock producers is dependent on the budget department of the Ministry of Finance, while compensation for SOEs depends on the Department of National Enterprises of the Ministry.

The allocation of funds in the provinces follows a different pattern. It is characterised by the provincial and district financial departments' control of resources. Thus, in almost all provinces, the provincial finance department allocates funds to the district financial department, which in turn distributes the compensation payments to farmers in accordance with the number of animals culled.

The compensation scheme clearly does not entail a public-private cost-sharing arrangement (involving contributions from livestock holders). Private insurance for such risks has not yet been introduced in Viet Nam, though a new pilot project on insurance has recently been started.

Outbreaks and practical experiences

Problems in compensation scheme management in Viet Nam arise from the establishment of different categories and especially different compensation rates between provinces. For instance, farmers try to move and cull their poultry in neighbouring provinces with higher support levels and compensation rates. In sum, differing compensation rates and categories between provinces encourages animal movement, thereby enhancing disease spread and hindering disease containment. The rationale behind compensating farmers is to increase compliance with regard to animal culling. It is therefore crucial in the containment of an avian influenza outbreak. If farmers were not compensated because they own only a small number of poultry, there would be an incentive for them to sell potentially infected animals on the market, thus contributing to the spread of the disease. Furthermore, late payment and/or compensation rates seen as insufficient by farmers could encourage illegal movement or selling of animals, as well as non-reporting, aimed at the minimisation of losses. Any of these actions would impede rapid containment of the outbreak.

The Ministry of Agriculture and Rural Development has insisted that the compensation rate be increased in order to constitute an incentive for improving outbreak notification by farmers. However, in Viet Nam, the activity of paying farmers for their losses that result from disease outbreaks (referred to as "compensation" by the OIE and FAO) is often interpreted and understood as financial support, because the central government does not collect any fees/tax from livestock owners, and yet provides them with funds.

The compensation scheme has not had a great effect on the behaviour of livestock holders in terms of encouraging better prevention/biosecurity practices and early notification for three reasons: i) the rate is low; ii) the speed of disbursement is slow; and iii) there are heavy bureaucratic administrative procedures. Nonetheless, interviewees reported that to some extent the scheme has generally contributed to decreasing the risk of outbreaks of epidemic livestock diseases, their cost, and the pressure for governments to provide *ad hoc* compensation. The scheme reportedly encourages early reporting and incentives to take preventive measures on the farm. Producers may thus be more willing to declare the disease at an early stage and cull their animals, reducing animal movement and illegal selling. Following this rationale, an outbreak is expected to be contained at a much earlier stage, thereby reducing direct and indirect costs and losses.

Table 11.2. Recent major outbreaks that prompted compensation payments

Disease	Time period	Scope of outbreak and compensation	Potentially associated modifications to scheme (if any)
Foot-and-mouth disease (FMD)	2002-2010	Foot-and-mouth disease has been a persistent presence in Viet Nam during the past decade. In terms of the number of animals destroyed or slaughtered in response to outbreaks, most years have seen less than 400 instances, but 2006 (4 361 destructions/slaughterings), 2007 (4 480), and 2009 (844) were more severe in this regard.	Compensation/support policies for FMD was approved by government decision (No 738/QD-TTg) and a government circular (No 44/2006/TT-BC) in 2006.
Highly pathogenic avian influenza (HPAI)	2003-2010	Culling of animals susceptible to HPAI has occurred every year since an outbreak in December 2003. The 2004/05 period was particularly severe, with just under 45 million birds destroyed in 2004 and nearly 4 million destroyed in 2005.	The government decision on compensation for avian influenza was approved in April 2004. The percentage of market value indemnified was raised from 10-15% to 50% in June 2005 and to 70% in June 2008.
Porcine Reproductive and Respiratory Syndrome (PRRS)	2007-2010	The initial outbreak occurred in March 2007, and that year 4 425 pigs were destroyed or slaughtered. The year 2008 was more severe – there were 277 602 cases and 52 164 pigs were destroyed or slaughtered. Also, 2010 is notable as over 77 000 pigs were destroyed or slaughtered (there were a total of 112 137 cases).	n.a.

Source: OIE HandiSTATUS Interface (2011); OIE WAHID Interface (2011).

11.2 Concluding remarks

The main features of Viet Nam's compensation scheme are highlighted in Table 11.3.

Table 11.3. Key features of Viet Nam's compensation scheme

Name of scheme	Emergency support policies, including compensation, for disease prevention and control
Legal basis	Based on series of government decisions dating from 2004; the most recent is Government Decision No. 1442/QD-TTg (August 2011)
Institutional framework	
Scheme governance	Central government regulates the scheme through decisions of the prime minister upon request of the Ministry of Finance and in collaboration with the Ministry of Agriculture and Rural Development. Provincial finance departments manage funds within their respective provinces. Committees for disease control and prevention at provincial and district levels work with commune committees to confirm disease presence and develop culling documents/appraisal forms which serve as the basis for compensation payments.
Main stakeholders	Central government (Ministry of Finance, Ministry of Agriculture and Rural Development); Provincial departments of finance Provincial and district committees for disease control and prevention Commune committees (include some affected farmers) State-owned enterprises (different compensation procedures)
Is private insurance coverage available?	Private insurance for such risks is not yet available, though a pilot project on insurance recently began.
Compensation	
Overview of the scope of compensation	A percentage (currently 70%) of the market value of culled animals is payable to livestock owners. Per-animal or per-day subsidies are also provided to officials who vaccinate or cull animals.

Table 11.3. Key features of Viet Nam's compensation scheme (*continued*)

Are consequential losses covered?	Only direct losses (portion of the market value of culled animals) are eligible for compensation.	
Stakeholders' eligibility for compensation	Livestock owners	Direct losses resulting from the culling of animals.
	Smallholders	Decisions on eligibility have varied. For example, whereas Ha Tay Province once decided to compensate all farmers, Ho Chi Minh and Tien Giang required poultry producers to have more than 100 and 50 animals, respectively.
	Officials	Per-animal or per-day subsidies are payable to officials who vaccinate or cull animals.
Rules for valuation	Compensation now pays 70% of market value (prior to the outbreak) of culled animals, which is assessed on the basis of cost per kilogram. Central government sets homogenous rates (e.g. per head of poultry), but provinces divide animals into different categories such that compensation amounts differ.	
Conditionality	Violating regulations on early notification can nullify compensation. Livestock holders must declare a disease at an early stage and comply with government containment regulations, including susceptible animal movement/selling restrictions. Payment is conditional on the health of the animals in order to encourage early reporting. Animals that die prior to official culling approval not indemnified.	
Timeframe for compensation	Disbursement of the compensation payments can be "slow" according to interviewees.	
Diseases covered	Avian influenza, foot-and-mouth disease, and porcine reproductive and respiratory syndrome	
Differentiated treatment of diseases	The compensation scheme does not differentiate between the three diseases.	
Funding sources and mechanisms	Guiding financial principles include: 1) The central government contributes 60% to 80% of disease control costs (through the National Prevention/ Emergency Fund), with the rest financed by provincial Prevention/ Emergency budgets; 2) Ha Noi and Ho Chi Minh City do not receive central government contributions; 3) When provincial shares of control costs exceed 50% of the local Prevention/ Emergency budget, the central government pays remainder of costs; 4) In provinces where costs are below USD 50 000, they are paid from the local Prevention/ Emergency budget.	
Cost-sharing	The compensation scheme is publicly funded; however, in most provinces compensation costs are divided between the central government and the provincial Prevention/Emergency budget.	
Practical experience		
Incentives provided (for prevention/biosecurity practices and early notification)	Payment is conditional on the health of the animals in order to encourage early reporting. Animals that die prior to official culling approval are not indemnified. In terms of encouraging better prevention/biosecurity practices and early notification the compensation scheme has not had a great effect on the behaviour of livestock holders for three reasons: i) the rate is low; ii) the speed of disbursement is slow; and iii) there are heavy bureaucratic administrative procedures.	
Efforts to mitigate potentially adverse incentives	The compensation level of 70% of market value ensures that livestock holders will bear a portion of any direct losses resulting from an outbreak (as well, of course, as the full burden of consequential losses). Also, the compensation rate has been raised from 10-15% of the market value of the destroyed/slaughtered livestock in 2004, to 50% in June 2005, to 70% in June 2008. These increases have likely helped decrease issues associated with under compensation.	

Glossary¹

Animal health status: The status of a country or a zone with respect to an animal disease, according to the criteria listed in the relevant chapter of the Terrestrial Code dealing with the disease.

Animal identification: The combination of the identification and registration of an animal individually, with a unique identifier, or collectively by its epidemiological unit or group, with a unique group identifier.

Animal identification system: The inclusion and linking of components such as identification of establishments/owners, the person(s) responsible for the animal(s), movements and other records with animal identification.

Biosecurity plan: A plan that identifies potential pathways for the introduction and spread of disease in a zone or compartment, and describes the measures which are being or will be applied to mitigate the disease risks, if applicable, in accordance with the recommendations in the Terrestrial Code.

Competent Authority: The Veterinary Authority or other Governmental Authority of a Member having the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification and other standards and recommendations in the Terrestrial Code and in the OIE Aquatic Animal Health Code in the whole territory.

Consequential losses: Losses other than direct material losses such as animal deaths and reduced yields. These losses can stem from business interruptions; movement restriction zones (i.e. animals cannot be moved from the property; in these cases, “welfare” slaughter can be carried out); repopulation costs in excess of animal costs; emergency vaccination campaigns (because the product derived from vaccinated animals are worth less); or general price declines.

Disease: The clinical and/or pathological manifestation of infection.

Emerging disease: A new infection resulting from the evolution or change of an existing pathogenic agent, a known infection spreading to a new geographic area or population, or a previously unrecognised pathogenic agent or disease diagnosed for the first time and which has a significant impact on animal or public health.

Eradication: The elimination of a pathogenic agent from a country or zone.

Free zone: A zone in which the absence of the disease under consideration has been demonstrated by the requirements specified in the Terrestrial Code for free status being met. Within the zone and at its borders, appropriate official veterinary control is effectively applied for animals and animal products, and their transportation.

Notifiable disease: A disease listed by the Veterinary Authority, and that, as soon as detected or suspected, should be brought to the attention of that Authority, in accordance with national regulations.

1. Extracts from OIE Code.

Notification: The procedure by which:

- the Veterinary Authority informs the Headquarters,
- the Headquarters inform the Veterinary Authority, of the occurrence of an outbreak of disease or infection, according to the provisions of Chapter 1.1 of the Terrestrial Code.

Official Veterinarian: A veterinarian authorised by the Veterinary Authority of the country to perform certain designated official tasks associated with animal health and/or public health and inspections of commodities and, when appropriate, to certify in conformity with the provisions of Chapters 5.1 and 5.2 of the Terrestrial Code.

Outbreak: The occurrence of one or more cases in an epidemiological unit.

Quarantine station: An establishment under the control of the Veterinary Authority where animals are maintained in isolation with no direct or indirect contact with other animals, to ensure that there is no transmission of specified pathogen(s) outside the establishment while the animals are undergoing observation for a specified length of time and, if appropriate, testing and treatment.

Risk analysis: The process composed of hazard identification, risk assessment, risk management and risk communication.

Risk assessment: The evaluation of the likelihood and the biological and economic consequences of entry, establishment and spread of a hazard within the territory of an importing country.

Risk management: The process of identifying, selecting and implementing measures that can be applied to reduce the level of risk.

Sanitary measure: A measure, such as those described in various chapters of the Terrestrial Code, destined to protect animal or human health or life within the territory of the OIE Member from risks arising from the entry, establishment and/or spread of a hazard.

Terrestrial Code: The OIE Terrestrial Animal Health Code.

Veterinarian: A person registered or licensed by the relevant veterinary statutory body of a country to practice veterinary medicine/science in that country.

Veterinary Services: The governmental and non-governmental organisations that implement animal health and welfare measures and other standards and recommendations in the Terrestrial Code and the OIE Aquatic Animal Health Code in the territory. The Veterinary Services are under the overall control and direction of the Veterinary Authority. Private sector organisations, veterinarians, veterinary paraprofessionals or aquatic animal health professionals are normally accredited or approved by the Veterinary Authority to deliver the delegated functions.

Zoonosis: Any disease or infection which is naturally transmissible from animals to humans.

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Livestock Diseases

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