The involvement of the agriculture industry and government in animal disease emergencies and the funding of compensation in Western Europe

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Summary

In Western Europe, the control and eradication of contagious animal diseases have always been subject to government legislation. In the event of an outbreak, the principal policy is ' stamping-out ' (depopulation) of the infected herd. The owner of the herd is usually awarded financial compensation. The authors provide an overview of the involvement of the agriculture industry and government in animal disease emergencies and the funding of compensation in Western Europe. In particular, developments within the European Union are described, as illustrated by a case study in the Netherlands. The economic consequences of a widespread epidemic of classical swine fever (hog cholera) in the Netherlands in 1997 are described. Evaluation of the epidemic demonstrated that special emphasis needs to be placed on factors such as the high-risk period, animal movement, the attitude of farmers towards risk and the structure of compensation. Epidemic disease insurance schemes are considered to be a possible alternative in alleviating certain financial losses caused by disease outbreaks.

Keywords


Introduction

During the 18th and 19th Centuries, in most of the countries of Western Europe, legislation was established to control contagious animal diseases, such as rinderpest and bovine pleuropneumonia. Financial compensation was often paid to the owners of cattle which had to be slaughtered. This compensation was provided by regional authorities, with reimbursements set at various levels, or by agricultural funds.

In the 20th Century, particularly after World War II, increasing agricultural production and improved economic circumstances led to specialisation among the countries of Western Europe. Trade among countries solved problems of both over- and under-supply. In this respect, the establishment of the European Economic Community (EEC) in 1956 was a logical step. One of the aims of the EEC was to establish a common market among countries for employment, goods and capital. In 1986, a definite time frame was established to achieve this common market by 1993. This schedule also took into account control and eradication policies on contagious animal diseases. From the early 1980s, EEC legislation was developed for the control and eradication of highly contagious animal diseases, such as classical swine fever (CSF) (hog cholera), foot and mouth disease (FMD) and Newcastle disease (ND). The main policy
was ‘stamping-out’ (depopulation) of infected herds with financial compensation for the owner of the herd. From the very beginning, provision for financial contributions from the EEC was included in the legislation.

The twelve countries which formed the Common Market in 1993 all had quite different animal disease situations. However, it was decided to set high standards and to follow a strategy of non-vaccination for most highly contagious animal diseases.

In this paper, the authors focus on the structure and funding of compensation for animal disease emergencies within the European Union (EU). Moreover, a recent epidemic of CSF in the Netherlands, which led to a reconsideration of the funding system, is examined as a case study.

Reactions to outbreaks of classical swine fever

Outbreaks of contagious animal diseases lead to different reactions on different continents. A good case study is provided by CSF. Outbreaks of this disease are of economic significance in many countries of Asia, South America and Europe. Most affected countries in Asia and South America rely on vaccination to reduce losses caused by the disease. A policy of vaccination is also followed as an adjunct to CSF control in some countries of Eastern Europe.

Within the EU, the measures applied to prevent, control and eradicate CSF have been harmonised by EU legislation. Thus, the same measures are applicable in all EU countries. In the case of a CSF outbreak in any EU Member State, an established series of measures must be followed to eradicate the disease as soon as possible. Minimum measures include stamping-out of infected herds and the establishment of movement restriction zones (so-called 'surveillance and protection zones') around the affected premises. The same measures apply to other diseases, such as FMD and African swine fever (ASF). Countries are allowed to apply stricter measures if deemed necessary. Such additional measures may include, for example, larger movement restriction zones and the pre-emptive slaughter of herds within a certain radius of an affected herd.

The CSF control strategy is based on the so-called 'non-vaccination policy' (as is also the case for the FMD control strategy). This means that, in normal circumstances, vaccination is not permitted. It can be used only in particular cases, and as an adjunct to other control measures. Only in the case of an emergency, when the outbreak situation threatens to go beyond control, may a country apply to the EU Commission for approval to vaccinate. The EU Commission then seeks advice from the Standing Veterinary Committee, which comprises veterinary experts from all Member States (3).

Losses caused by epidemics

Losses incurred by epidemics of contagious livestock diseases can be divided into various categories. An intuitive distinction can be made between costs and losses. For example, 'losses' may be incurred because of a lack of income on depopulated farms, and 'costs' may be incurred in the course of the organisation and execution of the eradication campaign. In this paper, losses and costs are included together as 'total losses'. These can be divided into direct losses and indirect losses.

Total direct losses are the costs and losses incurred by eradication measures, as follows:

a) the costs of compensation for animals which have been destroyed as a result of the following measures:
   - compulsory slaughter on affected farms and of traced contact herds
   - pre-emptive slaughter of herds on farms neighbouring the affected farm
   - welfare slaughter (or market support), that is, slaughter of animals within the movement restriction areas to avoid welfare problems due to housing limitations
b) the costs of compensation for animals which are prohibited from breeding
c) consequential losses to farmers, among others, caused by loss of production on farms which have been depopulated and are located in a movement restriction zone
d) consequential losses to related industries (such as abattoirs, transportation, artificial insemination, feed mills)
e) organisational costs.

Indirect losses are what may be termed 'long-term' losses. These losses are due to market disruptions. Such disruptions might be caused by a temporary over- or under-supply of animals or animal products, due to the destruction of animals and movement restrictions within the affected zones. More serious epidemics in exporting countries may lead to their export markets being taken over by competitors. Such take-overs may be temporary. If not, the economic consequences of these indirect costs may well outweigh the direct losses caused by the epidemic (1).

Compensation

Some costs incurred by the governments of EU Member States when applying the prescribed eradication measures are
partially refunded by the EU. After inspection of the measures applied and expenditure incurred in the affected countries, the EU may reimburse 50% of these costs. Relevant costs include the following:

- the costs of depopulation
- the costs of disposal of the carcasses and other materials which may be contaminated (feed, equipment, etc.)
- the costs of cleaning and disinfecting the affected premises.

In the case of an approved emergency vaccination programme, the EU also provides funding for vaccines and vaccination campaigns.

The above framework applies to most diseases notifiable to the EU, but not to FMD, for example. Until 1998, costs incurred in FMD eradication were reimbursed at 70%. After 1998, this decreased to 60% (3).

This EU compensation is indirectly funded by EU Member States, by means of the annual agricultural levy.

Farmers whose farms are affected by the disease usually receive compensation for animals which have been destroyed. The compensation strategy varies among countries. The aim is to compensate for 100% of the actual market value of the animals. In general, there are two ways to determine the value of the animals for compensation. Either an official appraiser estimates the value of the animals, or the animals are weighed and payment is made per kilogram. Compensation is based on the market price. In some countries, there might be a fixed price per category of animals for a short period of time (such as a week or month). Adjustments take place after each of these periods, in relation to the average market price over that period. In most countries, extra compensation is paid for high-pedigree breeding animals.

Case study: the Netherlands

The funding and compensation system in the Netherlands until 1997

In the Netherlands, regional agricultural funds were established in 1840. Farmers paid a levy to these funds, proportional to the number of cattle they owned. From these agricultural funds, compensation could be paid for damage sustained by herds in various disasters. After 1850, public financial resources also became available for the purpose of compensation. For many years, compensation following outbreaks of disease was subject to negotiations between the Government and the livestock industry.

After the experiences of and the expenditure incurred in the CSF epidemic of 1982-1985 (direct losses totalled US$30-35 million), the Government and livestock industry developed and established a more structured national stamping-out fund. This fund became operational in 1988 and was used to cover the direct costs (compensation, cleaning and disinfection, etc.) incurred in the eradication of outbreaks of diseases such as ASF, CSF, FMD, swine vesicular disease and ND. Farmers whose herds were depopulated were compensated for their animals by this fund. The full market price was paid for healthy animals, 50% of that price for diseased animals and nothing for dead animals. In this way, farmers were given an incentive to report suspected cases. From 1994, in the case of CSF, pig farmers who abused the legal hygienic prescriptions (use of special clothes and boots, disinfection facilities), or sourced their animals from more than three multiplier farms, received 35% less compensation. Farmers who could not identify the herds of origin of their animals were not considered for compensation at all. These strict measures were applied to reduce the volume of animal movement and thus to improve the traceability of animals.

Both the Dutch Government and the organised livestock industry contributed to the stamping-out fund, in principle, on a basis of 50% each. The lifetime of the fund was estimated to be five years, but this could be extended at the end of each five-year period by a further five years. The aim of the fund was to build a reserve of US$50 million, in order to compensate for losses due to outbreaks of OIE List A diseases. From the beginning, the fund was credited with US$25 million from the Ministry of Agriculture. Another US$25 million was guaranteed by the organised livestock industry (which did not, however, actually have to deliver the money into the fund). Government payments from the fund were restored on a dollar-for-dollar (50%/50%) basis every year by the Ministry of Agriculture and the livestock industry. The contribution of the livestock industry was not intended to exceed US$25 million over the five-year period. In cases of further expenditure, the so-called 'open end' (that is, the extra money required) would be provided by the Dutch Government. Payments over US$50 million should come not from the budget of the Ministry of Agriculture but from general government expenditure.

Individual farmers contributed to the fund by paying a fixed levy per animal or animal product (slaughter pig, milk, etc.). Adjustments of the levy could be made yearly, depending on the direct costs incurred by eradication in a particular year.

During outbreaks of contagious animal diseases, the money available in the stamping-out fund was used to cover the compensation costs. In the case of extensive outbreaks or of insufficient reserves, the Government and livestock industry shared these costs equally. However, if these costs amounted to more than US$10 million in a particular year, the Government advanced funds, which would be paid back by the livestock industry in subsequent years.
The epidemic of classical swine fever in 1997
In 1997, the Netherlands suffered an extensive epidemic of CSF. The first infected farm was detected on 4 February. The epidemic lasted for over a year, until 6 May 1998 (the date of the last outbreak). During this period, more than 11 million pigs were destroyed. In addition to the minimum measures required by the EU, the Dutch Government applied various additional eradication measures during the course of the epidemic, such as the following:
- the pre-emptive slaughter of herds within a 1 km radius of the infected herd
- a complete standstill of animal movement in areas larger than the officially prescribed minimum area
- the killing and incineration of offspring (aged between 3 and 17 days)
- a prohibition on breeding.

The epidemic affected the area which was most densely populated with pigs in the Netherlands. This fact, combined with the long duration of the restrictions on movement, led to serious welfare problems on farms within the restricted zones. To avoid worsening the problem, animals within these areas were destroyed. This so-called ‘welfare slaughter’ (including slaughter of offspring) accounted for by far the majority of the total number of animals destroyed (8 million out of 11 million). The prohibition on breeding, which was enforced in the midst of the epidemic, avoided the necessity to destroy an even higher number of animals to prevent further welfare problems.

Overview of the losses
Table I gives an overview of the total sum of direct losses caused by the 1997 CSF epidemic (6). This total amounted to US$2.3 billion. The largest part of this sum is due to welfare slaughter (US$852 million). In addition to the losses suffered by the farmers, other sectors along the production chain also incurring losses in the epidemic. The total sum of direct losses suffered by abattoirs, breeding organisations, the transportation industry and feed mills was more than US$590 million.

Distribution of the losses
Farmers were compensated for their depopulated herds and for animals which had been slaughtered and destroyed as a result of welfare slaughter. Farmers were also compensated for sows which could not be bred from, as a result of the breeding prohibition. However, no compensation was paid for consequential losses. These originated principally from idle production facilities on depopulated farms, which could not be restocked because they were located within movement restriction zones. Moreover, other businesses involved in the production chain were not compensated for their consequential losses. Taking into consideration the distribution of losses described in the explanation of the stamping-out fund, Figure 1 shows the distribution of the losses incurred during the 1997 CSF epidemic in the Netherlands, as suffered by each sector. In this figure, the payments provided by the Dutch Government and the EU are given as a single total (62%). Although the Dutch government and the EU funded the majority of the losses, Figure 1 shows that farmers were not compensated in full for their losses. They still had to cover approximately 14% of their losses. Related industries, which were not compensated at all by either the Dutch government or the EU, incurred approximately a quarter of the total direct losses.

Lessons learned from the epidemic of classical swine fever in 1997
The 1997 CSF epidemic was evaluated at length by researchers and policy-makers. The general conclusion was that, to avoid such severe epidemics in future, more attention should be given to the following areas:
- the high-risk period
- animal movement
- the attitude of farmers towards risk
- the new structure of the stamping-out fund.
High-risk period
During the high-risk period, the virus is already present in the country but diseased animals have not yet been detected. That is, during this period, the virus may spread freely from animal to animal or from farm to farm. Simulation studies by Horst (4) and Jalvingh et al. (5) showed that a considerable amount of money is potentially available for measures aimed at reducing this high-risk period. These measures may be as simple as an extensive education campaign to teach farmers and veterinarians how to recognise the disease. Improved monitoring systems may also help to detect outbreaks at an earlier stage. Systematic blood sampling at the abattoir may provide such a monitoring option. However, greater emphasis should be placed on the development of more rapid and more precise diagnostic methods.

Animal movement
Contacts between animals are an important reason for disease spread within the high-risk period. Analyses of the 1997 CSF epidemic showed that, at the time of first detection of the virus, 36 farms were already infected. Analysis of the infection routes showed that, prior to initial detection, animal movements were the major source of disease spread (53%) (7). Reducing the amount of animal movement will slow down the unnoticed spread of diseases such as CSF and FMD. In the Netherlands, several measures were taken to reduce the number of contacts between animals and to encourage the establishment of closed farming systems. One important measure is a change in the approach used to gather contributions from farmers for the stamping-out fund. Since September 1998, the limit of the levy is no longer fixed, but depends on the number of animal contacts (for example, on the number of multiplier herds used by a fattener) and on the location of the farm (whether the farm is within or outside a pre-defined 'pig concentration area'). Farmers can obtain reductions of up to 55% in their levy by reducing animal contacts, and the ideal situation is a closed herd located in a low-density area.

Much emphasis is placed on the establishment of a reliable animal identification and recording system (I&R system) which records all animal movements, at the level of individual animals. Such a system will simplify tracing activities during an eradication campaign. Adherence to all identification and recording system prescriptions is compulsory. Farmers whose animals are not traceable are not considered for compensation in the event of their herds having to be depopulated.

The attitude of farmers towards risk
Better risk awareness may encourage farmers to use more effective management strategies to reduce risk. Education is the first tool in the improvement of risk awareness. Another and perhaps more effective tool is to link a risk-taking attitude with a higher annual levy to the stamping-out fund. This acknowledges the general feeling that those who contribute most to the overall risk of disease should also contribute most to the financial reserves needed to cover the consequences of disease outbreaks. As stated above, the amount of the annual levy has been tied to the number of animal contacts made in the course of farming and to the location of the farm. In future, other aspects may also be included in this system, such as hygiene standards, high frequency of veterinary controls, disease status, etc.

As may be concluded from the above observations, a strategy involving both incentives and disincentives has been chosen to influence the attitude of farmers in the Netherlands towards risk. Farmers are encouraged to apply risk-reducing strategies which are accompanied by a consequent reduction in their annual levy to the stamping-out fund. In the event of outbreaks, farmers who are found to have failed, for example, to register animal movements are disadvantaged by not receiving any compensation if their herds are depopulated.

The new structure of the stamping-out fund
Although a new structure for the stamping-out fund was already in preparation, the 1997 CSF epidemic has hastened the process. In January 1998, the Animal Health Fund was established. This Fund, which is currently applied only to the pig industry, provides funding for a wider range of costs than the former stamping-out fund. The original stamping-out fund financed compensation only for farmers whose animals were destroyed. The new Animal Health Fund finances the following:
- compensation for farmers whose animals are destroyed
- compensation related to welfare slaughter
- organisational costs
- the costs of preventive measures (optional at present).

The final area of funding emphasises the fact that the newly established Fund is not only limited to the eradication of animal diseases but may also deal with the prevention of animal diseases.

The livestock industry contributes to the Animal Health Fund through the annual levy, which is imposed by the Ministry of Agriculture and is based on the particular risk management strategy applied by the farmer (as explained above). The base levy is currently set at a level which will result in an annual income for the Fund of approximately US$55 million. Adjustments can be made to the levy to compensate for the level of payments made from the Fund.

Private sector insurance schemes
The major part of compensation for slaughtered and destroyed animals is currently funded by the Dutch Government, which, in turn, receives partial compensation from the EU. This compensation system will probably continue to exist in the near future, or for at least as long as the EU continues to place the responsibility for eradicating disease on the governments of Member Countries. In this situation, farmers are compensated for their depopulated farms by their national government, and insurance
alternatives are thus only relevant to the consequential losses of farmers and related industries.

Insurance schemes usually involve problems of adverse selection and moral hazard. These problems originate from the fact that people with higher than average exposure to risk are more likely to buy insurance policies, and also from the way in which people change their behaviour after having bought an insurance policy (they become less careful). Insurance companies use several ways of managing these problems, for example, by the use of deductibles and by assigning the insured party to various risk classifications based on, for example, the number of animal contacts.

A major problem in insuring losses from epidemic diseases is the fact that the epidemic disease risk is systemic, meaning that many of those who are insured can suffer losses at the same time. Private sector insurance companies find it difficult to maintain adequate financial reserves and to obtain sufficient reinsurance capacity (i.e. insurance for the insurance company) when dealing with risks that have systemic characteristics. However, recent developments in capital markets provide opportunities to enlarge the reinsurance capacity (2, 8). Partnerships between the public and private sectors may furthermore attract some financial involvement from government.

Confronted with large losses during the 1997 CSF epidemic, farming organisations and insurance companies in the Netherlands are currently exploring the feasibility of an insurance policy for consequential losses from outbreaks of epidemic livestock diseases.

Conclusion

Intensive co-operation between the government, agricultural organisations, institutions and industry is a prerequisite in the rapid and effective control of an epidemic. Government legislation for the prevention and eradication of disease is essential and a mix of 'carrot' (education, reduction of levies) and 'stick' (legislation, fining) is expected to be the most effective strategy.

The attitude towards risk of farmers and others in the production chain may be the most important factor in reducing disease risk. This attitude may be influenced by measures such as a risk-based levy. If the difference between the levy set for risk-avoiding behaviour and that set for risk-taking behaviour is sufficiently large, this measure should prove effective. The greater the difference, the more effective this method is expected to be. At present, this difference is arbitrarily set at a certain amount. As, for some farmers, change to risk-avoiding behaviour will lead to a restructuring of their farm lay-out (to all-in, all-out, larger stables or to a closed system), some years may pass before the influence of the new levy system becomes apparent.

The description of the situation in the Netherlands is an example of contagious disease control within the EU. Different countries throughout the world will take greatly differing approaches, depending on the structure, resources, interests, etc. of the individual country concerned. The EU approach, and therefore also the approach of the Netherlands, is based on the non-vaccination policy. However, the Government of the Netherlands is in favour of reviewing this policy. A catastrophe with a financial impact such as that of the 1997 CSF epidemic in the Netherlands should not be repeated. Every possible instrument which may help to control outbreaks of contagious diseases should be considered.
Rôle des éleveurs et de l’État dans le traitement des urgences zoosanitaires en Europe occidentale et financement des indemnisations

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Résumé

Mots-clés

Participación de la industria agropecuaria y del sector público en las emergencias zoosanitarias y los fondos de compensación en Europa Occidental

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Resumen
En Europa Occidental, el control y la erradicación de enfermedades animales contagiosas siempre han sido objeto de disposiciones legislativas gubernamentales. Ante la eventualidad de un brote, la básica norma de actuación consiste en el sacrificio sanitario total (despoblamiento) del rebaño infectado. El propietario del rebaño suele recibir en tal caso una indemnización por sus pérdidas.

Los autores repasan las formas de participación de los sectores privado y público en las emergencias zoosanitarias y en la financiación de los mecanismos de compensación en Europa Occidental. Se centran especialmente en la evolución de la Unión Europea en este terreno, tomando como ejemplo la gran epidemia de peste porcina clásica que se declaró en los Países Bajos en 1997, cuyas repercusiones económicas describen. La evaluación de la epidemia demostró que conviene prestar especial atención a factores tales como el período de alto riesgo, los traslados de animales, la actitud de los ganaderos ante los riesgos y la
estructura de los mecanismos de compensación. Los planes de seguros contra enfermedades epidémicas parecen constituir una posible alternativa para mitigar algunas pérdidas financieras causadas por brotes epidémicos.

**Palabras clave**

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**References**


