EMERGENCY DISEASES FROM AN AUSTRALIAN PERSPECTIVE

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Summary

The Australian Veterinary Emergency Plan was designed to provide a national response plan to combat emergency diseases. The role of the Consultative Committee on Exotic Animal Diseases includes both advice on control and eradication procedures and payment of compensation resulting from an emergency disease outbreak. Endemic emergency diseases are related to minimum farm management standards. The exotic emergency diseases virulent avian influenza and Newcastle disease have occurred in Australia a number of times and every outbreak has been eradicated. Suggestions made in 1995 that the poultry industry should participate in an auditable accredited scheme for the farming sector resurfaced in 1998 as Commonwealth and State governments became more concerned over the increasing compensation payments being made. The industry now faces new major challenges as it reviews its perspective on emergency diseases.

I. INTRODUCTION

"Emergency diseases" is a term that has been introduced into the Australian animal industries' vocabulary in recent times. It covers both exotic animal diseases and endemic animal diseases that from time to time cause severe economic losses in an industry. In the poultry industry context, even as recently as 1996, the term emergency disease related only to the two exotic diseases, Newcastle disease and virulent avian influenza.

II. THE AUSTRALIAN VETERINARY EMERGENCY PLAN

The Australian Veterinary Emergency Plan (AUSVETPLAN) was first published in 1991 although the concept was initiated as early as 1976. It was designed as a coordinated national response plan for the control and eradication of exotic animal diseases. In the introduction to the AUSVETPLAN Summary Document on Poultry (ARMCANZ 1996a) there is the following paragraph:

"Australian agriculture benefits enormously from its freedom from the more devastating epidemic diseases that plague livestock industries in other parts of the world. The introduction of these foreign diseases could cause serious production losses to livestock industries in this country, jeopardise exports of livestock and livestock products and/or have serious public health implications. It is therefore essential that effective contingency plans and well-trained personnel are available to counter any exotic diseases that penetrate our quarantine barriers. Australian policy is to eradicate any introduced exotic animal disease as expeditiously as possible, if this is at all feasible."

It is very difficult to disagree with this statement. However, it is an irony that, of the seven poultry exotic disease outbreaks that have occurred in Australia since 1930, only the first is considered seriously to be the result of a "foreign" disease. There is some doubt about one of the avian influenza outbreaks. There are no conclusions as to the origins of the viruses that caused the remaining five outbreaks.
In any case a stamping-out policy was implemented on each occasion and this involved:

- quarantine of the infected premises and movement controls;
- the slaughter and disposal of the infected and exposed animals;
- decontamination of the infected premises;
- surveillance of susceptible animals; and
- restriction of the activities of the infected and other poultry enterprises.

This policy has proved to be effective in each case. With such a plan in place it is inevitable that legislative backup is required. In Australia, each State and Territory has operational responsibility for the control and eradication of animal diseases, whether endemic or exotic, within its borders. Each State and Territory therefore administers its own exotic disease control legislation. This legislation is further supported by emergency service arrangements. In all cases these provide adequate powers for all essential exotic disease eradication measures. Commonwealth legislation includes powers under the Quarantine Act 1908 that would be available to support, where appropriate, the States and Territories.

III. CONSULTATIVE COMMITTEE ON EXOTIC ANIMAL DISEASES

In any discussion on emergency diseases it is necessary to mention the Consultative Committee on Exotic Animal Diseases (CCEAD) and the Commonwealth/States Cost Sharing Agreement. The CCEAD is a committee of State/Territory Chief Veterinary Officers (CVOs), the Head of the Australian Animal Health Laboratory (AAHL) and the Chief of the Division of Animal Health of CSIRO. It is chaired by the CVO of Australia (from the Commonwealth Department of Agriculture, Fisheries and Forestry). The consultative committee was originally established in June 1941. Its terms of reference are:

- to consult on exotic and serious epizootic animal disease emergencies;
- to advise on control or eradication methods;
- to make judgments regarding the diagnosis of exotic diseases of livestock for the purpose of invoking the provisions of the Commonwealth/State financial arrangement for combating outbreaks.

Under the Commonwealth/States cost-sharing agreement for the eradication of certain exotic animal diseases, the total cost of eradication is borne by the Commonwealth (50%) and the States/Territories (50%). Each State/Territory pays a proportion fixed according to a formula established for each of the twelve diseases covered. The cost-sharing agreement applies only while CCEAD advises ARMCANZ (Agriculture and Resource Management Council of Australia and New Zealand) that “eradication is considered to be reasonably possible”. The cost-sharing agreement is in place for twelve exotic diseases including Newcastle disease (in its classical virulent form) and virulent avian influenza (ARMCANZ 1996b).

IV. ENDEMIC EMERGENCY DISEASES

Emergency diseases of an endemic nature usually caused by a viral infection are invariably controlled by vaccination. Egg Drop Syndrome (EDS ’76), very virulent Marek’s disease (vvMD) and infectious laryngotracheitis (ILT) are three good examples.

While not a problem in Australia at present, very virulent infectious bursal disease (vIBD) and Salmonella enteritidis could rapidly become emergency diseases if introduced into our poultry flocks. Duck viral hepatitis, duck viral enteritis and turkey rhinotracheitis are other examples. Diseases that are normally controlled by vaccination such as infectious bronchitis (IB) and fowl cholera could become emergency diseases only if there was a breakdown in either
efficacy or supply of good vaccines. Vaccination is not the panacea but only one of the many factors necessary to control an emergency viral disease.

Good management procedures with adequate attention to biosecurity are essential ingredients in any poultry farming operation. It goes without saying that sheds should be proof against wild birds and animals, vermin, pets and unauthorised people. An adequate and safe water supply is an obvious prerequisite to a poultry farm establishment. The logical extension of this concept is that all poultry farms and farm management procedures should adhere to a minimum industry standard. This theme is followed up later in the paper.

V. EXOTIC EMERGENCY DISEASES

The two emergency diseases of an exotic nature, i.e. diseases that do not normally occur in Australia, virulent avian influenza and Newcastle disease, are certainly treated differently.

(a) Virulent avian influenza

The first outbreak of virulent avian influenza in Australia was in Victoria in January 1976. The Victorian isolate was identified at Weybridge UK as Dutch 27 fowl plague virus first isolated in Indonesia in 1927 and not recorded anywhere since. The source of that virus was never established. As I recall, the farm was of such a standard that it was buried along with the birds that died or were slaughtered. Clean up and compensation costs were $220,000.

In May 1985 there was a second outbreak in Victoria, this time in Bendigo. This particular outbreak caused the industry and the State and Commonwealth Governments much concern as the consequences of the devastating 1983-84 outbreaks of AI in Pennsylvania and Virginia in the USA were still very much in people's minds. Clean up and compensation costs were $2.2 million.

Obviously avian influenza was becoming of greater concern to government. In April 1991 the Australian Quarantine Inspection Service (AQIS) discussion paper (AQIS, 1991) on the importation of chicken meat into Australia contained the following commentary:

"AI is found in domestic poultry, seabirds, waterfowl and wild birds. The disease may range from subclinical to one with mild symptoms or may be highly acute and fatal. In countries where outbreaks of the disease have been reported, huge economic losses resulting from mortalities, losses in production, sales and costs of control measures, were incurred. The virus has a worldwide distribution and several antigenic subtypes are recognised. There is an enormous reservoir of influenza A subtypes in wild (mainly waterfowl) and domestic birds. The migration and congregation of waterfowl in wetlands play an important role in the maintenance of a reservoir for avian influenza viruses." This AQIS comment did not necessarily relate to the Australian situation, but it probably does.

The causative antigenic subtypes isolated in 1976 and 1985 were identical (H7N7). In July 1992, another outbreak of avian influenza occurred in Victoria, in the same area near Bendigo where it occurred in 1985. Specimens were forwarded to the Australian Animal Health Laboratory (AAHL) late on 30th July. A preliminary diagnosis of avian influenza was provided shortly after midnight and this was confirmed later in the morning of 31st July. The property was placed in quarantine and slaughter of the stock commenced on the next day.

Work at AAHL was undertaken to isolate the virus, determine its identity (H7N3) and confirm its pathogenicity by inoculation of chickens and ducks. This was reported by 5th August. The outbreak was confined to one property and eradication was effected rapidly and efficiently, with minimal interruption to interstate trade. The cost of clean-up and compensation was $1.3million.
Avian influenza was diagnosed on a layer property in Lowood, Queensland, in December, 1994. The producer had seen a rapidly increasing mortality rate in one shed. The diagnosis was made quickly using the suite of tests available for avian influenza. The virus was typed as virulent H7N3 strain but was different from the H7N3 responsible for the Bendigo 1992 outbreak. All diagnostic procedures worked well, with the speed of diagnosis allowing disease control programs to be quickly introduced by the Queensland Department of Primary Industries.

The cost of clean up and compensation was $500,000.

In November 1997, another disaster. Avian influenza (H7N4) struck a large well-managed chicken broiler breeder operation in Tamworth NSW. It subsequently spread to a broiler chicken farm and also involved some free range emus and a hatchery in Sydney. A total of 310,565 chickens and 1,232,074 hatching eggs were destroyed during the operation. The total cost involved in the eradication was $4.445 million, which comprised $2.168 million in compensation and $2.277 million in operating costs. Costs were again shared between Commonwealth, State and Territory Governments.

What effect do these repeated outbreaks of avian influenza have on the Australian perspective to emergency diseases?

In February 1988, the Victorian Department of Agriculture and Rural Affairs (DARA) now Department of Natural Resources and Environment (DNRE), issued a Technical Report (Miller and Simpson-White, 1998): “Guidelines for preventing exotic and serious endemic poultry diseases”. This publication was developed by a joint DARA/poultry industries working party established to review and upgrade operational procedures to combat exotic and serious endemic poultry diseases. It took two years for 18 people to write the guidelines - admittedly only six made it through the whole process. The extraordinary situation was that at the time of the AI outbreak at Bendigo, some four years later, virtually no reference was made to the Guidelines. Truly an example of having reinvented the wheel. We had not learnt a lot since 1985. The very first points mentioned in the DARA report were:

- sheds are to be secure against entry of all birds ........
- water must be clean and free from contamination by free flying birds ..chlorination and ultra-violet treatment is recommended ....

It went on to mention feed storage, hygiene facilities, visitors’ books, dead bird disposal. The perspective hasn’t changed, but little has been done by many sections of the industry. In 1989 in NSW, the Agriculture Department issued an AGFACTS sheet on “Poultry health - keeping disease out”. Highlighted were:

- surface water can be contaminated by wild birds. Treat any surface water to be used for drinking ...
- bird proof your sheds so that wild birds cannot get into them.

In 1992 at the time of the second Bendigo outbreak, NSW Agriculture issued an information sheet simply headed Avian Influenza (Fowl Plague). Under the heading “Prevention” we read:

......given that this disease (AI) is now in Australia and the virus is known to be present in wild birds these principles are critical ......:

- bird proof your sheds especially against water fowl ...
- provide a safe water supply.

Again in December 1994 in Lowood, Queensland, An AI outbreak. Siterep 23rd December:

“The most likely source of the outbreak is contamination of creek water by wild water birds .....”
Water was considered by many people to have been involved in the 1997 AI outbreak in Tamworth. However, Dr George Arzey in Dander (Newsletter of the Australian Veterinary Poultry Association) (Arzey, 1998) in August 1998 expressed his concerns that water (from the Peel river) may not have been involved. He suggested that diseases may be introduced to farms by various routes and that all aspects of biosecurity need to be addressed by producers...... His article concluded as follows:

"The disease hazards on each farm need to be identified, control measures need to be identified and implemented perhaps in order of cost, ease or consequences. Monitoring for each measure is as important as the implementation. It is not enough to install a footbath in front of the shed. Monitoring compliance and adherence to certain standards is essential."

(b) **Newcastle Disease**

Newcastle disease (ND) first came to international attention in Newcastle-on-Tyne, England, in 1926. It is a highly contagious viral disease of domestic poultry, cage and aviary birds and wild birds. It is characterised by digestive, respiratory and/or nervous signs. The disease has a number of strains that differ in the severity of their clinical signs, ranging from inapparent infection to a rapidly fatal condition.

There have been three outbreaks of Newcastle disease in Australia. The first two were in 1930 and 1932 in Victoria and as far as can be ascertained they were the same virus from the original source. On that occasion the disease entered Australia on infected poultry carcasses. This happened in Victoria and cooked poultry scraps were, apparently, discarded from a ship in Port Phillip bay, picked up by seagulls or other birds and an infection reached the commercial poultry industry. Of course the industry was very small at the time and an eradication program was eventually successful. Nevertheless at the time it was seen as catastrophic for the Victorian industry which was virtually all laying fowls on the ground.

The industry perspective on ND has been based on the premise that it is the major disease threat to the viability of the Australian commercial poultry industry. It is also regarded as a major potential threat to the pet and native bird populations. The significance of the disease has been acknowledged in numerous government publications. Quarantine pamphlets issued by the NSW Department of Agriculture in 1974 and the Commonwealth Department of Health, Quarantine Division in 1984, describe Newcastle disease as "the most feared avian disease in the world".

In the industry’s opposition to the importation of chicken meat into Australia much was said about the consequences of an ND outbreak. The cost of attempted eradication of the disease would be very high. Both cost and consequence would depend to a large extent on where the outbreaks occurred. The worst, and most likely scenario would be an outbreak in the Sydney-Newcastle region. The outer Sydney metropolitan area/Hawkesbury/Newcastle-Hunter region supports large numbers of broilers and layers as well as elite breeding flocks, grandparent breeding flocks and multiplication flocks. The cost of quarantine, control and eradication programs to the industry and Commonwealth and State governments are difficult to estimate.

However, based roughly on the cost of eradication of three outbreaks of avian influenza in recent years it is suggested that a widespread ND outbreak could cost $30-40 million to eradicate. One of the better known ND outbreaks occurred in California in the early 1970s. That outbreak took two years to eradicate, 11 million birds were destroyed and the total cost was $56m (US). Our Australian estimate is not exaggerated.

If the disease could not be eradicated, very large costs associated with mortality and loss of production due to clinical disease, with purchasing and applying vaccines and loss of trade would be incurred on an ongoing basis.
There is insufficient knowledge of the effects upon and spread of the disease in native bird species and this means that the effect on Australia's native bird population is inestimable. What we do know is that our native bird population is highly susceptible to virulent Newcastle disease and an outbreak would be a disaster.

It is not surprising therefore that the industry was shocked and immensely concerned when ND was confirmed on two farms in western Sydney in September 1998. Subsequently a third farm became infected by chickens it received from one of the Sydney properties. At the time of writing this paper the outbreak appeared to be totally controlled. The three farms had been depopulated and clean up and disinfection were about to commence. The ND virus involved was highly pathogenic. Fortunately transmission of the virus appeared to be by physical contact and quite slow moving. As was the case in the AI outbreaks CCEAD was activated. Also, following a recent change to policy, an Incident Management Group of three government and two industry representatives was established so that deliberations of CCEAD could be quickly disseminated to industry. The anticipated major disaster did not occur on this occasion.

The significant difference between the 1998 Newcastle disease outbreak and all the previous outbreaks was that the costs of clean up and decontamination of the infected properties were to be borne by the property owners.

VI. THE NEED FOR A NEW PERSPECTIVE

In July 1995 I presented a paper at the Queensland Poultry Science symposium on Avian influenza in review - its significance, cost and control (Fairbrother, 1995). A year later I spoke at the Queensland Poultry Information Exchange on ‘Exotic diseases - the implications of further outbreaks’ (Fairbrother, 1996).

As reported in my 1995 paper, I wrote as follows to the Animal Health Committee of the Standing Committee on Agricultural Resource Management:

"My personal attitude has long been one of dismay and despair at the lack of quarantine precautions and low standard of hygiene at many poultry farms and processing plants in Australia. The lack of bird proofing of sheds and the reluctance of poultry farmers to treat water on their premises and to remove the ability of water fowl to effectively cohabit with their flocks, is appalling.

The accreditation of farms (from a disease viewpoint) would be difficult to implement, although it has some attractions. The problems with accreditation and monitoring of farms to ensure that standards are maintained could become a very costly option. As we move into the ISO 9000 mind-set, however, auditing will become the name of the game and there could be substantial merit in auditing against a Code of Practice.

In any case, cleaning up the operations of many commercial egg farmers and smaller broiler farmers would be a good start. An industry Code of Practice, as was suggested following the 1985 AI outbreak in Bendigo, would also help. Probably such codes already exist, but one wouldn't think so when you have a look around the industry."

The suggestion that following restocking a farm should not be permitted to recommence operations until appropriate bird proofing and water treatment facilities have been installed at the owners expense, is fully supported. There should be no exceptions.

Since I made those outlandish comments in 1995 there have been two more exotic disease outbreaks in 1997 and 1998. We have also had serious problems with vvMD, an emergency with EDS ‘76 and one or two ILT outbreaks. All were emergencies as far as the industry was concerned.

Times, attitudes, available funds and perspectives are changing - rapidly.
ARMCANZ at its meeting No 12 held on 27 February 1998, in its Resolution No 20, requested, *inter alia*, “AAHC to review with industry involvement procedures for funding and management of AI, in particular the use of compensation, where industry does not meet acceptable management criteria”.

In June 1998 the Australian Animal Health Council established a Task Group to review management practices and procedures to reduce avian influenza outbreaks in the poultry industries. The terms of reference of the task group included the following:

1. Describe and critically analyse guidelines for good management practices in the chicken meat and egg laying industries as they relate to the risk of incursion of AI.
2. Review the AUSVETPLAN Enterprise Manual for the poultry industry and compare this with any existing codes or guidelines described in 1 above.
3. Review the industry’s adherence to these practices particularly with regard to AI risk prevention and minimisation.
4. Present recommendations on the criteria for payment of compensation for losses following stamping out and cleaning up after an emergency disease situation has passed.

On the 18th September 1998, even before the ink was dry on the terms of reference, Newcastle disease was confirmed on two properties in western Sydney, as already outlined. Along with the disruption to business involving quarantine, movement controls both within and between States, tracing product, logging vehicle movements, waste disposal and surveillance of surrounding farms, there is the impact on overseas trade. Australia has a significant trade in poultry and poultry products, including day-old chickens, particularly to Papua New Guinea and the Pacific islands. The Australian Quarantine and Inspection Service investigated the implications for trade and imposed interim restrictions on the provision of health certificates pending clarification of other countries’ certification requirements for poultry, poultry products, ostriches and their products and emu products.

AQIS also contacted individual authorities and Australia’s overseas posts as required regarding the continuation of trade based on existing or revised certification and animal health measures applied by NSW Agriculture. The effective and timely introduction of control zones around affected or at risk properties certainly helped minimise any commercial impact. As expected, some countries placed a total ban on exports from Australia while others placed a ban on products from NSW. The length of the ban varied from six months to one year.

Another critical issue that will change the poultry industry’s perspective on emergency diseases relates to changes in the rules for compensation payments. In early 1998 the Centre for International Economics completed a report for the Australian Animal Health Council Ltd on *The funding of exotic animal disease management* (Anon, 1998). Subsequently in August 1998 the AAHC conducted a workshop on this matter and in September a small expert working group was established to make recommendations on, among other things:

- the cost sharing proportions between government and industry for specified diseases;
- what costs should be eligible for reimbursement.

It is quite clear that the Commonwealth and States will no longer bear the total costs of compensation resulting from an emergency disease outbreak. Diseases will be categorised and the industry proportion could vary from zero to 80 per cent of the total cost. The final categorisation and industry share of costs should be known by early 1999. How the poultry industry will raise its contribution in the event of an emergency disease outbreak is a moot point.

This raises again the issue of accreditation and auditing of poultry farms in all their forms. Many hatcheries, processing plants, grading floors and stock feed mills already have auditable HACCP plans in place. All these facilities are discussed in the existing AUSVETPLAN Enterprise Manual for the poultry industry (Gilchrist, 1996). This document had
its genesis, at least in part, from the 1988 DARA (Victoria) Technical Report. Currently the most critical area is the poultry farming sector.

VII. CONCLUSION

An agreed industry Code of Practice for the operation of poultry farms from a biosecurity and hygienic practice viewpoint based on HACCP principles is the first step required. An accreditation system will have to be put in place and be backed with an audit program. The whole program should be driven by industry but it may be necessary to support the program with minimum government regulation if industry cooperation is not forthcoming. Any program must be fair and equitable to both small and large operators. It must be said that a significant percentage of the poultry industry already has suitable programs in place.

Such a program will not necessarily eliminate future emergency disease outbreaks. However, it should result in better biosecurity and a much improved standard of hygiene in the poultry farming sector generally. Only an audited accreditation program will provide the industry generally with confidence that their business will not be jeopardised by a few sub-standard operators.

The Australian perspective has changed over time. It will without doubt become increasingly circumspect about emergency diseases. In the long term everyone will benefit.

REFERENCES


