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Making better use of technological advances to meet stakeholder needs

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Summary

Controlling transboundary diseases requires an inclusive and collaborative international approach. Decisions should be taken (and seen to be taken) on advice from multidisciplinary teams of scientists and representatives from all groups significantly affected by the disease (the 'stakeholders'). Changes in trade and travel mean that, unless a new model is developed for disease prevention, there is a real possibility that transboundary animal diseases will become increasingly difficult to control. The traditional government approach of dealing almost exclusively with the commercial sector of the livestock industry is no longer sufficient, and new ways must be found to include all sectors, including 'grey' husbandry (fragmented, disparate groups whose involvement with animals may range from the legal and responsible to the unsanctioned and/or illegal).

The increasing convergence of human and animal health issues makes it imperative to make the best possible use of new tools. The particular challenges confronting veterinary science are: preventing the introduction of disease, rapidly identifying disease and controlling epidemics. This paper focuses on the United Kingdom to investigate the inadequacies of current approaches, identify needs, offer recommendations and propose a new approach to disease control, which emphasises global considerations. The objectives are: better participation across the entire sector, better communication, better science and better decision-making, all of which should lead to better security from disease.

Keywords

Disease alert – Disease control – Grey husbandry – Inadequacy – Livestock management – Livestock-keepers – Partnership – Policy – Registration – Shared responsibilities – Stakeholder – Surveillance – Technological advances – Traditional farming.

Introduction

All livestock-keepers are on the 'front line' of animal disease identification and biosecurity measures. Risks of livestock diseases, including zoonotic diseases, have become a global problem. Disease control must include all national stakeholders and involve regional and international cooperation. Legislation must be based on sound science but also appreciate the wide variety of animal husbandry. In a time of rapid change, old methods may not be sufficient or appropriate. New technologies and innovative approaches should be discussed openly with stakeholders, and more widely explored (32).

Technological advances, when applied to human and animal health, are subject to peer review, intellectual property rights legislation, and budgetary priorities, which generally support national industries. There is seldom a clear priority to control disease for the protection of human and animal welfare and to safeguard a secure food supply. The adoption or 'uptake' of new technologies is further complicated by the multidisciplinary aspects of disease control and the socio-economic-political interactions involved in controlling foreign and endemic disease while trying to maintain a disease-free status. Examples from the United Kingdom (UK) include limitations on the use of vaccination for foot and mouth disease (FMD) due to trade

constraints and limitations on the control of bovine tuberculosis (TB) due to extraneous support for another wild population (the badger). Decision-making processes at local, national, regional and international levels are often further hampered by a poor understanding of the available technologies and the exclusion of many important sectors.

The term 'stakeholder' is of American/English origin and even in English is subject to interpretations from the legal to the looser more modern usage. The term is not easy to translate into other languages, where often the term 'shareholder' is used. However, 'the whole point of stakeholders is that they are not shareholders; that is, they have no ownership in the enterprise but they nonetheless have an interest in its performance' (22).

Those regarded by government as the 'key' stakeholders normally participate in decision-making. However, the 'grey' husbandry sector is often excluded from consultation and discussion, either deliberately or simply because grey management systems are fragmented with no will or means to be represented. This sector includes important but disparate groups that can range from responsible small family farms to organisations conducting practices, such as ritual slaughter and cock fighting, which are acceptable in some countries and illegal in others. This disparate sector may share only the characteristic of having little or no representation with decision-makers but, as they all potentially have a major impact on disease prevention and spread, it is essential to include these groups in all aspects of disease control. Ignoring this sector means risking losing control of disease spread (32).

The importance of these grey areas is demonstrated by the increasing circulation of reports from unofficial sources (as a supplement to official reports from national governments), by international organisations such as the World Health Organization, Food and Agriculture Organization (FAO), World Organisation for Animal Health (OIE), and on-line disease reporting services, such as ProMED-mail (46). Unofficial reports are increasingly the first alert of emerging disease situations to reach the international community.

The risk of the spread of livestock diseases, including zoonotic diseases, is a worldwide problem that needs to be appreciated and tackled globally. An article by scientists from the Italian Public Health Ministry stated that, 'Changes in the livestock industry, such as the rapid transportation of animals over long distances, and the concentration of livestock in large intensive units, are conducive to outbreaks of exotic diseases which can occur unexpectedly' (31).

There is increasing recognition of the need to apply a common approach to the control of animal and human diseases, and to establish strong links between human and animal health clinicians, researchers and public health officials (27). A thorough discussion of the needs and weaknesses of the United States of America (USA) and recommendations to improve preparedness can be found in the Office of Science and Technology Policy (OSTP) Blue Ribbon Panel publication (26). The Royal Society provides a similar analysis and recommendations for the UK (43).

This paper highlights some shortcomings in responses to recent disease situations and suggests possible beneficial changes, focusing on the needs of stakeholders. Examples are taken from epidemics of FMD, classical swine fever (CSF), bovine spongiform encephalopathy, exotic Newcastle disease (END), severe acute respiratory syndrome (SARS), and both high and low pathogenic avian influenza (HPAI and LPAI), as well as the continuing problem of bovine TB (bTB). These events are used to illustrate current inadequacies, while the authors propose recommendations that take better advantage of recent and proposed technological advances. New initiatives, such as the Animal Health Foresight Project, that address these shortcomings and deserve serious consideration by the international community are highlighted.

References in this paper come from unofficial as well as official sources. Since the concerns of stakeholders are presented in unofficial communications, and rarely appear in official peer-reviewed scientific publications (33), the use of both sources is neither accidental nor coincidental.

Animal husbandry

In the context of the control of animal diseases, stakeholders are defined as all those who have a direct or indirect interest in animal disease, due to the potential impact on their lives or the lives of their animals. These stakeholders include:

– national and international competent bodies

– industry

– the rural sector, including farmers, processors and retailers

– keepers of companion animals

– the tourist industry

– the scientific and professional sector, including veterinarians, scientists and economists.

To be effective, animal disease control must involve a true and inclusive cross-section of livestock-keepers from the farming sector. This obviously includes commercial producers, who are often regarded by national governments as the 'key' stakeholders and therefore

routinely included in consultations and decision-making, and have the power to create and implement policy. However, the 'grey' areas of animal husbandry must also be included.

'Grey' husbandry is defined as all livestock management systems whose practitioners are not officially represented and thus rarely have a voice in decision-making. It is a diverse sector, including:

a) those with small family farms

b) those who pursue:

– non-intensive production

– backyard production (often with mixed and unconventional species)

– hill farming

– pastoralism

– nomadic herding or hunting

c) those who keep animals:

– as companions

– for sporting and leisure activities

– as draught animals.

There are some management systems which do not fit easily into the classification of either 'key' or 'grey'. Animals owned as an investment (e.g. racehorses) could be kept under a variety of management systems; zoos and wildlife parks are often represented at national and international levels; and farm animal parks, or animals in laboratories or centres for scientific purposes, are usually represented under special measures.

The term 'grey' refers only to the lack of representation and makes no judgements about the management systems within this sector. Their inclusion in disease control is important because their actions, no less than those in the key industries, affect the entire livestock community and public health. Among all sectors involved in animal husbandry, there will be a range – from those who comply with high standards of biosecurity and animal welfare to others who undertake illegal or dangerous practices, whether deliberately or from lack of funds or knowledge. Both endemic and, especially, transboundary diseases can spread rapidly unless those responsible for disease control take active and effective measures that are acceptable to all involved in animal husbandry.

Current disease control policy is complex, owing to:

– increasing opportunities for the translocation of disease agents

– changing husbandry practices

– environmental changes

– the apparent widening of species specificities of some agents.

The policies of today try to take these facts into consideration and recognise that, for effective surveillance and control, many systems, such as structures of livestock management, veterinary coverage and resource mobilisation, must be linked to highly efficient information and decision-making systems. However, there have been inadequacies in the current policies and practices, many of which stem from a biased understanding of the livestock sector. This has been highlighted recently in the wake of outbreaks of:

– SARS

– CSF

– FMD

– END

– HPAI

– LPAI

– bTB.

Historical perspective

European Community Directive 85/511 excluded the practice of routine vaccination for FMD, ensuring that, in 1990, Member States of the European Union (EU) adopted the policy of stamping out (i.e. slaughtering infected/affected animals and true dangerous contacts) to control disease epidemics through Council Directive 90/423 (19, 20). The intention is to achieve the international trading status of a disease-free region without vaccination. However, stamping out had already been the favoured policy in the UK for over a century. Although this procedure may be considered 'ruthless' when conducted these days – particularly when pre-emptive slaughter is involved – it was, until recently, the only disease control available. In addition, it was effective for diseases that are, unlike FMD in adult animals, fatal with high morbidity, such as contagious bovine pleuropneumonia, rinderpest and African swine fever and CSF.

Woods (51) explained the elevation of FMD 'from a private nuisance to a state-fought plague'. The UK realised the significance of import controls but, when UK livestock was subject to such controls because of spasmodic FMD infection, influential pedigree breeders pressed for the slaughter of infected animals. This eventually became the universal and compulsory policy. New measures were taken to make significant diseases notifiable and to implement passive and active surveillance followed by

eradication and compensation – the critical disease control factors that are currently still in force.

Within the farming community, there is often no consensus on the best control strategies (with the exception of illegal import controls). This was illustrated by the views in 2001 of the National Farmers' Union (NFU), regarded as the 'key' agricultural stakeholder in the UK. Rossides (42) asserts that it is apparent that the UK Government and Veterinary Authorities did not fully appreciate the nature, pattern and scale of livestock movements in the UK. Thus, they did not fully foresee the likely impact of these movements on disease control. Rossides lists sensible recommendations, including the proposal that the Government should work in cooperation with key stakeholders. But if the Government continues to consult only the 'key' sector and ignores the grey, it increases the risk of failing to appreciate the actual nature and pattern of livestock-keeping. This could result in an inability to prepare for and control another disease outbreak.

The anatomy of a disease epidemic

Some of the lack of consensus in the farming community may stem from a scarcity of accurate information about the various disease control options available. There must be open discussion of all such options, particularly when scientific disagreements occur. In all cases, risk analysis must be seen to be open, transparent and inclusive, to give all stakeholders confidence in the decisions taken on their behalf. It is imperative that basic strategies are explained and agreed upon in advance, so that decisions can be taken quickly in the event of an outbreak.

Consultations

Both grey husbandry and large industry have a common duty to submit to the regulations of control policy (e.g. duties of notification, carcass disposal), but the difference is that the latter are consulted. For example, smallholders who requested to be allowed to vaccinate their animals in the 2001 FMD epidemic were refused, without consultation on the issue. Such an oversight can be counter-productive if it fosters feelings of injustice, and results in apathy and loss of trust.

Control policies need to be inclusive in their development and transparent in their application. Consultation processes must also be broad and inclusive, in that all stakeholders should have the opportunity to participate. Government consultations often seem biased towards the well-funded and more powerful sectors of the industry.

The UK process of consultations with stakeholders on disease preparedness and contingency planning illustrates some of these shortcomings. In particular, there has been a lack of open reporting of meetings, which are often held separately, without coordination, involving different groups of stakeholders organised by different groups within the Department for Environment, Food and Rural Affairs (Defra) (33).

Lack of information is a common problem. This is exacerbated by the wide use of temporary emails, which are frequently used to communicate with stakeholders. Moreover, they often replace permanent paper files in government departments. Stakeholders who have responded to various consultations are often critical that the time and energy they have devoted to this process seems useless when their responses have been lost in the electronic ether.

Communication channels must be enhanced to ensure that accurate, up-to-date and unbiased information is readily available and widely distributed to all stakeholder groups. The ProMED-mail system of archiving provides an excellent model (http://www.promedmail.org/). For example, a search on 'PRO/AH> Avian influenza – poultry vs. migratory birds' gives instant access to both historical and up-to-the-minute reports and moderators' comments on this topic.

Alerts and awareness

Livestock-keepers need targeted alerts and specific advice when faced with an increased risk of infection. Blanket recommendations to livestock-keepers and their veterinarians, without accompanying details, are not helpful. General and regional alerts should be posted on government websites, and specific red alerts should be sent to organisations and registered, individual livestock-keepers, using an automated system of direct, personal communication, for example, by email or messages to mobile phones.

Educating livestock-keepers through effective targeted communications on disease risk would enable them to judge the risks relevant to their holdings, and prepare and implement appropriate biosecurity measures. It would help to ensure that they inspect their animals, not only for endemic diseases but also for unusual clinical signs. Rapid identification of disease is essential, both at the endemic source and in preventive surveillance. This requires the cooperation of animal-keepers, who are in the front line. For a wide variety of reasons, there may be a serious lack of ability and/or willingness on their part to recognise and report suspicious clinical signs. Fundamental in encouraging the cooperation of livestock-keepers is to give them choice and control.

From the perspective of the keepers, the first stage in a potential outbreak is to routinely examine their animals.

What do they do when faced with an animal showing a suspicious clinical symptom or sign? If the animal concerned is of low value or medical advice (proportionately) is too costly, the possible disease is unlikely to be reported, and the animal will probably be consumed, sold, thrown in the rubbish bin or buried on-farm.

Reporting

The willingness of livestock-keepers to report suspicious signs depends on a variety of factors, in addition to the direct veterinary costs:

– education
– awareness (including alerts)
– incentives
– compensation
– safe, rapid and affordable disposal of carcasses
– trust.

Relationships with neighbouring holdings may also play a role: while it is in the interest of neighbouring holdings to have an outbreak quickly identified and controlled, the resulting imposition of prolonged movement restrictions discourages reporting.

Livestock-keepers are sometimes reluctant to report a suspected disease and have samples sent for testing because of the effect on their own and neighbouring holdings. Rapid on-farm diagnostics can clarify suspicions and alleviate unnecessary hardships. Such diagnostics could be used to screen for notifiable diseases. Adverse results would then justifiably initiate or 'trigger' quarantine and movement restrictions, while samples are sent to reference laboratories.

Suspicious signs may be noticed first when animals are taken to market or agricultural shows, where there may be routine veterinary inspections. Reporting in these cases can vary. Consideration should be given to active surveillance at these locations.

Failure to report will lead to failure to identify an early index case and thus a catastrophic delay in finding the primary case(s). This can lead and has led to epidemics. To encourage reporting, various authorities (5) have proposed that incentives should be offered, in the form of increased compensation, to all those reporting early signs of disease. Early identification and recognition is essential to containing disease spread. Compensation is important for all livestock-keepers, and for all aspects of disease control, as discussed above.

Reporting by the veterinary practitioner as a basis for surveillance

Some larger enterprises will have their own veterinary support, sometimes permanently on-site. Many from the grey sector will lack that support, so their first decision is whether or not to seek veterinary advice. In some circumstances, veterinary support is simply not available, for example, as reported in a suspected outbreak of FMD in Punjab (6). Numerous examples can be found from sources such as ProMED-mail and the University of California, Davis, FMD Surveillance and Modeling Laboratory.

In most countries, state-run disease surveillance still has a bias towards accurately reporting only exceptional diseases, so that common diseases seen on farms (e.g. contagious ecthyma in sheep in the UK) are reported as low incidence (under-reported), whereas it is well recognised that the opposite is true. The same surveillance systems implemented for exotic diseases should also monitor endemic diseases, so that adjustments can be made when grading the disease according to impact. Early control actions may reduce the impact of these common diseases.

Efficient sampling of suspicious cases, as a basis for movement restrictions, vaccination and slaughter

When a notifiable disease is suspected, samples should be taken and tested from all potential cases, especially in the early stages. Portable, rapid on-site or near-site tests should be used to ensure appropriate movement restrictions can be imposed promptly, for a positive test, and to prevent lengthy restrictions if there is no disease (4, 14). Depending on circumstances, these samples should also be sent to a diagnostic laboratory for confirmation, and, if appropriate, to identify the serotype for vaccine use. Wider movement restrictions may be implemented as soon as laboratory confirmation occurs. Care should be taken to preserve a record of all test results and ensure that they are available for epidemiological analysis.

To ensure the efficiency of disease control strategies, a review of the way(s) in which field samples are delivered to the reference laboratories (as a support or 'back-up' to rapid on-site testing, to act as the model or 'gold standard' for identifying an index case, as well as to determine the identity of the serotype for vaccine production) is essential. Delivery must be rapid, direct and traceable and may need to involve other agencies, such as the armed forces or police. Written protocols and standard operating procedures (SOPs) must be integral to any plan to ensure forensic standards are maintained during collection, preparation, transportation and delivery. Problems that can

arise, such as carriers refusing to transport samples or delays until a pilot will accept such a cargo, as well as customs delays, reinforce already powerful arguments for the use of on-site diagnostic testing.

Surveillance and biosecurity

The essential components of a surveillance system are:

a) the reporting of unusual symptoms, rapid diagnostics and identification of patterns;

b) an enhanced role for a geographical information system (GIS) linked to an information technology (IT) system, which would avoid some of the mistakes made in identifying the locations of holdings or of groups of animals as occurred in the UK in 2001. It would also enhance, for example, risk analysis by incorporating a local application of relevant meteorological and other information;

c) the collection, storage and sharing of disease information (32).

All three of these components depend on an acceptable and effective system of individual animal identification and registration of livestock holdings.

It is important that these components mesh together. Rapid identification of disease is essential, both at the endemic source and in preventive surveillance, requiring the full cooperation of animal-keepers. It is also essential, and a government responsibility, that surveillance has a direct effect on what policies are drafted and what actions are taken.

Information databases

Rapid analysis and detection of animal-related risks (RADAR) (13) is a new government information management system being developed in the UK, which collects veterinary surveillance data from many different sources in a common format, so that the information can be combined. The objective of RADAR is to make it possible to analyse this information and then publish reports, highlighting:

– the threats to public health and animal health and welfare

– the risks they pose

– the geographical areas at risk.

The database should be inclusive and avoid the present bias or 'skew' that is currently inherent in veterinary surveillance systems. This skew is an effect of the samples submitted not being representative of the common problems seen on farm (they are predominantly submitted from animals suffering from problematical or unusual symptoms), and thus have an inbuilt bias against reflecting the true incidence of problems seen on farm. However, good surveillance cannot be effective without the political will to tackle particular disease problems.

One development in the UK is the Farm Health Planning Initiative, in which farm health plans are developed by the livestock owner, in conjunction with their veterinary surgeon (9). This should improve the rapid recognition and reporting of unusual symptoms or signs at the site of an index case. Ideally, the farm health plan is based on:

– local husbandry practice

– knowledge of the local disease risks

– close knowledge of the specific holding involved.

This helps the industry to identify and treat existing problems, so as to eradicate them or at least minimise their effects. Proper quarantine and isolation facilities will be established for any new animals and a detailed written protocol put in place to ensure that no visitor, visiting vehicle or equipment can exacerbate problems. The plan should provide a written record of how the livestock industry plays an active role in the partnership against emerging disease.

While it is essential that this type of data is available in a meaningful and useful format to all those concerned with animal health, rather than only to official outlets, confidentiality must also be considered. If the confidentiality of livestock-owners is not protected, they will be less willing to report any suspected disease.

Another way to enhance disease surveillance and control is to allow private sponsored surveillance, such as that provided by Hachaklait, a Mutual Society for Clinical Veterinary Services and Livestock Insurance in Israel (http://www.icba-israel.com/icba-haklait.html), and the National Animal Disease Information Service (NADIS) (http://www.nadis.org.uk), a network of 40 sentinel veterinary practices and six veterinary colleges which monitor animal diseases in the UK. Due to a wide distribution of practices, with over 100 more having expressed an interest in joining the network, NADIS provides a regional representation of information across the whole spectrum of endemic diseases of interest to farmers, veterinary surgeons and the government. Together with other disease surveillance systems, NADIS could provide a basis for syndromic surveillance, with data to help highlight the presence of any new emerging disease. At present, the funding for this excellent system is through limited sponsorship, and collecting the data involves considerable effort from the sentinel veterinary practices. There is a time lag in retrieving the information, which is

recorded, transcribed and distributed monthly. A more rapid turnaround would be possible, using newer tools, if core funding were provided.

Registration of livestock

Registration systems for livestock should be developed, which are both acceptable and beneficial to government and the livestock sector.

For the government, effective control strategies require accurate information on the numbers, locations and management systems of animals, and the contact details of the owners.

For the livestock sector, benefits should include receiving targeted alerts and:

a) information on risks, so that livestock-owners can take appropriate, on-farm biosecurity measures

b) advice, so that they are aware of the tools and control options available, particularly during an outbreak

c) assistance, so that they have access to the necessary diagnostic and vaccination tools and/or safe slaughter and disposal.

Currently, there is a perception amongst many livestock keepers that registration with the government will be a fast track to slaughter in the event of a disease outbreak. In fairness and to attract livestock keepers to register, real benefits such as those outlined in the points below need to be offered. During a disease threat, those who register with management systems which would justify specific derogations such as from slaughter or trade restrictions or exemptions such as from keeping animals indoors (e.g. premises that are closed holdings or have approved/inspected biosecurity or testing regimes) must receive a benefit as recognition for their registration. This would be a reasonable basis on which to allow quarantine and vaccination, rather than slaughter, and therefore eliminate the cumbersome UK proposal (discussed below) which depends on numbers of animals of specific species, rather than on the real risks associated with management systems and/or species' susceptibility.

The authors therefore suggest a mutually beneficial system of livestock registration, in which owners could choose to register with the government or a private veterinary scheme. Those who register their livestock with the government would:

– have access to rapid diagnostic testing as soon as suspicious clinical signs are reported. If their animals test negative for the presence of antibodies against the disease, they would have the option of vaccination or quarantine, subject to further testing;

– be able to have their livestock vaccinated if vaccination is authorised (eliminating complicated schemes of rare breeds requiring a specific number of breeding males and females to be eligible for vaccination);

– be able to have their livestock slaughtered at a pre-agreed rate of compensation.

Those who register with a private veterinary practice or group would have the option of quarantine and testing in an outbreak, but at their own expense, possibly through an annual insurance agreement, or with the assistance of a non-governmental organisation. Under the private option, the government would benefit from access to a channel of communication that would not otherwise be available.

Anyone outside either option could then be considered outside official livestock-keeping, with a justifiable suspicion of illegal practices or lack of knowledge (providing that adequate information on registration was available and that the above schemes were well run and not prohibitively expensive).

Geographical information systems

Accurate predictive 'real-time' models of disease behaviour have been made possible by GIS, used in conjunction with satellite information. However, those in control of modelling must be veterinarians familiar with animal disease behaviour, or serious misconceptions may arise (23, 24, 25, 28, 30, 47, 48). M.E. Hugh-Jones (personal communication, 2004) notes GIS systems in which global positioning system (GPS) chips: 'are incorporated into handheld data loggers, these sites can be recorded automatically without the risk of error. Too many farms in 2001 were identified by map reference numbers and slaughter initiated, or attempted, in spite of owner claims that the stock were not affected; in each case the slaughter team had the right map reference but the wrong map, or vice versa. Nobody needs such lethal and expensive mistakes.' It is logical to build GIS into the registration process.

Animal identification

To have a regulated and safe livestock industry, it is necessary to be able to:

– trace the movement of individual animals along the production chain

– correlate the product with the site of production

– identify animals in an emergency.

For this, it is important to have an identification and tracking system that is simple to use, easy to administer,

avoids duplication, is difficult to circumvent and which links easily with GIS systems to pinpoint exact locations. Electronic implants, such as the National Livestock Identification System used in Australia, are sufficiently advanced to accomplish this, but their recovery at the abattoir is not yet perfect and food safety issues must be considered (3). Manual tagging and paper records entered on to a central computerised database seem quite a clumsy system compared with new technologies and, even with this slower and more labour-intensive manual method, mistakes occur. The EU has a target of adopting electronic identification of all major farmed species by 2008. Various methods are in place at present, including microchips, boluses, ear tags, and photographic and description identification of specific features.

Non-invasive technologies for individual animal identification would be welcomed by the livestock community, and research into their development should be encouraged. These include biometrics and deoxyribonucleic acid (DNA) identification, from, for example, fibre samples for mitochondrial DNA.

Active surveillance

The cooperation of the livestock sector and the effective use of a continuous, real-time active national surveillance programme are essential in the rapid identification of disease. A formal, active FMD surveillance methodology, described by Bates *et al.* (2), includes the following:

– using new technologies (e.g. portable, rapid diagnostic devices) in cost-effective mass screening and environmental testing

– integrating transboundary disease surveillance into existing mass-screening systems for endemic diseases

– strategic targeting of high-risk animals, times and locations (e.g. at milk collection, in livestock markets)

– strategic use of specimens submitted for routine diagnostic testing.

It is essential that, during collection, the data are not skewed or artificially unbalanced, especially if these data will be used to determine current and future control measures.

Improvements in surveillance and control are needed at all levels: local, national, regional and international. There are a number of prerequisites for the classical approach to establishing and maintaining a national disease control programme, as identified by Shimshony and Economides (46). These are:

– controls on the importation of animals and animal products

– efficient disease monitoring in the field

– rapid and reliable laboratory diagnosis

– epidemiosurveillance, with appropriate communication networks both within and outside the country

– an effective veterinary infrastructure in the field to apply the necessary disease control measures, either directly or with accredited professionals

– appropriate rules and legislation, and tools to enforce them effectively.

This is indeed an ideal and a target. Few, if any, countries completely satisfy these prerequisites at present.

Assessing which new diseases should be regarded as notifiable

The example of low pathogenic avian influenza

The outbreak of END in the south of England in 2005 raised concerns over migrating waterfowl and the risk of introductions of avian influenza (AI). The Chief Veterinary Officer considered the risk to be low because the waterfowl carried LPAI. However, the Panel on Animal Health and Welfare of the European Food Safety Authority assessed the risks of mutagenesis of LPAI to HPAI as being significant enough to recommend the inclusion of H5 and H7 LPAI, together with HPAI, as notifiable diseases (18). The Panel recommended such measures as:

– limiting contacts between wild migratory birds and poultry

– limiting movements and contacts of animals and people between farms

– updating education for farmers

– promoting cooperation between epidemiologists and ornithologists who map bird migration routes.

The Panel also recommended including LPAI in the legislation banning imports of live birds and products from countries with recent outbreaks of HPAI, in addition to tightening import controls on the trade in feathers, down and manure. Moreover, they highlighted the need for:

– development of an early warning system to monitor LPAI

– identification of high-risk areas (those in proximity to migratory bird pathways or wintering sites)

– maintenance of safe distances between farms

– regional contingency planning for mass culling

– vaccination.

Previously unknown diseases

Shimshony (45) identified the need for active syndromic surveillance, especially to identify newly emerging diseases. Syndromic surveillance refers to methods relying on detection of individual and population health indicators that are discernible before confirmed diagnoses are made (29, 38). In other words, this involves the collection and description of developing symptoms rather than reporting the identification of a particular disease. As an example, he discussed the epidemic of Rift Valley fever (RVF) in Egypt, which led to the OIE categorising RVF as a List A disease in 1980. There were problems at all levels, with the most serious being the absence of early detection and reliable reporting systems. Shimshony commented that, 'the initial diagnosis of RVF, when it has penetrated a previously unaffected territory for the first time, is notoriously difficult, index cases usually being misdiagnosed'. He noted that, when the disease spread into South Africa for the first time, in 1950, it took six months, with some 20,000 clinical cases in humans; and 100,000 mortalities (as well as many abortions) in sheep and cattle, before a definite diagnosis was made. Murray and McCutcheon (35) observed that even the strongest preventive management systems cannot guarantee that outbreaks of animal diseases will not occur. They cite outbreaks of previously unknown diseases, such as equine morbillivirus, which was discovered in Australia in 1994, and had significant animal and public health implications, which no system could have prevented. The emergence of SARS, linked by recent evidence to bats, also demonstrates that it may be difficult to survey the movements of unknown agents especially when the syndrome closely mimics a known disease.

A previously unknown vector can also present difficulties, along with research opportunities. The recent evidence that links bats to SARS, Nipah and Hendra viruses presents an opportunity for scientists to break the transmission chain (1), but illustrates the need to be careful not to lay the blame too quickly on certain animals, practices or management systems.

For effective surveillance, stakeholders, especially in the grey sector, must be involved.

Biosecurity on the farm

Consideration should be given to biosecurity issues, such as whether other animals and people visit the farm. Closed herds, where new animals do not enter, reduce the risk of disease introduction.

To control bTB and other diseases, the creation of different herd categories has been proposed, with varying levels of biosecurity, according to the particular management system and the purpose for which the herd is kept. A closed herd with good fencing, which is not in contact with any other farmed livestock, in an area with no recognised incidence of bTB, would be a very low-risk herd (especially to a species of low susceptibility). However, a herd with active movement of breeding stock and visiting males, kept on a farm near to other cattle, in an area with a recognised incidence of TB, would be a high-risk herd. These categories could be widened to include other disease prevention strategies and should be part of a written health plan devised with the local veterinary surgeon (41). Competent farm biosecurity needs to be formally and positively recognised as part of outbreak control. Where regulations are perceived as disproportionate, unscientific, unreasonable or inadequate, rules are more likely to be broken. Stakeholder collaboration and support is vital in achieving farm biosecurity.

Legal imports of live animals

The movement of live animals is a controversial topic among stakeholders, due to animal welfare concerns and disease risks. It is helpful to distinguish between animals imported as companion animals or for genetic diversity, and animals imported for food. The disease risks from all live animal imports can be controlled through diagnostic tools. Most live animals that are intended to remain alive are subject to quarantine and further testing, unless they originate from a region that only requires certificates (e.g. between EU Member States). As there are risks of introducing animals with preclinical, subclinical and asymptomatic infections, further measures should be taken by the importing country. Rather than relying only on export certificates, all imported live animals, or an agreed sample, should be appropriately re-tested with negative results before being released to the new owners. The costs for this testing should be met by the owners. The community of stakeholders is therefore involved and when informed would, it is hoped, support the additional costs.

With regard to genetic diversity, new and inexpensive embryo transfer technology can reduce the need to transport live animals for breeding, although this may not be suitable for all species. International guidelines are available on diseases that can be avoided using artificial breeding techniques (54).

The arguments for and against the import/export of live animals for food are complicated by considerations of traditional practices (as opposed to a more general consensus to have animals slaughtered at the nearest point to production), which are not within the scope of this paper. However, strict measures can also be taken here to reduce the risks of disease spread, by programmes of active and targeted surveillance.

Targeted use of diagnostic tools, accompanied by enhanced biosecurity measures and proper controls, provides protection for meetings where animals and humans mingle, such as livestock markets, agricultural shows and companion animal fairs.

There are constant risks from the exotic companion animal or 'pet' trade, from illegal imports of live animals, meat products and 'bushmeat'. This is discussed elsewhere by Wooldridge *et al.* (52).

Partnership: shared responsibility and mutual benefit

Towards a genuine partnership between government and industry

On the EU FMD and CSF Coordination Action (CA) website, views have been sought from stakeholders on how to improve the relationship between the livestock sector and government. Breeze (5) suggests disease control cost-sharing in a partnership between government and industry, implying responsibilities for both. Industry can expect 'performance benchmarks' to be set for components such as an inducement scheme for early reporting, rapid verification and rapid communications: '... the government should ... be prepared to demonstrate that it is meeting its Performance promises...'. Breeze advocates rewarding vigilance instead of threatening negligence. For example, extra compensation would be given to the first owner reporting a suspicious case that proved to be an infection of concern. This bonus would also be paid to those subsequently reporting suspicious cases that prove positive within the first two weeks after a definitive diagnosis.

At the Netherlands Presidency of the European Commission Conference on the 'Material and Immaterial Costs of Animal Disease Control' in 2004, Rudman (36), as Chair of the Committee of Professional Agricultural Organisations (COPA) and the General Confederation of Agricultural Co-operatives in the EU (COGECA), reported that, while there are many endemic or on-farm infections or conditions that livestock farmers can deal with, given appropriate advice, there are also diseases that are not within their power to prevent. Disease prevention on a national scale is the province of government. Rudman pointed out the responsibility of government not only to ensure food safety, but also to control disease whilst avoiding regulations and responses that could unbalance economic competition. He argued that these measures cannot be borne as a primary cost by food producers.

Where national biosecurity measures fail to protect the national herd or flock from epizootic disease, Rudman argues for adequate compensation for direct loss (personal communication, 2005; 36). He explains that the EU Veterinary Fund provides compensation of up to 60% of the market value of the animals destroyed and is fully supported by the European Agricultural Guidance and Guarantee Fund. Rudman also emphasises the deleterious effect that the withdrawal of central funding from these bodies would have on control programmes across the EU. It is his opinion that the threat of withdrawal of compensation for disease outbreaks or epidemics caused by transboundary exotic infection is unacceptable and must remain the responsibility of government.

Pappi and Henning (37) record the importance of organisations such as COPA/COGECA in informing and influencing policy decisions within the EU. This type of representation is an important way of giving EU stakeholders a chance to participate in policy decisions.

Unnecessarily complicated interpretation of the European Union foot and mouth disease directive

The European Union foot and mouth disease directive (7, 21) allows special provision to protect genetic diversity during future outbreaks by establishing a list of farms or holdings where a 'breeding nucleus' of rare or special breeds is held.

The way in which Defra has chosen to interpret this is unclear in the latest Defra contingency plan, version 1.1 (11), where Defra has removed the detailed requirements that were specified in the previous version, 1 (10), implying that these important details have not yet been finalised and are therefore still open to revision (12). However, these details continue to appear on other Defra (7, 8) and livestock association (39) websites. The suggested UK system of classifying holdings by numbers of males and females (the 'breeding nucleus') of certain species, recognised by the Rare Breeds Survival Trust, is an extremely limiting approach, is unnecessarily complicated and restrictive, and would be virtually impossible to enforce. That such uncertainty in interpretation, which could cause considerable confusion and delays in the event of an outbreak, persists more than 5 years since the 2001 epidemic is a matter of serious concern to stakeholders (17).

The complex criteria are described by the Rare Breeds Survival Trust as follows (39):

'Any special provisions would only apply to those premises that hold breeding nuclei of FMD susceptible animals. The

established definition of a breeding nucleus for each breed is as follows:

Cattle: minimum of 8 females plus minimum of 1 male (or AI [artificial insemination])

Sheep: minimum of 16 females plus minimum of 1 male (or AI)

Pigs: minimum of 3 females plus minimum of 1 male (or AI)

Goats: minimum of 6 females plus minimum of 1 male (or AI)

Eligibility criteria:

– the breed must be listed as rare in the UK's Report to FAO on Farm Animal Genetic Resources

– the breed must be native to the UK

– the animals must be registered with a recognised breed society

– the premises must have a breeding nucleus equal to or exceeding the minimum numbers/population above.'

'Based on these criteria we [Defra] will be able to compile a register of holdings which contain breeding nuclei of genetically valuable stock which may qualify for special measures in the event of an outbreak' (10).

It should be noted that factors other than genetic diversity may be relevant in deciding which animals should qualify for special measures in an outbreak. These may include behaviour characteristics and training (e.g. llamas trained for trekking).

The registration system is a welcome development and should be open to any livestock-keeper who wishes to register and will comply with the requirements. In return, the livestock-keeper should have increased options available, subject to veterinary approval, such as quarantine and vaccination, without regard to the numbers of animals in the holding. This would avoid any temptation to move animals simply (and, in the event of an outbreak, illegally) to achieve the required number to protect against slaughter. The registration database could include other relevant information, such as the management system and species in the holding, as well as listed rare breeds and genetically valuable animals. While accurate knowledge of numbers and species is an important component to preventive vaccination, specifying minimum numbers of animals as a pre-requisite to derogations adds unnecessary complications, especially in an emergency. Uncertainty and unclear regulations could be even more problematic.

Enforcement

Regulations should be based on the best scientific advice on the most effective, proportionate and acceptable disease prevention measures, not on whether the regulations are difficult to enforce. (See the Defra reports on meetings with stakeholders on the CA website: fmd-and-csf-action.org.) In what other areas is legislation against activities avoided simply because of the potential difficulties of enforcement? Such considerations have not prevented the UK Government from legislating against hunting with dogs, even though police forces acknowledge that this legislation is difficult to enforce, and despite protests from many stakeholders that this legislation will lead to considerable problems, e.g. disposal of fallen stock and the spread of mange in foxes and dogs. The enforcement of illegal import legislation can be enhanced by increasing surveillance, including forensic testing.

When regulations are perceived as disproportionate, unscientific, unreasonable or inadequate, rules are more likely to be broken. Use of appropriate, including new, technologies would reassure stakeholders that regulations are being adequately enforced. The use of inappropriate or unvalidated decisions 'casts long shadows', affecting not only the final financial and economic costs of an epidemic but the health of communities and individual farmers.

The psychosocial effects of the 2001 UK FMD epidemic in a rural population were investigated in a qualitative, diary-based study by Mort *et al.* (34). They found: '…profound psychosocial effects of the disaster among a wide range of rural workers and residents that would not be revealed by more traditional biomedical or health research methods…'. The study reveals that, 'continuing feelings of bereavement, fear of a new disaster, concern about the undermining of the value of local knowledge', long after the end of the epidemic, still cause distress. The 'loss of trust in authority and systems of control' expressed by the respondents is perhaps one of the most worrying aspects of the study.

Individual animal identification and traceability

There has been some resistance to animal identification systems on the grounds of confidentiality and practicality, by both the commercial sector and small-scale producers. In the USA, producers worry that they will lose control of information about their animals and operations with a government-run trace-back system that, according to livestock industry sources, suffers from a lack of funding and ever-changing ideas about system features and which equipment to use. The National Cattlemen's Beef Association believes that the livestock industry could assemble a less expensive and more flexible system faster than the government and is spearheading a private-sector

database (40). While their proposed system is not as complex as everybody would like, it could be used by producers to store data such as feed records, breed lineage and health care, and this 'value-added' information could help to defray its costs.

While some producers doubt the government could keep their records confidential, others express scepticism about trusting a private database with the information. Another suggestion is for the government to remain in charge but to contract out some of the work (40). Breeze also addresses these concerns on the Internet (4).

There may also be resistance to government identification of animals in other cultures, where the benefit of gaining knowledge for disease control may be regarded as secondary to concerns about the disclosure of details on personal wealth.

One proposal for research into alternative data collection strategies is discussed in the OSTP report (26). A suggestion is the development of technology platforms (electronic or internet based systems for data collection), with the real-time capacity to develop large databases from private databases very quickly in an emergency.

The uptake of new technologies

Tools that are becoming increasingly sophisticated and powerful should be used appropriately and effectively. However, they should also be applied with common sense, and respect for the traditional and often simple practices that have been effective in the past. Changes in agricultural and trade practices which lead to the rapid spread of disease require the use of new technologies, especially as part of an active surveillance programme. Quick and effective surveillance by non-invasive diagnostic technologies and support with rapid on-site tests that can be used in conjunction with the tracing of animal movements would be a way in which new technologies could be incorporated.

These technologies should be made available where needed, with international assistance to ensure they can be adopted by communities that cannot afford the associated costs.

Stakeholders sometimes express concern that new technologies may not be fairly evaluated or used because of conflicts of interest, the protection of local jobs and research grants and a preference for supporting technologies developed by national governments. An example in the UK is a perceived reluctance by government laboratories to accept on-farm, rapid diagnostic tests. When new technologies are introduced, there may be a shift in some fields of employment, but national and private diagnostic laboratories will always be required. Ideally, new technologies should be evaluated and first used in non-crisis periods, rather than during an epidemic, to avoid misinterpretations arising from unfamiliarity.

The selection of a particular diagnostic device (53) should be based on fitness for the purpose, even if it was developed in another country. The costs of prevention and effective control must certainly outweigh the benefits of supporting a local device if it is not ready and/or not as fit for the purpose. There will almost always be a need for a wide variety of devices which are useful in different situations. For example, some real-time, reverse transcription polymerase chain reaction devices are very heavy, and only suitable for use in a mobile laboratory, while others may be lightweight and highly portable but require considerable training to use. Thus, the latter should only be employed by qualified members of a Veterinary Service or taskforce. Some will be multiplex (i.e. designed to detect and differentiate several infectious agents in a single assay), especially useful in screening imports and at places where livestock gather. Rapid pen-side tests, e.g. lateral flow devices, which could easily be used without training by livestock-keepers, may be helpful as a guide for movement decisions, especially in the aftermath of an epidemic, or as a quick guide to protect veterinary practitioners who are examining animals with uncertain symptoms.

Stakeholders need assurance that such partisan concerns will not determine the acceptability of new technologies. Research into innovative tools should also not be impeded by the approach that, 'what we have now already works well, so why change?' International advice must be considered to ensure that the most appropriate tools for the purpose are used. The costs of an epidemic must always be set against the costs of prevention, early detection and effective control.

Rudman, who is veterinary and public health adviser to the National Farmers' Union (NFU), has pointed out that livestock-keepers need to have confidence in the authority of a test, i.e. know that the technology is effective, consistent and will not lead to more uncertainties (P. Rudman, personal communication). 'For all farmers' impatience with Government, they want official sanction of the methodology if their businesses are at risk.'

One example of investment in new technology is that food retailers are willing to introduce radio frequency identification (RFID) technology, which will mean costly changes in their supply chains. However, to add perspective, 'the high level of investment allows only the biggest retailers to implement the technology' (16).

In the field of animal disease control, researchers cannot afford to let these expensive technologies be available only to the commercial sector. Governments should invest in technologies which protect their national animal and public health.

When trust is lost, how can it be regained?

While stakeholder involvement should be more inclusive, it is not possible for all stakeholders to have a direct voice in policy-making. New approaches that would help stakeholders from the livestock, veterinary and government sectors to work in partnership should be investigated.

An example of a practical measure is the proposal for registering livestock (outlined below), either directly with the government or through appropriate representative bodies.

An Animal Health Association, where all sectors can meet, discuss their concerns and propose and vote on resolutions, would be a welcome development. An example is the United States Animal Health Association (www.usaha.org), whose stakeholders include livestock-keepers and representatives, scientists and government regulators. This Association provides an independent forum where differing views can be expressed and explained, disagreements can be discussed and conflicts potentially resolved.

The goal is for stakeholders to have trust in those who make decisions, and in the decisions that are taken. A properly constituted, permanently operational and balanced Expert Group, as specified in the EU FMD Directive 2003 Article 78 (1) (21), would reassure stakeholders and give them confidence that any decisions are based on the best advice, as analysed by the Royal Society in their Annex A the technical input into the decision-making process (43).

A welcome step in this direction has been taken by the European Commission through their support of the Coordination Action on FMD and CSF (fmd-and-csf-action.org), which brings together researchers and stakeholders. The partners, from European reference laboratories, the FAO, OIE and the European Commission, work together to eliminate gaps and duplications in research. Stakeholders, especially those from the livestock and veterinary sectors, will have access to accurate, unbiased information and the opportunity to discuss issues on line. The intention is to establish a permanent platform for communication. Another complementary EU initiative is the European Technology Platform for Global Animal Health which also began in early 2005.

An Animal Health Foresight Project conducted in 2005 by Canada and the USA, with international participation including Chief Veterinary Officers (CVOs), sought disease control alternatives to mass animal destruction and the accompanying problems of mass carcass disposal. 'Based on the opinions and observations expressed by the participants, 10 conclusions were derived leading to the development of a new paradigm for animal health – all based on animal-health optimization rather than destruction' (50). The critical change elements that were analysed as part of a new paradigm for animal health are science and technology research and development, education, engagement, information management and communications. Together, these will help the drive towards the optimum resolution which will provide incentives to share data and report disease and to help create a pre-emptive plan for the next crisis, as well as increasing the proper use of tracking and diagnostic technology, improving public trust, empowering consumers to make informed decisions and enhancing the risk management approach to disease control. The need for international standards to be changed to match a risk management approach was considered an important component (49).

The SSAFE initiative is a global alliance launched in 2006 by the OIE and hosted by the University of Minnesota (USA) which intends to provide input from the entire food supply chain, to facilitate and enable progress in strengthening the global food safety system as well as animal disease prevention and control worldwide, and to leverage resources through public-private partnerships for collective action (55).

It must be recognised, however, that decisions on disease control are never simple and never without controversy.

Recommendations

These recommendations for improvements are broad and flexible, in recognition of the wide range of:

– differing livestock management situations

– access to funding for appropriate and effective tools

– relations between governments and veterinary agencies

– decision-making processes throughout the world.

Disease control measures should be taken in partnership with all sectors, and allow livestock-keepers some degree of choice and control.

a) Animal disease control must involve a true and inclusive cross-section of livestock-keepers, including 'grey' husbandry, which may be represented by a variety of organisations, as well as the 'key' stakeholders.

b) Small-scale and traditional farming deserve support, as they rarely have access to expensive technologies, but provide a range of benefits, including food security and environment enhancement. They also act as sentinels for disease outbreaks, especially in relation to covert or illegal activities, such as livestock smuggling and 'bushmeat'.

c) Effective communication channels are crucial to provide:

– accurate and unbiased information, including alerts (using modern communications technologies)

– explanations of the available technologies (e.g. diagnostics and vaccination)

– a forum for discussion

– a way of contributing to national, regional and international decision-making.

d) The degree of stakeholder involvement in policy-making should be assessed to promote a true partnership. Mechanisms to assist this process should be considered, such as the creation of national and regional Animal Health Associations. Such associations would work in partnership with government, that is, independently but with government participation. They would have the power to propose resolutions and to vote, as a check and balance on the powers and responsibilities of the Chief Veterinary Officer, particularly if there is evidence that national consultations are not adequate.

e) Decisions about control measures must be based on expert, unbiased and balanced advice, from a permanently operational group. Bodies that have a mandate to 'challenge' this advice must be adequately informed and should only exercise their challenges in non-crisis periods, not during an emergency, which can lead to confusion and delays.

f) Control measures must be applied flexibly and with sensitivity to local needs and traditions but remain effective… sometimes a difficult balance.

g) Livestock registration should be encouraged, and organised with an important component of incentives and choice. Registration can occur as a partnership between government and livestock-keepers or a representative organisation. Benefits to the government would include accurate information about livestock populations and management systems to assist effective control measures. Benefits to livestock-keepers would include receiving targeted communications to aid in effective planning and on-farm biosecurity measures, and the possibility of implementing appropriate and proportionate controls throughout the production chain according to individual circumstances, e.g. an on-site pathogen testing system could support quarantine, rather than slaughter, as an option and allow certification of disease-free status. Reactions to the threat of notifiable diseases are generally government-led, with varying degrees of producer control. Access to laboratory and on-site testing is controlled through different mechanisms in different countries. This inconsistent restriction adds a further complication to international policies on disease control, allowing producers in some countries, but not in others, the ability to use surveillance data for the security of their own industries (15). Herd/flock registration could be indicated on a retail label to assure consumers of enhanced testing of the product. However, confidentiality issues must also be addressed.

h) Innovative approaches (including incentives and compensation) to educate and encourage livestock-keepers to recognise and report unusual signs and symptoms should be explored and encouraged.

i) The role of clinical inspection should be reassessed, as a result of the advances in portable, rapid pathogen-detection devices, although clinical diagnosis will still be the basis of suspicion of disease in the first instance.

j) The role of portable, rapid diagnostic technology should be reassessed, to aid in disease control and management and reduce the burden on reference laboratories during an epidemic.

k) Control decisions, such as movement restrictions and vaccination strategies, should be rapid, supported by the use of on-site or portable diagnostic devices linked to GIS and accurate databases of livestock populations, meteorological conditions, etc. They should also be capable of identifying and responding to previously 'unknown' emerging diseases.

l) Efficient sampling of suspicious cases must be the basis for:

– declaration of an index case

– imposing movement restrictions

– using slaughter as a control measure.

Field samples should be delivered to reference laboratories to support rapid on-site or near-site testing, and supply accurate data (thus acting as the benchmark) in a rapid, direct and traceable manner. This process may involve other agencies (such as the armed forces or police). To ensure forensic standards are maintained during sample collection, preparation, transportation and delivery, appropriate written protocols and SOPs must be integrated into any plan. This plan should be established during non-crisis periods and available to all laboratories.

The establishment of the Animal Health Foresight Project (49, 50), which was discussed at the USAHA meeting in 2005 and which encapsulates the ideas in this paper, appears to have been subject to a very quiet approach. The responsibility for informing stakeholders rests with the CVOs and national governments of each participating country, providing an exciting opportunity to demonstrate

responsiveness to national accountability and international cooperation.

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Faire un meilleur usage du progrès technologique pour répondre aux besoins des parties prenantes

M.J. Marshall, P.A. Roger & J.B. Bashiruddin

Résumé

Le contrôle des maladies transfrontalières nécessite une démarche internationale de grande ampleur et fondée sur la coopération. Il faut prendre les décisions (et le faire savoir) sur la base d'avis émanant d'équipes pluridisciplinaires de scientifiques et de représentants de tous les groupes qui sont fortement affectés par la maladie (les « parties prenantes »). L'évolution du commerce et des voyages signifie que, si l'on n'élabore pas un nouveau modèle pour la prévention des maladies, il est très possible que les maladies animales transfrontalières deviennent de plus en plus difficiles à contrôler. La démarche habituelle des gouvernements, qui consiste à s'occuper presque exclusivement du secteur commercial de l'élevage, ne suffit plus et il faut trouver de nouveaux moyens pour prendre en compte tous les secteurs, y compris l'élevage « gris » (les groupes fragmentés et disparates dont l'attitude envers les animaux peut être au mieux respectueuse de la loi et responsable, et au pire incontrôlée, voire illégale).

La convergence de plus en plus forte entre les questions de santé humaine et de santé animale oblige à faire le meilleur usage possible des nouveaux outils. Les défis particuliers auxquels est confrontée la science vétérinaire sont les suivants : prévenir l'introduction de maladies, identifier celles-ci rapidement et contrôler les épidémies. L'article se concentre sur le cas du Royaume-Uni pour rechercher les insuffisances des méthodes actuelles, identifier les besoins, offrir des recommandations et proposer une nouvelle approche de la lutte contre les maladies, qui met l'accent sur les considérations de portée mondiale. Ses objectifs sont une meilleure participation de tout le secteur, une meilleure communication, une meilleure connaissance scientifique et un meilleur processus de decision, améliorations qui devraient apporter plus de sécurité face aux maladies.

Mots-clés

Alerte sanitaire – Besoin – Élevage gris – Élevage traditionnel – Gestion du cheptel – Inadéquation – Lutte contre la maladie – Partenariat – Partie prenante – Politique – Progrès technologique – Surveillance.

Mejor uso de los avances tecnológicos para satisfacer las necesidades de las partes interesadas

M.J. Marshall, P.A. Roger & J.B. Bashiruddin

Resumen

La lucha contra las enfermedades transfronterizas requiere soluciones que aúnen colaboración internacional y carácter integrador. Para tomar decisiones conviene basarse (y dejar claro que así se hace) en los dictámenes de equipos multidisciplinares compuestos por científicos y representantes de todas las partes que sufran las consecuencias de la enfermedad (las "partes interesadas"). La reciente evolución de los modos de comercio y viaje supone que, a menos que se elabore un nuevo modelo de prevención de enfermedades, existe la posibilidad real de que cada vez sea más difícil controlar las enfermedades animales transfronterizas. La solución que tradicionalmente adoptaban los gobiernos (ocuparse exclusivamente de la vertiente comercial de la industria ganadera) ya no basta, y en este sentido es necesario encontrar nuevas fórmulas que engloben a todos los sectores, entre ellos la ganadería "gris" (colectivos heterogéneos y fragmentarios cuyo trabajo con los animales puede ir desde lo lícito y responsable hasta lo tolerado y/o lo claramente ilegal). La creciente convergencia entre los problemas de salud humana y los de sanidad animal obliga a hacer el mejor uso posible de las nuevas herramientas. Entre las dificultades que afronta específicamente la ciencia veterinaria están las de prevenir la introducción de enfermedades, detectarlas con rapidez y controlar las epidemias. Los autores se centran específicamente en el Reino Unido para reflexionar sobre la inadaptación de los planteamientos actuales, determinar las necesidades existentes, formular recomendaciones y proponer nuevas formas de controlar las enfermedades, poniendo el acento en el trabajo a escala mundial, todo ello con vistas a cumplir los siguientes objetivos: una participación más amplia de todo el sector; una mejor comunicación; más profundos conocimientos científicos; y decisiones más acertadas, todo lo cual debería traducirse en una más sólida protección contra las enfermedades.

Palabras clave

Alerta sanitaria – Alianza – Avance tecnológico – Control de enfermedades – Ganadería tradicional – Gestión ganadera – Inadaptación – Necesidad – Parte interesada – Política – Vigilancia.

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