

AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Operational Procedures Manual Livestock welfare and management Version 3.0, 2007

AUSVETPLAN is a series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.

Primary Industries Ministerial Council

This disease strategy forms part of:

AUSVETPLAN Edition 3

This strategy will be reviewed regularly. Suggestions and recommendations for amendments should be forwarded to:

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IMPORTANT NOTE: Important regulatory information is contained in the OIE Terrestrial Animal Health Code, which is updated annually and is available on the internet at the OIE website:

http://www.oie.int/eng/normes/en_mcode.htm.

DISEASE WATCH HOTLINE

1800 675 888

The Disease Watch Hotline is a toll-free telephone number that connects callers to the relevant state or territory officer to report concerns about any potential emergency disease situation. Anyone suspecting an emergency disease outbreak should use this number to get immediate advice and assistance.

Preface

This operational procedures manual for livestock welfare and management is an integral part of the **Australian Veterinary Emergency Plan**, or **AUSVETPLAN (Edition 3)**. AUSVETPLAN structures and functions are described in the **AUSVETPLAN Summary Document**.

This manual describes the administrative procedures to be used to address animal welfare issues in the event of an animal disease emergency. It also sets out various management strategies that can be used by owners and managers to adjust to the restrictions imposed during such an emergency. Throughout, the emphasis is on pre-emptive actions that might be taken to avoid the development of adverse welfare situations. For each species, a brief industry overview is included for the benefit of people who might not be familiar with a particular livestock industry.

The procedures in this manual have been approved by the Primary Industries Ministerial Council (PIMC) out of session (PIMC 11) for use in an animal health emergency in Australia.

The manual incorporates welfare guidelines for the major livestock species that are referenced in the relevant *Australian Model Codes of Practice for the Welfare of Animals* and the *Australian Standards for the Export of Livestock*. Various suggested management strategies have been drawn from extension publications of state/territory departments of agriculture, together with material from relevant industry organisations.

During several recent animal disease emergencies overseas, notably in the United Kingdom and the Netherlands, animal welfare was identified as a major concern. The experience in those countries has provided salutary lessons in devising appropriate welfare strategies for Australian livestock managers.

Detailed instructions for the field implementation of AUSVETPLAN are contained in the disease strategies, operational procedures manuals, management manuals and wild animal manual. Industry-specific information is given in the relevant enterprise manuals. The full list of AUSVETPLAN manuals that may need to be accessed in an emergency is:

Disease strategies

Individual disease manuals for each of 31 EADs
Response policy briefs (for EADs not covered by individual manuals)

Operational procedures manuals

Decontamination
Destruction of animals
Disposal
Public relations
Valuation and compensation

Wild animal manual

Wild animal response strategy

Enterprise manuals

Artificial breeding centres
Dairy processing
Feedlots
Meat processing
Poultry industry
Saleyards and transport
Veterinary practices
Zoos

Management manuals

Control centres management (Parts 1 and 2)
Animal Health Emergency Information System
Laboratory preparedness

Summary document

In addition, *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians* by WA Geering, AJ Forman and MJ Nunn, Australian Government Publishing Service, Canberra, 1995 is a source for some of the information about the aetiology, diagnosis and epidemiology of emergency animal diseases.

This manual has been prepared by Dr Michael Bond, Veterinary Consultant, Canberra. Scientific editing was by Biotext, Canberra.

The revised manual has been reviewed and approved by:

Government

Commonwealth of Australia
State of New South Wales
State of Queensland
State of South Australia
State of Tasmania
State of Victoria
State of Western Australia
Northern Territory
Australian Capital Territory

Industry

Australian Chicken Meat Federation Inc
Australian Egg Corporation Limited
Australian Dairy Farmers' Limited
Australian Lot Feeders' Association Inc
Australian Pork Limited
Cattle Council of Australia Inc
Goat Industry Council of Australia
Sheepmeat Council of Australia
WoolProducers

The complete series of AUSVETPLAN documents is available on the internet at:
<http://www.animalhealthaustralia.com.au/>

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1 Introduction

1.1 Objectives

Although disease control and eradication is the major objective in any emergency animal disease (EAD) response, the maintenance of acceptable animal welfare standards should be an integral part of that goal. This manual describes the husbandry strategies, assessment procedures, roles and decision-making processes to be implemented in the event of an EAD outbreak to ensure that animal welfare requirements are met.

Whatever the circumstances, animal welfare should always be regarded as a high priority. All livestock (including those intended for euthanasia) have basic welfare needs, such as:

- adequate feed and water;
- adequate space;
- freedom from pain, injury, disease and obvious discomfort;
- freedom from unnecessary fear and distress; and
- the ability to express normal patterns of behaviour.

In the event of an EAD outbreak, animal welfare can be put at risk by several factors. These include difficulties in obtaining feed and restrictions on movement of animals, which can lead to overcrowding.

The underpinning principle in addressing animal welfare in an EAD outbreak is to take appropriate pre-emptive action before a welfare problem is allowed to develop. Such action should be based on sensible management strategies, relevant information about each property, rigorous risk assessment, and a timely, transparent and auditable decision-making process.

The aim is to ensure:

- destruction of the minimum number of noninfected animals or suspects during the EAD response;
- maintenance of acceptable animal welfare standards for all livestock species, without compromising disease control and eradication efforts;
- effective management of animals within restricted areas and elsewhere, based on sound risk assessment, to avoid later welfare problems; and
- best use of available resources (personnel, infrastructure, feed and water).

Animal welfare is a shared responsibility of everyone involved. However, as in other emergencies such as flood, fire or drought, the owner, manager or custodian of the animals involved has primary responsibility (duty of care).

Designated animal welfare personnel will be located at the local disease control centre (LDCC) and state/territory disease control headquarters (SDCHQ) to provide advice and coordinate actions aimed at avoiding welfare problems.

However, it is imperative that everyone involved in the EAD response is aware of the importance of animal welfare and the need for accurate, reliable information on which to base decisions. All field operatives are required to report any concerns about existing or potential animal welfare problems to the animal welfare officer (AWO) at the LDCC.

1.2 Animal welfare and ethics in an EAD response

While the primary goal of an EAD response is disease control, it is important that animal welfare is a consistent element of the decision-making process. Decisions about animal welfare and the fate of disease-free animals should be based on scientific evidence and social, economic and ethical considerations.

In an EAD response, a lower standard of animal welfare will be tolerated during the emergency, compared to the normal standard. However, no animals should be subjected to inhumane or crowded conditions for an extended period. It is important that a documented contingency plan is in place to permit the survival of the greatest number of animals. The appropriate disease response personnel should be aware of, or involved in, the preparation of this plan.

In a full-scale emergency, it is likely that it will not be possible to meet normal standards of animal care. The situation must then be managed to achieve the survival of the maximum number of disease-free animals, which can recover once normal conditions are restored.

The incursion of an EAD will result in three types of emergency:

- disease control and eradication, focused primarily on infected and high-risk properties;
- general financial emergency (market collapse) affecting all sectors of the production chain, but especially producers;
- welfare problems as a consequence of movement restrictions and inability to dispose of growing stock or obtain normal feed supplies.

In emergencies, animal welfare is at greater risk than usual. The speed of events can place great pressure on everyone, especially owners or custodians of animals that might be at risk. The pressure will be increased by a rapid deterioration in market conditions, which can lead to animals and animal products losing value overnight.

The risk will be greatest in intensive production systems.

In the event of a widespread outbreak, there will be even greater potential for serious animal welfare problems to develop. Experience has shown that animal welfare will be at most risk when a particular livestock industry is export oriented, and international markets are suddenly closed (Whiting 2003).

Despite the considerable stress imposed on owners and managers during an animal disease emergency, every effort should be made to ensure that all animals receive a reasonable level of care and attention. It may be necessary to defer some routine husbandry procedures or veterinary treatments.

Depending on the disease, the species involved, the extent of disease spread, the anticipated duration of the emergency, market conditions and the situation on a particular property, owners should seriously consider suspending breeding programs. For many enterprises, especially those based on cattle and other seasonally breeding animals, this will be a major decision with significant long-term consequences.

In many EAD outbreaks, the value of livestock is likely to fall dramatically because of serious disruption of stock movements and closure of markets. Any property owner who might be tempted to purchase stock at devalued prices should carefully consider the risk of potential welfare problems if the emergency is prolonged.

1.3 Effects of restrictions in an EAD response

Virtually all planned EAD responses require some restrictions on the movement of animals, products and equipment.

1.3.1 Animal welfare effects

Movement restrictions imposed during an EAD response can:

- prevent animals from being moved or slaughtered according to normal production schedules;
- disrupt the delivery of normal feed supplies, especially for intensive industries;
- encourage the illegal movement of animals and feed.

The most immediate and dramatic effects may be experienced in the intensive livestock industries, where available space and feed reserves are often the critical limiting factors. The situation in extensive grazing industries will usually be less urgent, except for particular circumstances (such as livestock in transit or drought-affected stock).

During an EAD response, it may be necessary to destroy animals that are infected or suspected of being infected. Once that decision is made, the slaughtering procedure should be carried out in an orderly, well-planned and humane manner. The organisation of destruction and techniques for euthanasing animals are covered in the **Destruction Manual**.

AUSVETPLAN operational manuals focus on the eradication measures that would be required for the 'worst case' scenario – a foot-and-mouth disease outbreak. A range of other non-endemic animal disease threats would also trigger an EAD response. The control and eradication measures detailed in the various **Disease Strategies** are appropriate for the characteristics of each disease, and can differ from a foot-and-mouth disease response.

The nature and level of welfare risks will depend on the control and eradication strategy for the particular disease – for example, the extent and nature of movement restrictions. Although there will be many fundamental welfare principles common to all EAD scenarios (provision of adequate food, water, space, etc), different and innovative strategies may be required to achieve acceptable welfare outcomes.

1.3.2 Other effects

Movement restrictions, together with an inability to dispose of animals and products, can create significant financial losses for owners, and possibly reduce cooperation with the response effort. These financial pressures might exacerbate the welfare situation. Poor animal welfare, caused by the disease, could also contribute significantly to an owner's emotional stress. At a broader community level, the slaughter of large numbers of apparently healthy stock is likely to cause serious public concern and attract intense media attention.

During the 2001 animal disease outbreaks in the United Kingdom and the Netherlands, the cost of 'welfare slaughter' of noninfected animals (that is, slaughter of animals on welfare grounds alone) represented a significant proportion of the overall cost. The implementation of appropriate animal welfare strategies, including supervised movements based on sound risk assessment, should significantly reduce the cost of welfare slaughter.

1.4 Responsibility for animal welfare in an EAD outbreak

1.4.1 Livestock facilities

Good husbandry procedures are paramount in all facilities where livestock are kept during production, including properties, transport facilities, saleyards and abattoirs. In an EAD response, when everyone is under stress, it is especially important to maintain high standards of stockmanship and provide adequate labour to meet the animals' health and welfare needs. As far as practicable, experienced workers should not be diverted to other work. Normal animal husbandry programs should be adjusted to deal with the particular circumstances and restrictions imposed by the emergency.

Everyone handling livestock should be especially alert for any unusual signs that might indicate disease, including reduced feed intake.

Properties

Regardless of whether there is an emergency, the owner or custodian of animals has primary responsibility for their welfare. When an IP site supervisor is appointed, that person will assume responsibility for management of all operations on that property to eradicate the emergency disease. It is expected that the IP site supervisor and property owner will work together to achieve the most acceptable animal welfare outcomes. During all phases of an EAD response, all field personnel should be aware of the importance of animal welfare and report any concerns to the AWO; this will usually be via a premises situation report. On properties within the restricted area (RA) in particular, field surveillance teams and field patrols should be alert to potential animal welfare problems. Members of the public should also be encouraged to report any situations of substandard animal welfare, such as neglect of agisted animals.

Particular attention should be paid to livestock held on small rural or semi-urban properties ('hobby farms'), where the handling facilities and/or feed reserves might be inadequate. In such situations, stockmanship and husbandry might also be deficient.

Transport operators

Different animal species are transported under a wide range of conditions. The driver usually has primary responsibility for the welfare of the animals temporarily under his or her care. Section 5 provides further details on animals in transit.

Saleyards and abattoirs

At a saleyard or abattoir, in normal circumstances, the manager effectively becomes the custodian of animals as they are unloaded, although every worker should also accept personal responsibility for the proper treatment of the animals. During an EAD response, a site supervisor may be appointed to control saleyard activities, and this person will then work with the saleyards or abattoir manager to achieve the best animal welfare outcomes in those circumstances.

1.4.2 Local disease control centre

At the LDCC, the AWO is responsible for compiling and assessing information about animal welfare from identified high-risk premises in the RA. In collaboration with the industry liaison officer (ILO) and, when appropriate, the IP site supervisor, the AWO will prepare and update a welfare action plan targeting premises seen as potentially high welfare risks. The AWO will provide appropriate advice and guidance to the planning manager regarding welfare issues.

Further details on the responsibilities of the AWO and other LDCC personnel are in Section 3.2.

1.4.3 State/territory disease control headquarters

At the SDCHQ, the animal welfare coordinator (AWC) is responsible for monitoring animal welfare across the control area (CA) and other parts of the state or territory outside the RA. The AWC's primary role is liaison on animal welfare issues with other government agencies, industry bodies and animal welfare organisations at a state level. It might also be appropriate for the AWC to liaise with national organisations, and to assist in handling media enquiries. The AWC may be able to assist the LDCC Animal Welfare Panel (see Section 3.2.5) and contribute to its deliberations.

The AWC should have a well-developed state and national network to assist the key liaison role of this position.

1.4.4 State/territory animal welfare unit

The animal welfare unit of the relevant state or territory government agency will be expected to act through the SDCHQ to provide support and guidance to the EAD response. It would be desirable for the AWC to be a senior officer seconded from the animal welfare unit.

1.4.5 Animal welfare organisations

In several jurisdictions, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) plays a significant role in the administration and policing of animal welfare legislation. During an EAD response, the RSPCA's resources, provided through the LDCC and/or the SDCHQ, could be valuable.

It is important that any regulatory action to deal with an animal welfare matter does not interfere with the disease eradication program.

2 Existing animal welfare standards

Within the Australian community, and the livestock industries in particular, animal welfare is regarded as a key component of modern animal production. Welfare problems can be caused by complacency, lack of skills or knowledge, or a failure to treat animals humanely and as sentient beings for which humans have an ethical responsibility. This can also apply to dogs, cats, horses and other species kept as companion animals or for various working or recreational purposes.

Requirements and standards for animal welfare are set out in various legislative instruments, and are now also incorporated in most industry quality assurance schemes, including those covering feedlots, saleyards and transport.

2.1 State and territory legislation

Legislative responsibility for animal welfare rests primarily with state and territory governments, all of which have their own acts and regulations. These are listed in Appendix 3, together with their URL links.

The Australian Government has responsibility for trade and international agreements, and its legislation covers the welfare of animals exported live or processed at export abattoirs.

During an emergency animal disease (EAD) response, any action taken on welfare grounds alone must comply with the provisions of the animal welfare legislation in the relevant jurisdiction. The animal welfare officer (AWO) and animal welfare coordinator (AWC) should have copies of the appropriate legislation readily available for reference.

2.2 Australian Animal Welfare Strategy

The Australian Animal Welfare Strategy was developed by the National Consultative Committee on Animal Welfare and approved by the Primary Industries Ministerial Council in May 2004. The introduction states:

The Australian Animal Welfare Strategy has been developed to provide the national and international communities with an appreciation of animal welfare arrangements in Australia and to outline directions for future improvements in the welfare of animals.

It embraces a broad vision for the humane treatment of all sentient animals and provides a framework for sustainable improvements in animal welfare outcomes, based on scientific evidence and social, economic and ethical considerations. It reflects the high regard Australians place on the value, care and the well-being of animals.

In addition, the strategy sets out the roles and responsibilities of animal owners/custodians, key industry and community organisations, and government agencies in addressing various welfare issues, such as those that might occur during an EAD response.

The Australian Animal Welfare Strategy is available on the Australian Department of Agriculture, Fisheries and Forestry website.¹

2.3 Model codes of practice

Under the sponsorship of the Primary Industries Ministerial Council, a series of *Australian Model Codes of Practice for the Welfare of Animals* has been prepared. These guidelines describe acceptable levels of animal care. They are adopted throughout Australia, either directly by reference in legislation or indirectly in the development of state and territory codes that meet specific regional needs.

The model codes of practice also provide a basis for animal welfare standards in various industry quality assurance programs and locally based codes for animal management and animal control. The model codes are reviewed periodically to include advances in animal welfare science, changing community expectations and evolving industry practices.

The model codes are a useful reference for welfare issues during an EAD response. One or more may be relevant to a particular EAD situation, depending on the species affected. The AWO and AWC should ensure that the relevant codes are readily available at the local disease control centre (LDCC) and state or territory disease control headquarters (SDCHQ).

The 22 codes published to date are:

- Animals at Saleyards (1991)
- Buffalo, Farmed (1995)
- Camel (1997)
- Cattle (2004)
- Cattle, Land Transport of (1999)
- Deer, Farming of (1991)
- Emus, Husbandry of Captive-Bred (1999)
- Feral Animals, Destruction or Capture, Handling and Marketing of (1991)
- Goat (1991)
- Horses, Land Transport of (1997)
- Livestock, Air Transport of (1986)
- Livestock, Rail Transport of (1983)
- Livestock, Road Transport of (1983)
- Livestock, Sea Transport of (1987)
- Livestock at Slaughtering Establishments (2001)
- Ostriches, Farming of (2003)
- Pig (1998)

¹ <http://www.affa.gov.au/content/output.cfm?ObjectID=3C9C4ACE-B85B-465C-9C508C771F08C87E&contType=outputs> (Accessed 12March 2007)

- Pigs, Land Transport of (1997)
- Poultry, Domestic (2002)
- Poultry, Land Transport of (1998)
- Rabbits, Intensive Husbandry of (1991)
- Sheep (1991).

The codes are available from CSIRO Publishing.²

2.4 Industry quality assurance programs

During the past 20 years, various quality assurance programs have been developed and implemented in the livestock industries to meet consumer expectations for high-quality products and acceptable animal welfare outcomes. This type of industry self-regulation is an important and complementary component of the overall regulatory framework, and has contributed to a significant improvement in welfare standards in a number of animal industries.

2.5 Animal welfare organisations

Throughout Australia, a range of non-government organisations represent the wide spectrum of views about animal welfare and ways to improve it. The RSPCA, in particular, has significant networks in each state and territory, as well as international links. In several jurisdictions, in addition to its lobbying role, the RSPCA has formal responsibility for assisting in the enforcement of animal welfare legislation.

During an EAD response, it is essential that good communications are maintained between the SDCHQ, LDCC and RSPCA, especially if there is a possibility that action to enforce animal welfare legislation will compromise disease control and eradication activities.

2.6 International trade

Australia is a major exporter of animal products and live animals. Interest has recently increased in various welfare issues associated with livestock production and transport. International bodies such as the World Trade Organization and the OIE (World Organisation for Animal Health, formerly Office International des Epizooties) are encouraging the development of standards and guidelines that are likely to have significant implications for livestock production. Australia has been actively engaged in establishing and promoting national benchmarks for animal welfare and has taken a leading role in relevant international forums.

² <http://www.publish.csiro.au/nid/22/sid/11.htm>.

3 Management of animal welfare

During the Investigation Phase and the Alert Phase of an emergency animal disease (EAD) response, there will usually be no specific animal welfare concerns and no need for animal welfare personnel to be appointed. If a welfare issue arises during these early phases, the chief veterinary officer (CVO) should be able to call on animal welfare expertise in the relevant jurisdiction.

When the presence of an EAD agent is confirmed and the Operational Phase of AUSVETPLAN is activated, the state or territory disease control headquarters (SDCHQ) and the local disease control centre (LDCC) will be established. An animal welfare officer (AWO) will be appointed at the LDCC and an animal welfare coordinator (AWC) at the SDCHQ. These appointments will be made by the SDCHQ director and/or the LDCC controller.

3.1 State/territory disease control headquarters

The AWC is located in the Planning Section of the SDCHQ, and is responsible to the planning manager. The primary role of the AWC is liaison and coordination at a national level, across the state or territory, and within the control area (CA) in particular.

3.1.1 National liaison

The Consultative Committee on Emergency Animal Diseases (CCEAD) will be informed about any significant animal welfare matter in reports provided by the CVO, based on briefings by the AWC.

Depending on the disease and the extent of the outbreak, it would also be helpful for the AWC to maintain liaison with various national groups as appropriate, including:

- animal welfare units in other government agencies (national and state or territory);
- national industry bodies;
- the Australian Veterinary Association; and
- RSPCA Australia.

3.1.2 State liaison

There will be intense activity at the LDCC during an EAD response, and the AWO is likely to be preoccupied with compiling and assessing information, prioritising welfare issues and drawing up action plans. The AWC should provide appropriate support by obtaining information on particular welfare issues. Importantly, the AWC should assist the public relations manager in responding to any media enquiries about animal welfare. As far as possible, the AWO should be shielded from this additional task.

It is imperative that clear lines of communication are maintained with animal welfare organisations such as the RSPCA, to ensure that any routine enforcement activity by such organisations does not interfere with the disease eradication program.

The AWC will prepare reports on animal welfare issues for the planning manager and appropriate distribution. Further details are in the **Control Centres Management Manual** (Part 1).

3.2 Local disease control centre

During the early stages of an EAD response, limited and sometimes unreliable information, changing market conditions and compressed timelines can create a sense of panic and uncertainty. From the outset, a recognised infrastructure to respond to animal welfare concerns will be needed. The AWO is the key person who will address these concerns in the first instance and coordinate appropriate responses at the local level. If required, the AWO also will provide training as part of the staff induction process.

3.2.1 Inventory

At the LDCC, drawing upon existing lists and information as much as possible, the AWO will compile an inventory of available resources that might be used in dealing with animal welfare, including:

- abattoirs – within the CA, but within reasonable travelling time of the restricted area (RA);
- knackeries, pet food processors, mobile abattoirs;
- any other facilities that might be used for emergency slaughter (eg pet food processors);
- any potential sources of alternative feedstuffs (eg feed mills, food processing plants);
- any empty or unused animal holding facilities, public or private saleyards, etc;
- properties with agistment capability and availability;
- livestock transport companies;
- personnel with animal welfare expertise located within the RA (eg welfare organisations and gazetted or retired animal welfare inspectors);
- species specialists (eg nutritionists, specialist stock-workers) in departments of agriculture, CSIRO, universities and private enterprise; and
- assistance available from the state/territory animal welfare unit.

Contact details for all abattoirs, feed mills, transporters, saleyards, personnel, etc should be compiled and readily available. Copies of all relevant legislation, codes of practice and welfare standards should also be readily available.

Wherever possible, consistent with sound risk management, animals will be permitted to be sent for (salvage) slaughter at abattoirs in the declared CA. Although the product may have reduced commercial value, this will lessen the

overall financial cost of the outbreak. Importantly, it should reduce the occurrence of welfare problems. Therefore, for an EAD response involving major farmed species, it is highly desirable that suitable slaughtering facilities are included within the CA.

3.2.2 Monitoring

As field surveillance teams begin submitting property reports, and this information is entered into the Animal Health Emergency Information System (ANEMIS), the AWO will contribute to Planning Section situation reports, focusing on animal welfare. The welfare reports will be based on:

- ANEMIS data;
- reports from field teams and IP site supervisors;
- meteorological forecasts; and
- information from owners/managers and the public.

The AWO will work closely with the industry liaison officer (ILO) in monitoring and assessing this information, while keeping abreast of disease eradication and control activities. These activities must take precedence, and any proposed welfare actions will be planned with this in mind. In collecting information about premises, there should be **minimal duplication of effort**, to make best use of resources and to reduce movements between properties.

Based on information from property owners, surveillance teams and other sources, the AWO will monitor the animal welfare situation across the RA, especially for intensive industries and properties where movement restrictions are causing difficulty. A priority action list will be developed, focusing primarily on those properties that are identified as high risk. This list will be updated as information arrives, taking into consideration:

- severity/level of welfare risk;
- incoming reports;
- disease eradication activities;
- availability of slaughtering facilities;
- movements of animals or feed under permit;
- weather conditions;
- management options available for individual properties; and
- logistical factors.

3.2.3 Management options

The AWO will provide advice and guidance to IP site supervisors, owners or managers of premises where there appears to be a welfare risk, recommending action to prevent welfare being compromised, wherever possible. Additional expertise (eg nutrition or species specialists) may be utilised, as necessary. In close consultation with the ILO and site supervisor, the AWO will also explore management options for each property. Options might include:

- sourcing additional or unconventional feedstuffs;

- use of other areas of the property, such as temporary yards;
- agistment within the RA;
- movement under permit outside the RA for sale or slaughter (depending on the particular circumstances); and
- partial or total culling by:
 - movement under permit to an abattoir
 - salvage slaughter at a knackery or pet food processor
 - on-farm welfare slaughter, as a last resort.

Any recommendations will be passed to the IP site supervisor for appropriate action. The AWO must not advise any action regarding a particular property, unless prior approval has been given by the restricted area movement and security manager (eg for movements outside the restricted area).

3.2.4 Action plan

Depending on the species and the key animal welfare criteria, monitoring information will be compiled into a welfare action plan for the RA. The welfare action plan will identify potential welfare problems for particular premises and set out proposed actions in priority order. Priority welfare actions will be based on the relevant welfare criteria (limits) for each species as set out in the animal welfare alert tables in Section 4. If a significant animal welfare problem is identified, swift and decisive action is needed to address the matter. The 'rolling' action plan should focus on issues or situations that will require attention within the next 7 days. (With some intensive industries, it might be possible to extend the 7-day horizon.) With the agreement of the ILO and the restricted area movement and security manager, this system should allow sufficient time to make the necessary logistical arrangements.

When a potential animal welfare problem is identified for a particular premises, the AWO, in consultation with the ILO and site supervisor, will draw up an animal welfare plan for those premises. As far as possible, this plan should be consistent with the wishes of the owner or manager, who will be asked to sign off on the proposed action. In compiling the plan, the AWO might enlist the expertise of relevant nutritionists or species specialists – for example, in devising appropriate emergency feeding programs.

However, if the owner is not in agreement, it might be necessary for a person with relevant legislative authority to issue a formal notification and proceed to implement the action, if this is consistent with the provisions of the state/territory legislation for animal welfare. Alternatively, the owner should be formally notified of the deteriorating welfare situation and appropriate monitoring instituted.

While there will inevitably be competing demands for limited resources at the LDCC, in many situations welfare-related actions can be implemented using existing personnel and resources. If this is not possible, it might be necessary for the AWC to arrange additional support.

3.2.5 Animal Welfare Panel

If a particularly difficult or complex welfare issue arises in the RA, the AWO will recommend that the planning manager convene the Animal Welfare Panel,

comprising the AWO, AWC, ILO, IP site supervisor, LDCC controller or delegate, and the planning manager. If necessary, additional people with appropriate expertise (eg recognised animal welfare expertise or species knowledge) might be co-opted to the panel. The panel will adjudicate on any disputes or disagreements and attempt to resolve them. If that is not possible, the matter will be referred to the SDCHQ via the AWC.

If a serious welfare problem directly attributable to government action or directions arises and cannot be resolved at a local level, the Animal Welfare Panel may choose to report directly to the CVO.

3.3 Forward command post

The appointment of an AWO at a forward command post will only occur if animal welfare is identified as a significant problem in that particular area. In most circumstances, the AWO at the LDCC should be able to provide advice and deal with welfare matters in the area controlled by the forward command post.

3.4 Infected, dangerous contact and suspect premises

Owners and managers of properties in the RA will be required to comply with various directions related to the disease control plan, and field surveillance teams and other personnel will be responsible for completion of those actions. At the same time, the AWO will provide appropriate advice and assistance, aimed at avoiding the development of any welfare problem.

In general, whatever the disease status of the premises, the owner or manager is primarily responsible for the welfare of all animals under their control. Where an IP site supervisor is appointed, that person will assume responsibility for animal welfare. In the event of any impending welfare problem, the owner/manager will be expected to cooperate with the AWO, site supervisor and ILO to arrive at an acceptable plan that avoids the problem.

4 Animal welfare — species considerations

A wide range of animal species may be affected by an emergency animal disease (EAD) outbreak, and potential threats to animal welfare will differ markedly between species. In the uncertain climate of an animal disease emergency, when events are unfolding rapidly, it is important that animal husbandry strategies are adjusted appropriately. Timely changes to animal management should result in the best possible welfare outcomes.

For quick reference, an ‘animal welfare alert’ has been included in this section for most species, listing welfare problems that might occur during an EAD incident. Appropriate minimum requirements and suggested remedial actions are also included.

4.1 Cattle and buffalo

Cattle are kept in diverse situations, including extensive pastoral properties, dairy farms and beef feedlots. The basic needs of cattle — food, water, shelter, etc — must be met. Importantly, people handling the cattle must be competent and able to use the animals’ natural behaviour to work them so as to minimise stress. Good workers are flexible in their approach to cattle management and handling, and are able to adapt to the needs of particular cattle and circumstances.

The disease of greatest concern for the cattle and buffalo industries is foot-and-mouth disease. However, an outbreak of bluetongue, Rift Valley fever, screw-worm fly or rinderpest (especially in *Bos taurus*) would also be of major significance. Response plans for each of these diseases are set out in the relevant **Disease Strategy**.

In an EAD outbreak, the animal welfare implications are likely to be very different for the various types of cattle husbandry. This section places emphasis on the more intensive systems — beef feedlots, dairies and calf rearing — where the risk of infection and the potential for animal welfare problems are greater. The welfare of cattle in transit is considered in Section 5.

4.1.1 Beef feedlots

Background

During the past 40 years, the feedlot industry has expanded to the stage where grain-fed beef now accounts for approximately 40% of beef production in Australia.

Feedlot enterprises usually fall into one of the following categories:

- large, sophisticated operations, where fattening, slaughtering and marketing elements are integrated;
- ‘contract feeders’, who own the facilities and feed and fatten cattle to the owners’ requirements for particular markets;

- opportunity feedlots, used to fatten stock when store prices are low and finished (fat) prices are high; or
- drought management facilities.

In an EAD, ownership of the cattle is important in the context of compulsory destruction and compensation payments. However, it is clearly the owner/manager of the feedlot who has responsibility for decisions and actions involving animal welfare, except where a site supervisor has been appointed.

Because of their size and throughput, the large commercial enterprises usually represent a higher risk of disease and welfare problems. However, smaller opportunity feedlots can also pose welfare problems because of their use of less experienced workers, smaller feed reserves and/or lack of contingency plans.

Feeder cattle are purchased from a wide range of markets, depending on prevailing market prices and availability. Cattle may be sourced from distant locations, and interstate movements are common. Cattle are fed under varying regimens, typically from 70 to 300 days. The feeding period depends on market destination; the domestic market requires shorter periods on feed compared with export markets.

On arrival at the feedlot, cattle are usually allocated to particular pens, where they remain during the feeding period. Most then go direct to slaughter, but smaller numbers are exported live for further feeding or sold through saleyards.

Table 1 shows the minimum requirements and suggested actions for 'animal welfare alerts' in beef feedlots.

Guidance documents

The establishment of the National Feedlot Accreditation Scheme (NFAS), a quality assurance system for industry self-regulation, has complemented the *National Guidelines for Beef Cattle Feedlots in Australia*.³ These guidelines provide a detailed framework for sound, responsible industry development. As part of NFAS requirements, most feedlots have an Animal Care Statement, which incorporates a specific health management program.

The *Model Code of Practice for the Welfare of Animals – Cattle* incorporates the Australian code for the welfare of cattle in beef feedlots. The code provides general advice on management practices in feedlots, some of which may be affected by an EAD response. For example, routine feeding, manure removal or health inspections may be disrupted because of higher priority activities.

The *Australian Standards for the Export of Livestock* (DAFF 2005) include a widely accepted system for body condition scoring (Appendix 1.1), maximum water deprivation times (Appendix 2.1), loading densities for land transport (Appendix 2.2) and minimum pen densities for cattle exported by sea (Appendix 4.1). This useful information is available on the DAFF website.⁴

³ <http://www.publish.csiro.au/nid/22/pid/114.htm> (Accessed 12 March 2007).

⁴ <http://www.daff.gov.au/livestockexportstandards> (Accessed 12 March 2007)

General management

In normal circumstances, numbers of cattle purchased roughly equal the numbers turned off at any particular time. Usually, an entire pen of cattle leaves the feedlot at one time. In a large enterprise, consignments can arrive and leave almost daily.

The rate at which cattle are delivered to the feedlot should never exceed the capability of facilities and staff. In the event of an outbreak or suspicion of an EAD, it is likely that purchasing will be halted, at least until the extent of the disease outbreak is clarified.

Manure disposal is an important part of good feedlot management. Manure is often scraped towards the centre of each pen and formed into a temporary mound. Later, it is transferred to a stockpile and disposed of as fertiliser.

There are occasional deaths in any feedlot. The procedure for routine carcass disposal should be included in the Animal Care Statement for each feedlot.

Each feedlot should also have an environmental management plan that includes quality control provisions for:

- regular clearing of manure and spilled feed from under fences;
- suppression of dust, and fly and insect pest populations;
- periodic removal of manure from pens, at least after removal of each draft of cattle;
- suppression of odours from effluent; and
- monitoring of environmental conditions.

As well as ensuring acceptable environmental conditions, these activities benefit animal welfare; they should not be neglected during an EAD response.

Feed

Feedlots require large quantities of feed daily; growing cattle consume 3% of their bodyweight (dry matter equivalent) each day. Animals are fed daily, and twice daily at many feedlots. A variety of feed commodities are sourced locally, but are often combined with regional and/or interstate supplies.

Feedlot rations typically include grain, hay, silage, molasses and a mineral/vitamin supplement. To allow time for cattle to adapt to the high-energy, high-protein diet, feedlots often use a 'stepped' feeding regimen. The grains used are predominantly barley, sorghum and wheat. Tallow, obtained from abattoirs, is commonly used as a feed ingredient.

It is illegal to feed cattle any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds)

under any circumstances. Further information on this feed ban is available from Animal Health Australia.⁵

All diets should be nutritionally balanced to provide appropriate levels of protein, other nutrients and energy, and should be palatable. An appropriate diet achieves production, maintenance and health of the cattle, and ensures that digestive upsets are minimised.

All cattle should have access to fresh feed daily, and any stale or spoiled feed should be removed from the troughs, especially in wet weather. In an EAD response, the reserves and availability of feed will be a crucial issue. If feed is limited, it is better to reduce the daily ration (possibly to maintenance levels) than to withhold feed on some days to conserve supplies, which can result in engorgement by dominant animals and failure of 'shy feeders' to eat at all. Any changes to the feeding regimen must be made in gradual steps, to minimise digestive disorders. Well-conditioned animals (body score 5–6) can be more susceptible to sudden metabolic collapse with a sudden reduction in feed. The cattle should be closely observed, especially if there are adverse weather conditions or it is necessary to move animals around the feedlot.

If there are difficulties in obtaining feed from usual sources, a feedlot operator might be tempted to use unusual plant material or plant waste as fodder. However, there is a risk that such material could contain chemical residues or toxic plants. Careful checks should be made if the use of crop byproducts or plant waste (eg cotton trash, human food processing waste) is being considered.

Workers should closely monitor the feed consumption of all pens of cattle each day, especially after any period of food restriction, and report any variation to the feedlot manager.

Space and shelter

The stocking density for each pen will depend on the age, size, movement and feeding patterns of the cattle. In normal circumstances, the minimum space allocation should be 9 m²/head (2.5 m² for any cattle housed in sheds). In an emergency, these maximum densities should not be exceeded for more than 72 hours.

With high stocking densities, the accumulation of manure should be monitored to avoid a build-up of wet manure such that cattle have insufficient dry space to rest.

As far as practicable, cattle should be protected from extreme weather that predisposes them to cold or heat stress. During an EAD response, with higher stocking densities, care should be taken that animals are moved as little as possible.

Health management

As noted above, each feedlot should have an Animal Care Statement, which will include a specific health management program. All feedlot yard personnel should be trained, competent and thoroughly familiar with the health management

⁵<http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

program. In an EAD response, it is especially important that feedlots have sufficient experienced staff to maintain an acceptable level of health and welfare, seven days a week.

In a well-run feedlot, there will be continuous emphasis on health management, with especially close surveillance for the first month after arrival. All animals should be checked daily by experienced workers who ride or walk all pens using an established inspection routine. In an animal disease emergency, the careful daily inspection of all animals is critical.

During an EAD outbreak, any signs of feeding disorders should be reported immediately to the feedlot manager. Sick or injured animals must be removed immediately, placed in hospital pens for treatment in accordance with the established health management program, and examined by a veterinarian as soon as possible. Any unexplained clinical signs or deaths must be reported to the LDCC immediately.

Table 1 Animal welfare alert: beef feedlots

Problem	Minimum requirements	Suggested action
Feed shortage	Preferably daily feeding (even if amount is reduced) Maximum 48 hrs off feed	Feed changes in gradual steps, to maintenance level Watch fat animals — reduce feed levels more gradually Euthanase any emaciated (BCS 1) and/or recumbent animals
Water shortage	Continuous, especially in hot weather 35–80 L/day Maximum 24 hrs off water (where no other option is available) Salt content: maximum 5000 mg/L	Watch for signs of dehydration Rehydrate as soon as possible May increase gradually above this level, for short periods only
Lack of space	At least 9 m ² /head (pens); 2.5m ² /head (sheds) Maximum densities should not be exceeded for more than 72 hrs — animals must be closely monitored, especially in hot weather.	Thin out pens Move animals: <ul style="list-style-type: none"> • to another area of property • to sale/agistment on another property • to salvage slaughter

4.1.2 Dairy enterprises

Background

The Australian dairy cattle industry is based largely on perennial pastures, which are often irrigated. Spring pasture surpluses are conserved as silage and hay for feeding during autumn and winter, and some grain is fed.

Most dairy enterprises are well-organised, finely tuned operations where close attention is paid to the health and welfare of animals. The feeding and management of cows is designed to achieve maximum milk production, within the animals' genetic and physiological limits.

In an animal disease emergency, as far as possible, the daily routine should be maintained, with cows being milked twice daily. Careful management of the milking procedure and proper milking machine operation are essential to the welfare of dairy cows.

With its potential for rapid and extensive spread, foot-and-mouth disease (FMD) poses the greatest risk to the dairy industry. FMD virus may be excreted in the milk of infected cows for up to 4 days before the onset of clinical signs, and the virus may be carried from farm to farm on contaminated vehicles and clothing. If an outbreak of FMD is suspected on a dairy farm, milk collection is prohibited until the status of the property is determined. However, special procedures have been devised to allow the movement of raw milk from suspect properties under permit (see the **Foot-and-mouth Disease Strategy**). Therefore, for many dairy properties, it should be possible for cows to be milked and the milk picked up from the farm according to the normal pattern.

Table 2 shows the minimum requirements and suggested actions in dairy enterprises.

Feed

For body condition scoring of dairy cows, see *Weighing and Condition Scoring Replacement Heifers and Dairy Cows* (Moran and Kyabram 2006).

If normal feed supply arrangements are disrupted during an EAD response, it will be necessary to constantly assess feeding levels and herd numbers. Reducing stocking pressures by agistment or culling substandard cows for salvage slaughter (if available) might be considered. Whatever strategy is chosen, it is important to group stock according to feed priorities:

- Late-lactation cows partition feed to increase bodyweight rather than produce milk, and they should be maintained at a minimum condition score of 5–6.
- Forward springers should be fed to maintain at least condition score 5, to minimise calving problems.
- Backward springers in poor condition that are expected to calve within 2 months require supplementation to at least maintain weight. Cows in moderate to good condition should be held in this condition, or their ration reduced slightly. Stock with long dry periods can be fed to maintenance level.
- Unmated heifers will be the milkers after the emergency has passed. They should be fed a maintenance ration and left unjoined.
- Weaners should preferably not be fed at maintenance for an extended period. If possible, select a small group (for the future) that can be correctly fed to allow growth.
- Calves can be fed a milk replacer once they have received colostrum for the first 24 hours. They may be weaned from milk onto dry feed at 4–6 weeks provided they are eating about 0.75 kg of starter (high-protein) ration per day. Any weak calves that are unable to feed should be euthanased.

It is illegal to feed cattle any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds) under any circumstances. Further information on this feed ban is available from Animal Health Australia.⁶

Water

Dairy cows drink about 10 times per day, usually after feeding. Lactating cows will drink about 85–95 L/day, and dry cows about 40–50 L/day, but this will vary considerably depending on ambient temperature, diet and physiological state.

Space

On most dairy properties, space will not be a limiting factor in maintaining acceptable welfare standards. However, if it is necessary to move stock away from boundaries to create an effective buffer zone, the resulting higher stocking density might create some challenges for pasture management and feed availability.

Table 2 Animal welfare alert: dairy enterprises (adult cattle)

Problem	Minimum requirements	Suggested action
Feed shortage	Daily feeding is preferable for all classes of stock (even if total amount is reduced) Maximum 24 hrs off feed	Maintain daily dairy routine, including feeding, wherever possible Feed changes in gradual steps, to maintenance level
Water shortage	Continuous, especially in hot weather 85–95 L/day Maximum 12 hrs off water (where no other option is available) Salt content: maximum 3000 mg/L	Watch for signs of dehydration Rehydrate as soon as possible May increase gradually up to 6000 mg/L, for short periods only
Milking disrupted	Twice daily milking. Cows on low rations and/or lower-producing cows may be milked once daily.	Continue with normal dairy procedures, as far as possible Dry off poorer producing cows

4.1.3 Artificial rearing of calves

Background

In dairy enterprises, calves are commonly reared on artificial diets after early weaning. Bobby calves are usually slaughtered at less than 4 weeks of age for 'pink veal', whereas replacement heifers are grown to maturity. Young calves pose particular welfare risks, and in a disease emergency their husbandry should not be neglected.

⁶ <http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

Calves are social animals, and should be kept in groups, preferably of their own age and size. Young animals are particularly susceptible to climatic extremes, and adequate shelter should be provided.

Table 3 shows the minimum requirements and suggested actions for animal welfare alerts involving calves.

Bobby calves

A bobby calf is less than 4 weeks of age and must weigh at least 23 kg at time of slaughter. Because of their size and age, bobby calves are particularly sensitive to adverse conditions during handling or transport. A high standard of management and stockmanship is especially important. For example, personnel should have the ability to recognise early signs of distress or disease, so the cause can be identified and prompt remedial action initiated.

When an animal disease emergency is declared, there is likely to be considerable pressure on slaughtering capacity at abattoirs within the control area (CA), and livestock saleyards will not be operational. Before consigning any calves for slaughter, the owner must confirm that the abattoir will be able to process the animals within 24 hours of arrival.

If the calves cannot be processed in the normal manner, the owner must consider other options, including:

- rearing the calves on farm;
- sale to another property within the CA;
- agreement for rearing on a property within the CA;
- sale to a knackery or pet food processor; and
- humane destruction on farm.

Any sick or injured calves should not be presented for sale or transport, but should receive appropriate attention and treatment, or be humanely slaughtered.

All calves should be fed on the farm within 6 hours of transport for sale or slaughter, and transported directly from the farm to the destination in the shortest possible time.

When there is likely to be an extended delay before slaughter of calves at an abattoir, the abattoir management should:

- immediately inform buyers and any owners known to be consigning calves;
- redirect any calves in transit back to the property of origin or to an alternative abattoir if available;
- give priority to any bobby calves already in lairage;
- inspect all calves at least every 12 hours; and
- ensure that any calves held in lairage are fed with commercial milk replacer at least every 12 hours.

Dairy replacements and veal production

Replacement calves or those intended for veal production are fed milk or a complete milk replacer for the first few weeks of life, and it is important that this regimen is maintained. From 0–4 weeks, calves should have access to a concentrate ration of at least 20% crude protein and also some hay or pasture, to aid development of their digestive tracts. Calves will start to eat solid food after about 3 weeks and they can be weaned at 5–6 weeks. Water should be available *ad libitum*. Vealers are usually turned off at 3–4 months.

Table 3 Animal welfare alert: calves

Problem	Minimum requirements	Suggested action
Feed shortage	0–4 weeks: feed every 10 hrs, using balanced milk replacer; maximum 12 hrs off feed 5 weeks and older: high-quality hay, pellets, crushed grain, etc; maximum 12 hrs off feed	Euthanase any calves unable to be fed Consider options for remaining animals — see Section 4.1.3
Water shortage	Continuous, especially for older calves eating solid food 5–10 L/day Maximum 12 hrs off water (where no other option is available)	Watch carefully for signs of dehydration and weakness
Limited space	At least 2 m ² /head in pens Maximum density should not be exceeded for more than 48 hrs	Thin out pens Move animals: <ul style="list-style-type: none"> • to another area of property • to sale/rearing on another property • to salvage slaughter.

4.1.4 Extensive beef production (grazing)

Background

In the event of an animal disease emergency, the major immediate impact on the extensive beef industry will be loss of market access. Movement restrictions and suspension of export markets will mean that finished animals will have to be held on properties, perhaps for extended periods. The adverse effects of such restrictions will be exacerbated if there are also unfavourable weather conditions, such as drought. In such uncertain conditions, owners will need to conserve limited feed reserves. Some of the circumstances and available options for managing stock will parallel those existing during a drought, especially the feeding strategies.

Table 4 shows the minimum requirements and suggested actions for animal welfare alerts in beef grazing enterprises.

Feed

For body condition scoring of beef cattle, see Appendix 1.1 of the *Australian Standards for the Export of Livestock* (DAFF 2005).

If producers are forced to hold stock for extended periods, feed might become a limiting factor. If it is necessary to purchase feed at a time when cash flows are

uncertain, owners might be tempted to use cheaper unconventional feedstuffs or feed from unknown sources. Careful checks should be made to ensure that the feed is free from harmful residues or toxic substances, especially as their effects will be magnified in stock that are in poor condition.

If there is plenty of dry feed available, supplementary feeding will allow the animals to make better use of the paddock feed. The appropriate supplement must be chosen, to make up for the main deficiencies of the paddock feed. Dry paddock feed is often deficient in protein and sulphur, which can be provided in supplements such as cottonseed or linseed meal. Where there is short green feed, low energy intake is the main problem, and grain feeding will be more beneficial.

If there is insufficient pasture for livestock maintenance, it might be necessary to consider hand feeding. Any supplementary feeding or hand-feeding program should be carefully planned and managed to achieve the best outcome. Producers should obtain relevant information from their department of agriculture.

It is illegal to feed cattle any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds) under any circumstances. Further information on this feed ban is available from Animal Health Australia.⁷

Different classes of stock should be fed and managed according to need:

- Heifers should be withheld from joining.
- Joined cows should be pregnancy tested, and empty cows sent to slaughter, if this is permitted and abattoir facilities are available. Otherwise, they should be fed to maintenance.
- Pregnant cows need special attention. With restriction of feed, there can be a higher incidence of dystocias (abnormal births), retained placentas and metabolic disorders.
- Calves should be weaned as early as possible, from 3 months of age onwards, and fed separately from the cows. Consider salvage slaughter, if this is permitted and available. Calves are the most difficult stock to feed and, if owners decide to keep them, they should be fed a production ration with adequate protein levels; commercial calf pellets or a suitable grain/roughage starter ration are preferable.

Space

On most beef properties, space will not be a limiting factor in maintaining acceptable welfare standards. However, in more closely settled areas, if it is necessary to move stock away from boundaries to create an effective buffer zone, the resulting higher stocking density might create some challenges for pasture management and feed availability.

⁷ <http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

Table 4 Animal welfare alert: extensive beef (grazing) enterprises

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 48 hrs off feed Adults can survive on small amounts of low-quality forage	Closely assess animals of BCS 1–2. Euthanase any weak, recumbent animals. Watch fat (BCS 4–6) animals — susceptible to sudden metabolic collapse. Young animals can deteriorate quickly — give best feed available.
	Lactating cows may dry off	Wean at 3 mths onto good quality roughage and creep feed
	Calves: feed every 10 hrs	Euthanase any calves unable to be fed (if cannot feed in 24 hrs)
Water shortage	Weaners: 25–50 L/day Dry stock (400 kg): 35–80 L/day Lactating cows (pasture): 40–100 L/day Lactating cows (saltbush) 70–140 L/day Ambient temperature and lactation status greatly affect demand Maximum 24 hrs off water (where no other option is available)	Watch carefully for signs of dehydration and weakness, especially young or lactating stock After period of deprivation, reintroduce water gradually
	Salt content: maximum 5000 mg/L	May increase to 10 000 mg/L gradually, for short periods only

4.1.5 Buffalo

Water (swamp) buffalo were introduced to northern Australia in the 1820s and colonised the coastal flood plains, where the feral population was then harvested for meat and hides. Following the destruction of much of the feral herd in the 1980s for the control of brucellosis and tuberculosis, a new industry based on farmed stock emerged. Water buffalo are currently being produced in all states except Tasmania in small numbers, and in substantial herds in the Northern Territory.

In the 1990s, riverine buffalo — the larger dairy breed of India and Pakistan — were imported from the United States, Italy and Bulgaria for cheese production, and also for crossbreeding with water buffalo to produce a faster growing meat animal.

Water buffalo can adapt to a wide range of climatic conditions, including the colder months in temperate areas of Australia, provided there is adequate shelter. They have similar pasture and feed requirements to cattle except that they are better able to utilise low-quality roughage. They are also adapted to poorer, wetter pasture areas and consume a wider range of fodder species than cattle, performing well on crop stubbles and byproducts of grains and legumes. In temperate areas during late winter and spring, when pastures are green and highly digestible, supplementation with hay might be necessary.

Buffalo are very similar to cattle in their husbandry requirements and they are susceptible to the same range of diseases, including foot-and-mouth disease. Although they become very docile when handled frequently, buffalo can become aggressive if pushed hard, especially in unfamiliar surroundings. Dogs should not

be used, especially if calves are in the herd. Buffalo have fewer sweat glands than cattle and, in hot conditions, can succumb to heat stress if driven long distances. They require adequate shade.

The minimum requirements and suggested actions for animal welfare alerts in beef grazing enterprises (Table 4) also apply to buffalo.

4.2 Sheep

Background

The Australian sheep industry has undergone significant structural adjustment in response to a decline in demand for wool and consequent low prices. Simultaneously, there has been strong growth in meat export markets, especially to the United States, Europe and Asia. As a result, the historical dominance of wool in the industry is now being overshadowed by sheep meat production, often combined with cropping.

Approximately 44% of sheep producers derive significant income from prime lamb sales; the remainder have a diversified mix of cropping, wool, lamb and beef activities.

In many areas, the sheep industry can be severely affected by drought, and this might be an important consideration during an EAD response because animal welfare is already at risk under drought conditions. Further intensification of the industry could further increase the level of risk to animal welfare.

The major disease threats to the sheep industry are foot-and-mouth disease, sheep pox, bluetongue and screw-worm fly. Each would cause substantial production losses, loss of international markets and disruption for rural communities. Response plans for each of these diseases are set out in the respective **Disease Strategies**.

Apart from assembly depots for live sheep exports, feedlots for prime lamb and fine wool production, and a few specialised sheep dairy enterprises, most of the sheep industry is based on the grazing of extensive rangeland or improved pastures. The geographical dispersal of sheep properties will be a significant advantage in dealing with an EAD outbreak. When an outbreak is confirmed, the main welfare issue will be the need to hold stock on farms for prolonged periods, at a time when the stock's value is probably falling. As in a drought, it is the responsibility of the owner or manager to ensure that the basic requirements for the welfare of the sheep are met, including:

- adequate nutrition to maintain good health;
- sufficient potable water;
- protection from predators;
- protection from pain, injury and disease; and
- adequate shelter from extremes of weather.

On most sheep properties, space will not be a limiting factor. The main challenge for the owner will be to manage the different classes of stock and the available feed

to ensure survival of the farm business enterprise when the emergency has passed. The quality of husbandry and managerial competency will be critical.

Table 5 shows the minimum requirements and suggested actions for animal welfare alerts in sheep enterprises.

Routine husbandry

A normal health program for most sheep properties will include a range of management and prophylactic measures. During a disease emergency, the routine preventive measures for parasites, flies and endemic diseases should be maintained as far as possible. Neglect of certain husbandry procedures and treatments (shearing, dipping, tailing/castration, flystrike protection, etc) can result in additional pain and distress.

Owners and managers should ensure that sheep are inspected by experienced workers often enough to maintain the sheep in healthy condition. Pasture quality, watering facilities and fences should also be checked. Sheep in feedlots should be inspected daily, especially for any changes in feed and water consumption, signs of illness or distress.

Ewes that are lambing under grazing conditions should be in a sheltered paddock and disturbed as little as possible. In most situations, Merino ewes should be left alone, to prevent mismothering. However, other mobs should be under adequate surveillance to ensure that any dystocias (abnormal births) receive appropriate attention.

Feedlots

Feedlotting, where sheep are kept in outdoor yards or sheds and hand-fed, is used to prepare sheep for live export, in meat lamb production and in fine wool production. All feedlot sheep should have adequate access to feeding and watering facilities, which should be maintained in good repair and clean condition.

For recommended space allocations, see Standard 3 of the *Australian Standards for the Export of Livestock* (DAFF 2005).

Feed

For body scoring of sheep, see Appendix 1.1 of the *Australian Standards for the Export of Livestock* (DAFF 2005) and *Body Condition Scoring of Sheep and Goats* (Suiter 2006).

In most situations, pasture provides the most cost-effective source of nutrients for sheep. There is considerable seasonal variation in pasture characteristics, especially the herbage mass, digestibility and species composition (eg legume content). These are the most important factors in determining the overall value of pasture for sheep production or survival.

A related management issue is preferential grazing by sheep, which can deplete or even eliminate highly preferred pasture species. In an emergency, when heavier stocking rates might be necessary, the grazing program should aim for the long-term stability of the pasture.

By using predictions of pasture growth rate and actual intake during an EAD response, a competent manager should be able to determine appropriate stocking rates and fodder budgeting. If heavier stocking rates cause the pasture mass to fall to unacceptable levels, supplementary feeding might be necessary.

Supplementary feeding

If pasture is likely to be limited, supplementary feeding should begin while pasture is still available. The types and qualities of supplementation will be many and varied, but it is important that the appropriate balance between energy and protein is maintained. In selecting the best option, several factors should be considered, including the condition of the sheep, the quantity and quality of pasture on offer and the supplementary feed that is available.

If the sheep have not previously been hand fed, it is advisable to include some experienced sheep in the mob to encourage the inexperienced animals to feed. Untrained sheep should be fed initially in small paddocks. It is important to monitor the feeding program – sheep in full wool often look in much better condition than they really are, and it is essential that body condition is assessed by manual palpation.

During an EAD response, the management of pregnant and lambing ewes will be difficult, especially if the available pasture and/or supplementary feed are limited. Breeding stock should be maintained at condition scores of at least 2 and preferably 3, particularly if animals are exposed to climatic extremes. Pregnant ewes require special attention if neonatal mortalities are to be avoided. Growth of the foetus accelerates during the final 6 weeks of pregnancy, and the feeding rate should be increased accordingly.

Ewes should be moved into lambing paddocks well before lambing. A maximum stocking density of approximately 18 ewes per hectare is acceptable, preferably in small mobs. Higher densities can cause mismothering.

For supplementary feeding in an emergency, dry and pregnant stock should be concentrated into smaller paddocks (about 700 sheep per hectare) or feedlots. Besides aiding acceptance of the feed, this could free lambing paddocks to allow improved pasture growth. At best, this may avoid the need for hand feeding during lambing, thus reducing the incidence of mismothering, which is a common problem in this situation.

Lambs should be fed grain and hay supplements while still on their mothers. If lambs are not 'trained', it will take up to 3 weeks to bring weaners onto adequate quantities of hay or grain, during which time substantial weight loss and deaths may occur. Weaners require high-quality rations but have relatively low intake. They should reach 20 kg bodyweight by 6 months of age, and then it is acceptable to reduce feeding rates to maintenance level. Roughage should be incorporated into the ration early in the post-weaning phase.

Often, a proportion of sheep and lambs will not adapt to supplementary feeding. If possible, these 'shy feeders' should be removed and fed separately.

Helpful information about sheep nutrition and feeding strategies is available from local departments of agriculture.

It is illegal to feed sheep any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds) under any circumstances. Further information on this feed ban is available from Animal Health Australia.⁸

Water

Sheep must be provided with adequate supplies of water, of a quality that can sustain good health. If it is necessary to use water sources of marginal quality, the animals should be closely monitored for possible deleterious effects. Windmills, bores, troughs and dams should be inspected regularly, especially in hot weather.

No sheep should be deprived of water for more than 36 hours, or for more than 12–24 hours in hot weather.

Drought

If a disease emergency occurs during a drought or when drought appears imminent, managers must immediately adjust their drought relief strategies. In these circumstances, managers with limited experience should seek specialist guidance.

Sheep already being fed for survival should be closely observed at feeding time. Weak or recumbent animals should be euthanased as soon as possible. Under no circumstances should animals be allowed to starve to death. Where minimal feed and water requirements cannot be provided, the options will be:

- salvage slaughter, if permitted and processing facilities are available;
- agistment within the CA, if permitted; and
- sale within the CA, if permitted.

Wherever possible, the most productive sheep should be retained – that is, those that are likely to contribute to the longer term survival of the business. The priority order for disposal of sheep should be:

1. any unthrifty sheep that are in poor condition;
2. wethers and aged ewes;
3. dry ewes; and
4. quality breeding stock.

Good quality breeding ewes and rams will be the most valuable after the emergency, and should be retained if possible. Making correct decisions about low-value stock may reduce the future level of financial and welfare risk.

⁸ <http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

Shearing

During an animal disease emergency, it might be necessary to postpone shearing to avoid movements of people and stock and additional stress on the animals. If managers decide to shear, careful consideration should be given to seasonal conditions, and the need for adequate shelter and additional feed after shearing.

Table 5 Animal welfare alert: sheep

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 48 hrs off feed	Conserve available pasture
	Pregnant and lambing ewes: 1 kg good hay/head/day Weaners: 0.5 kg hay/head/day (3% liveweight); adjust, if supplemented (Refer to department of agriculture recommendations for sheep nutrition)	Closely assess animals of BCS 1–2. Euthanase any weak, recumbent animals. Remove any 'shy feeders' and feed separately
Water shortage	Weaners: 2–4 L/day	Watch carefully for signs of dehydration and weakness, especially young or lactating stock After period of deprivation, reintroduce water gradually
	Adult dry sheep (pasture): 2–6 L/day Adult dry sheep (saltbush): 4–12 L/day Ewes with lambs: 4–10 L/day	
	Ambient temperature and lactation status greatly affect demand Maximum 36 hrs off water (where no other option is available)	British breeds need 20% more than merinos in hot weather
	Salt content: maximum 4000 mg/L	May increase up to 10 000 mg/L gradually, for short periods
Limited space	Lambing paddocks: maximum 18 ewes/hectare	Only give supplementary feed if necessary — avoid disturbance
	Feedlot: 1 m ² /head (lambs) 1.8 m ² /head (adults)	

4.3 Goats

Background

The Australian goat industry comprises three sectors (meat, dairy and fibre), although there is some overlap in crossbreeding programs. Goats are kept in a wide range of situations, from extensive grazing to closely confined housing. Although overall herd numbers are relatively small, there have been significant advances in breeding and husbandry practices in recent years.

The most significant exotic diseases for the goat industry would be sheep and goat pox, foot-and-mouth disease, screw-worm fly and bluetongue. Response plans for each of these diseases are set out in the relevant **Disease Strategies**.

Table 6 shows the minimum requirements and suggested actions for animal welfare alerts in goat enterprises.

Meat

Australia is the world's biggest exporter of goat meat (as frozen carcasses and live animals) produced mainly from the opportunistic harvesting of feral animals. This trade has provided significant income for sheep and beef producers in pastoral

areas. During the past 10 years, there has been increased crossbreeding of the commonly farmed and feral goat species with the Boer goat, which was imported to improve carcase quality.

Approximately 90% of meat goats are slaughtered for export, with only 5–10% destined for the domestic market. In the event of an exotic disease outbreak, this trade would be suspended.

Dairy

There are five breeds of dairy goat in Australia – Saanen, Toggenburg, British Alpine, Anglo-Nubian and the Australian Melaan. Most dairy enterprises run up to 50 animals, while larger commercial operations can have up to 500 does. Most dairy goats are mated in autumn, when fertility is highest, although the joining period is extended to provide a more continuous milk supply. Dairy goat kids are usually hand reared in sheds.

On larger dairy enterprises, shed layouts and milking machines are similar to those in cattle dairies but with specialised machinery designed for goats. Lactations typically last for about 300 days. Young dairy goats, particularly culled male kids, are commonly sold for meat.

Fibre

Goat fibre is classed as either cashmere (fine) or mohair (coarser). Cashmere fibre is the soft nonmedullated undercoat that grows during winter and is shed in spring; goats are shorn in June–July, before the coat is shed, and before kidding in August–September. Feral goats have been used to upgrade domestic cashmere production, with some Boers also used for this purpose. Angora goats are used to produce mohair, and are usually shorn twice a year. Dry animals generally do not shed their fleece, unlike other fibre breeds.

General management

During an animal disease emergency, it might be preferable to keep goats confined in smaller paddocks to allow closer monitoring, more efficient feeding, reduced energy expended on grazing, and pasture regeneration. There should be sufficient space to allow each goat to move freely to feed and water, and to lie down. Tethering should only be used as a temporary measure.

Goats are more susceptible to cold stress than sheep, especially goats in poor ('backward') body condition. During cold, wet weather, adequate shelter should be provided and, if possible, the ration increased. In extreme cold, goats cannot maintain normal body temperature for more than 4–6 hours. In an emergency, the timing of shearing should therefore be carefully considered.

As far as practicable, routine health and husbandry programs should be followed during an EAD response. Pregnant does are susceptible to stress-induced abortion, and should be subjected to minimal disturbance or movement. On dairies, does in full lactation should be milked at least once daily.

Feed

For body condition scoring of goats, see Appendix 1.1 of the *Australian Standards for the Export of Livestock* (DAFF 2005) and *Body Condition Scoring of Sheep and Goats* (Suiter 1994).

Goats are very adaptable and flexible feeders compared with sheep or cattle. On some grazing enterprises, goats have been run alongside sheep or cattle to take advantage of their different foraging preferences. However, although goats will initially browse the more fibrous of the available plant material, they have very selective feeding habits and will compete for the preferred pasture species if those species are available.

Goats have distributions of body fat different from those of sheep. A smaller proportion of total fat is laid down subcutaneously and a larger proportion is stored within the body as omental, perirenal and visceral fat.

The welfare of goats can be compromised when available green feed is less than 3 cm high, in cold, wet conditions. If goats are overstocked and/or poorly fed, parasitism can be an additional problem.

If it is necessary to hold goats for an extended period during an EAD outbreak, the available feed should be conserved and used strategically to maintain animals above a body condition score of low 2 (lean or backward store). For grazing goats, the level of supplementary feeding should be increased until one-third of a maintenance ration is provided by supplementary feed. If body condition continues to fall, the feeding rate should be increased until condition is maintained.

In some emergency grazing situations, there may be more herbage available in goat-grazed pastures than in sheep-grazed pastures. This will allow goats to graze for a longer period before they fall to a critical condition score. Goats can be out-competed when grazed with sheep on pastures at high stocking rates, and in these circumstances may need more supplementary feeding.

When commencing supplementary feeding, good-quality hay should be used, with a gradual introduction of grain or commercial pellets to avoid grain poisoning. Oats and lupins have higher fibre content than wheat or corn and can be introduced more quickly. If limited hay is available, wheat can be fed alone, but the animals should be closely observed. Treating wheat or any high-energy grain with 2% slaked lime is a useful prophylactic measure against grain poisoning. Shy feeders should be drafted off and fed a ration with 30% roughage.

If goats are fed a full supplementary ration of cereal grains, daily feeding is preferable. However, if there is some available dry pasture (roughage), feeding three or four times a week is possible.

It is illegal to feed goats any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds)

under any circumstances. Further information on this feed ban is available from Animal Health Australia.⁹

Water

Adequate shade and water should be provided to goats grazing dry summer pastures or receiving supplementary feeding. The water intake of angora goats grazing summer pasture is 50% greater than that of merino sheep. Goats' tolerance to salt content in water appears to be similar to or greater than that of sheep.

As a rough guide, average daily water consumption will be 4 L/head; this will vary significantly depending on the bodyweight of the animals and the ambient temperature. During hot weather, water intake can increase to up to 10 L/day.

Table 6 Animal welfare alert: goats

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 24 hrs off feed 3% liveweight/day Supplementation — gradual introduction of grain	Observe closely for grain poisoning Euthanase any weak or recumbent animals Identify and separate shy feeders
Water shortage	Maximum 12 hrs off water, but preferably continuous supply Average: 4 L/day Lactating does: 10 L/day Ambient temperature and lactation status greatly affect demand Salt content: <5000 mg/L maximum	Maintain continuous supply, adequate to meet requirements (proportional to bodyweight, fleece length or lactation status)
Limited space	In feedlots: 0.5 m ² /head	Use smaller paddocks for emergency feeding
Temperature extremes	Protection against cold and heat stress	In extreme cold, wet weather, immediately feed high-energy ration Provide adequate shelter and shade

4.4 Pigs

Background

Most piggeries operate as family farms with up to 200 sows, while a smaller number of large properties run more than 500 sows. These bigger, company-owned enterprises account for about 60% of total production. Large-scale enterprises operating piggeries at multiple sites and independent contract growers are supplying an increasing proportion of production. While domestic consumption in Australia has remained relatively stable in recent years, exports have risen significantly.

⁹ <http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

Most pigs are reared in modern intensive piggeries with controlled environments and carefully formulated feeding regimens. A few extensive free-range enterprises, usually with portable housing structures, supply niche markets. Outdoor piggeries can pose potential health and welfare problems because of climatic conditions and the animals' susceptibility to disease; therefore, good husbandry is essential.

Different classes of pigs are housed separately to provide for their specific requirements. Breeding animals are kept in one facility and, just before parturition, sows are moved to farrowing accommodation. When the piglets are weaned, they are moved to grower sheds, usually into slatted pens or larger grower groups in litter-based systems. As the weaners grow, they are progressively moved into larger pens and/or other sheds. The amount of floor area per pig is critical to their welfare, and this will be an important factor if animals have to be retained for extended periods during an EAD response.

Many units operate a continuous farrowing system in which batches of sows are mated and farrow together, with a batch farrowing each week. In intensive units, various types of farrowing arrangements are used, with the aim of protecting the piglets and providing an acceptable level of welfare for the sow. Whichever system is used, a high standard of husbandry is essential, and should be maintained during an EAD response.

Where pigs are housed indoors, pens should be cleaned regularly to ensure that soiled bedding, faeces and urine do not accumulate to the extent that they pose a threat to the health and welfare of the animals. As far as practicable, pen densities should be managed to maintain separate dunging and sleeping areas in pens.

Whether housed indoors or outdoors, all pigs should be inspected daily. Health and welfare checks by experienced personnel are especially important during an EAD response.

In an EAD emergency, the key welfare issues are likely to be a lack of feed, overcrowding (due to lack of markets) and a shortage of competent labour.

The exotic diseases that present the biggest threat to the pig industry are foot-and-mouth disease, swine vesicular disease, Aujeszky's disease, porcine respiratory and reproductive syndrome (PRRS), African swine fever and classical swine fever. Response plans for each of these diseases are set out in the relevant **Disease Strategies**.

Feed

For body condition scoring of pigs, refer to *Model Code of Practice for the Welfare of Animals – Pigs* (1998).

All classes of pigs should receive a daily diet in adequate quantities and containing appropriate nutrients to maintain good health and welfare. Nutritional requirements will vary considerably with the type of animal, its physiological state and the management system. The appropriate level of feeding is best determined by monitoring body condition (by manual palpation or using ultrasound) and feeding accordingly. If the condition score of grower or finisher pigs, gilts, sows or boars falls below 2 during an EAD response, immediate remedial action is required.

The salt content of the diet is important because of its effect on water intake. Excessive salt without adequate available water can cause convulsions, tremors and sudden death; similar symptoms may also occur on a normal diet if water intake is reduced. Salt levels should not exceed 10 kg per tonne of feed.

A minimum of about 4.5% crude fibre in grain-based diets is required for sows, gilts or boars that are not fed *ad libitum*. Fibre content, which increases the bulk of diets, is important in maintaining healthy gut function, satisfying appetite and managing energy intake. A bulky diet will also help reduce stereotypical behaviours and aggressiveness.

Because of wastage, loss of feed to birds and higher metabolic requirements (especially during cold, windy, wet weather), pigs kept outdoors may require up to 25% more feed than those housed in sheds.

Automatic feeding systems should be checked at least once every 24 hours to ensure that they are in working order and that each pig is receiving its daily feed allowance. With such systems, it is important that the health and condition of all animals is closely monitored by an experienced worker.

It is essential that all newborn piglets receive colostrum or an appropriate substitute within 24 hours of birth. Any piglets receiving inadequate nutrition should, if possible, be fostered onto another lactating sow. This needs to be carefully managed, and, if it is unsuccessful, the piglet should be humanely destroyed. In an emergency, hand-rearing of piglets is unlikely to be a practical alternative.

Water

An adequate water supply is essential to maintain health and welfare, especially in hot weather. While most systems provide continuous access to water, others use wet feeding systems that deliver water requirements in the feed.

Automatic watering systems should be checked at least daily, and twice daily in hot weather.

Daily water consumption will vary according to the ambient temperature and the weight of each animal. While young pigs up to 10 kg liveweight will drink about 2 L/day, a lactating sow can require 15–40 L.

Space

The space requirements for particular types of pigs depend on the management system, feeding strategy, group size, age of animals, ventilation and other husbandry factors. Recommended minimum space requirements for breeding stock and growers held in pens are listed in the *Model Code of Practice for the Welfare of Animals – Pigs*.¹⁰

¹⁰ <http://www.publish.csiro.au/nid/22/pid/1546.htm> (Accessed 12 March 2007)

If finishing pigs have to be held for an extended period during a disease emergency, management of the available space is likely to be critical. Increased aggression (tail biting, etc) and soiling of rest areas are signs that stocking densities may be too high, and the densities should be reduced until such behaviours cease. For boars, sows and gilts not kept in stalls, and for all growing and finishing pigs, sleeping areas (ie not including dunging areas) should be large enough to accommodate all the pigs lying on their sides.

For pigs kept outdoors, the average stocking density for the entire herd should not exceed 25 pigs per hectare. Optimal stocking density will depend on soil type and rainfall; as a general guideline during an emergency, lactating sows and litters should be stocked at a maximum of 15 sows per hectare and pregnant animals at 25 sows per hectare. The accumulation of faeces should be monitored.

Ventilation and temperature

In enclosed sheds, a ventilation system is required to provide fresh air, remove excess heat and moisture, remove waste gases and reduce dust levels. Control of ammonia levels is particularly important because high ammonia levels can cause eye and respiratory irritation in pigs, resulting in discomfort and respiratory disease. Personnel should check for the presence of noxious gases at pig height; any eye or nasal irritation to humans will also be harmful to the pigs.

Pigs older than 10 weeks can tolerate a wide range of temperatures, provided that changes occur gradually. However, newborn piglets have difficulty maintaining their body temperature independently of their surroundings; it is therefore important to provide a suitable ambient temperature, usually by using infrared heat lamps or heat pads.

For pigs of any age, if the internal shed temperature and humidity are high, there is a risk of heat stress, especially if the stocking density is high. If stock numbers cannot be reduced, it might be necessary to install additional ventilation equipment.

Mixing of pigs

Pigs are hierarchical by nature, and mixing unfamiliar pigs can result in fighting and injury, especially if it is also necessary to increase stocking densities during an emergency. This situation will be difficult to manage if space is restricted and it is not possible to cull aggressive animals. If mixing of unfamiliar pigs is essential and the facilities allow, use a pen that is 'new' for all animals, provide some feed on the floor, use group sizes of 50 animals or more, and select animals of similar bodyweight.

Table 7 Animal welfare alert: pigs

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 24 hrs off feed Sows, gilts and boars: minimum 4.5% crude fibre in grain-based ration	All pigs fed daily BCS at least 2
Water shortage	Maximum 12 hrs off water, but preferably continuous supply Lactating sows: 15–40 L/day Dry sows: 11 L/day Growers: 3–6 L/day Ambient temperature and lactation status greatly affect demand Salt content: maximum 4000 mg/L	Maintain continuous supply, adequate to meet requirements (proportional to bodyweight or lactation status) May increase gradually up to 6000 mg/L
Limited space	Indoors: adequate floor area critical to minimise fighting, heat stress, etc (refer to recommended formula) Outdoors: maximum 25 pigs/hectare; sows + litters: 15/hectare	Adhere to minimum standards, according to bodyweight Thin out pens using temporary accommodation, slaughter or emergency euthanasia

4.5 Poultry

Background

The Australian poultry industry is based on two main products: meat and eggs. Although commercial production and processing of eggs and chicken meat are separate and distinct industries, the farms (production units) are often geographically close and share a number of infrastructure elements. However, there are significant differences between the egg and meat sectors from a welfare perspective. During an EAD response, the welfare of small backyard poultry flocks must also be considered.

In normal circumstances, there is widespread movement of live poultry, eggs and poultry products throughout the country and across state borders. The imposition of movement restrictions in an EAD outbreak will severely disrupt commercial activity, with potential adverse consequences for animal welfare.

The EAD posing the highest risk for the poultry industry is likely to be either Newcastle disease or avian influenza; outbreaks of both diseases have occurred in Australia.

Table 10 shows the minimum requirements and suggested actions for animal welfare alerts in poultry enterprises.

Chicken meat industry

Most chicken meat is produced by individual farmers who are contracted to a limited number of large processing companies. The processing companies often also have their own growing facilities. The producer owns the land, shed and equipment and is paid a rearing fee by the processor, who owns the birds and the feed. The processors are usually large, vertically integrated companies owning breeding and hatching operations, feed mills, processing plants and wholesale marketing operations.

On most meat-chicken rearing properties, sheds are thinned out in three stages, based on sample weighings. At about 28 days, when birds have reached about 1.7 kg, 20% might be removed for processing. When the birds reach approximately 2 kg, a further 20% will be harvested. The remaining birds are then grown to about 3 kg.

Egg industry

Approximately 90% of commercial egg production comes from caged layer farms, with the remainder produced on either deep litter, free-range or 'barn-laid' farms.

Layer hens are reared to about 16 weeks in a rearing shed or farm. When reared on a separate farm and sold to the egg producer at point of lay, the birds are called 'started pullets'. Traditionally, adult hens are kept in production for about 12 months. However, a significant number of producers now moult hens at the end of the initial 12 months to get a second cycle of production.

The commercial egg industry is less vertically integrated than the meat industry. Egg production properties and processing plants may be owned by individual companies, some of which may own a number of separate farms.

Types of enterprise

From an animal welfare perspective, there are four significant types of enterprise in the poultry industry:

- fertile egg (breeder) farm;
- hatchery;
- meat chicken (broiler) farm; and
- layer (egg) farm.

Each of these enterprises poses different potential welfare risks, as discussed below under 'Movement restrictions and welfare during EAD responses'.

Fertile egg (breeder) farm

The production of fertile eggs occurs at two levels. The first (nucleus) breeder level comprises the grandparent and great-grandparent breeders. The second (multiplication) level comprises the parents of the commercial birds. The nucleus birds are much more valuable than the parent breeders, as reflected in the stringent quarantine procedures and high welfare standards on nucleus breeder properties. In an EAD response, every effort will be made to preserve such breeding stock.

Hatchery

Fertile eggs from breeder farms are usually transported to a separate hatchery property in an insulated truck. After fumigation, the eggs are incubated in a setter machine for 18 days, before being transferred to the hatcher for the final three days. Some chicks may start pipping through the shell at 19 days. The hatcher trays are taken to a chick handling room where the hatched chicks are sorted, culled, sexed, vaccinated and placed in plastic crates. The selected chicks are held for the shortest possible time before delivery to the farm where they will be reared.

Just a few hatcheries supply most of the Australian industry, and many day-old chicks are trucked great distances, including across state borders. The chicks can be held without food or water for up to 60 hours if maintained at the correct temperature.

Day-old male layer-strain chicks and other cull chicks are killed at hatching by gassing with carbon dioxide. In an EAD response, the welfare risks for chicks are relatively low.

Meat chicken farm

Meat chickens (broilers) are usually reared in sheds that may contain between 20 000 and 40 000 birds, with up to 12 sheds per farm.

Chicks are provided with a supplementary source of heat for the first 3–4 weeks. The bird pick-up for processing may begin at about 28 days. If birds are not able to be removed according to the processing schedule, due to their rapid growth rate, overcrowding occurs quickly. Therefore, it is imperative that arrangements are in place to avoid this.

Layer (egg) farm

The Australian commercial layer hen population is about 10 million birds, with perhaps another 3–4 million in backyards. Sixty per cent of commercial production is in New South Wales and Victoria.

Movement restrictions and welfare during EAD responses

Diagnosis of an EAD will result in imposition of movement controls and immediate application of quarantine on all suspect premises. For commercial and animal welfare reasons, it is important that restrictions on declared premises are eased as soon as circumstances allow.

On a chicken broiler property with rapidly growing birds approaching slaughter weight, movement restrictions could create significant welfare problems. As birds continue to grow, space limitations will cause overcrowding and consequent trauma, health problems, collapses and deaths. The possible option of moving them to a processing plant will need early assessment, and procedures developed to allow this to occur while preventing disease spread.

In the egg industry, movement restrictions will generally have a delayed, less dramatic effect on animal welfare. Laying hens will continue to produce, provided that the normal management regimen can be maintained. However, the disposal of spent hens at the end of the production cycle might create difficulties.

At hatchery properties, hatchery debris (unhatched eggs, eggshells and culled chicks) could create a disposal problem during an EAD response.

Feed

All poultry other than newly hatched birds should be provided with normal dietary rations at least once a day. Newly hatched chicks must be provided with food and water within 60 hours of hatching.

The weekly feed requirement for all birds on the premises and the quantity of feed on hand should be carefully monitored. Any difficulties encountered in sourcing adequate feed supplies should be reported to the site supervisor or AWO.

Water

Poultry must have access to sufficient water to meet their physiological requirements. No birds other than newly hatched chicks should be deprived of water for more than 24 hours. In hot weather, water should be provided continuously, with any deprivation not exceeding 12 hours.

Any limitation of water supply or problem in providing an adequate supply to all birds must be reported to the LDCC immediately.

Space

Three main housing systems are used in egg production:

- cages in sheds;
- barns, where birds are free to roam within the shed, either on litter or on flooring constructed of slats or wire mesh, and with nest boxes for laying; and
- free-range, where birds are housed in sheds similar to barn sheds, but with access to an outdoor range.

In an EAD response, there should be no immediate welfare problem relating to space, and normal husbandry should be maintained. However, the prompt and effective disposal of material that cannot be effectively treated, such as dead birds, eggs, litter and manure, will be a high priority (see the **Disposal Manual**).

For chicken meat production, two main housing systems are used:

- sheds, where birds are able to move around on deep litter, and temperature and ventilation are controlled; and
- free-range, where birds have access both to an outdoor range and to indoor shelter.

In deep litter systems, the management of the litter is critical for the welfare of the birds. The depth of litter should be related to the stocking density and length of time birds are expected to be in the shed. Litter should be managed to avoid caking, excessive dampness or dustiness. Nest litter for laying hens should be kept dry, friable and capable of absorbing moisture (excreta). Nest liners should be kept clean and dry.

In all housing systems, the space allowed for each bird will vary with the weight, species, breed, strain and type of bird. The stocking density will also depend on the type and quality of housing and the ability to maintain acceptable levels of temperature, humidity, ventilation and lighting. If there is any evidence of poor health or behavioural changes, such as cannibalism, the stocking density should be reduced immediately.

Cage systems

The allowable stocking densities for various types of birds are shown in Table 8.

Table 8 Minimum space requirements for poultry

Type of bird	Number of birds per cage	Minimum area per bird (cm ²)	Maximum live weight per unit floor area (kg/m ²)
Layer hen (< 2.4 kg)	3 or more	450	–
Layer hen (2.4–4.5 kg)	3 or more	600	–
Layer hen (< 4.5 kg)	2	675	–
Layer hen (< 4.5 kg)	1	1000	–
Laying or breeding hen (> 4.5 kg)	3 or more	–	46
Laying or breeding hen (> 4.5 kg)	2	–	40
Laying or breeding hen (> 4.5 kg)	1	–	26

These minimum space allowances apply to birds that are housed under good management with optimal temperature and ventilation. Even in an emergency, these maximum stocking densities should not be exceeded for more than 24 hours.

Non-cage systems – indoor

The maximum allowable liveweight density for all types of growing and adult layer breeders and meat chicken breeders is 40 kg/m² of floor area, assuming that the cooling systems and ventilation fans are operating to ensure effective temperature control at all times. The maximum stocking densities for different types of ventilation are shown in Table 9.

For rapidly growing meat birds housed indoors, heat stress is a critical threat to welfare. The combination of predicted weather patterns, shed design, temperature and humidity control, and the grower's management record should be considered in assessing the welfare of the birds. Also, higher stocking densities during an EAD outbreak will restrict the birds' ability to move, and may result in increased leg weakness. This should be monitored and any adverse findings reported to the LDCC.

Table 9 Maximum allowable stocking densities for various types of sheds

Type of housing	Minimum requirements	Maximum density
Tunnel ventilated or other extractive systems	Evaporative cooling system One air exchange/minute	40 kg/m ²
Other mechanical ventilation	Stirring fans	40 kg/m ² (winter)
	Water-based cooling system	36 kg/m ² (summer)
Non-mechanically ventilated		28 kg/m ²

Non-cage systems – free range

For free-range layer hens, the maximum allowable density is 1500 birds/hectare. When meat chickens are run outdoors, a proportionately higher stocking density is acceptable, but the pens should be managed to maintain some fodder cover.

Ventilation – temperature and humidity

Adequate ventilation should be maintained for all birds housed in sheds, to ensure acceptable temperature, humidity and air quality.

In normal circumstances, the relative humidity should be kept below 80%, especially at temperatures above 30°C. Accumulation of ammonia or hydrogen sulphide should be avoided; if either gas can be detected by smell, remedial action should be taken immediately.

Normally, birds can adapt to a wide temperature range (10–33°C). However, certain classes of birds, such as heavy meat chickens and breeder birds, are susceptible to sudden increases in temperature, especially if the humidity is also high.

Standards applicable to turkeys, ducks, geese, pheasants, guinea fowl, partridge, quail and pigeons are contained in *Model Code of Practice for the Welfare of Animals – Domestic Poultry* (2002).¹¹

Table 10 Animal welfare alert: poultry

Problem	Minimum requirements	Suggested action
Feed shortage	Newly hatched chicks: feed within 60 hours Other birds: feed at least every 24 hours Refer to <i>Model Code of Practice for the Welfare of Animals – Domestic Poultry</i> for minimum feed and water requirements	Ensure that adequate reserve feed is available
Water shortage	Maximum time off water 24 hours (except newly hatched chicks — 60 hours) Salt content: maximum 2000 mg/L	May increase gradually up to 3000 mg/L
Limited space	Laying and breeding hens: refer to above recommendations Barn systems (7–18 weeks): 18 kg/m ² Barn systems (>19 weeks): 30 kg/m ² Free-range (7–18 weeks): 18 kg/m ² Free-range (>19 weeks): 30 kg/m ²	Thin out birds by culling or moving to temporary accommodation
Inadequate ventilation	Ambient temperature below 33°C Shed humidity below 80%, especially if temperature is >30°C Ammonia: less than 20 ppm Hydrogen sulphide: less than 5 ppm Carbon dioxide: less than 3000 ppm	Immediately act to fix ventilation system; otherwise remove birds

¹¹ <http://downloads.publish.csiro.au/books/download.cfm?ID=3451> (Accessed 12 March 2007)

4.6 Ratites (emus and ostriches)

Table 11 shows the minimum requirements and suggested actions for animal welfare alerts in ratite enterprises.

4.6.1 Emus

Background

Commercial emu farming to produce meat, leather and oil began in 1987. All states now permit emu farming (based exclusively on captive-bred stock); however, production was drastically reduced in 1996 because of significant overproduction and lack of marketing expertise. More recently, there have been positive developments with the introduction of a quality assurance program for emu products and prospects of expanding markets.

Emu farming is a semi-intensive enterprise, requiring suitable land, fencing and water supply for adult and growing stock; shedding for young birds; feed-mixing facilities; and ready access to a wide range of feed ingredients or prepared feed. Chickens can be sold at hatch or at 6–10 weeks of age, or retained until they reach slaughter weight at 12–15 months of age.

The lifespan of emus is 30–40 years, and birds mature at 2–3 years. In lay, females produce an egg about every three days, and will lay about 25 eggs each year. Incubation is approximately 50 days.

Emu production requires husbandry skills in breeder flock management, hatchery management, chick rearing, and growing birds through to market weight. The birds are difficult to handle, transport and move between pens. If normal management programs are disrupted during an EAD outbreak, the expertise and experience of the owner will be very important.

General management

A successful emu-farming venture will hatch 75–80% of all eggs, and rear chicks with a total mortality of less than 10%. Artificial incubation is commonly used, with separate setting and hatching machines. Eggs can be stored before incubation to regulate the number of hatches each season, thus achieving reduced rearing mortalities.

Emus show a high level of resistance to most diseases, and most mortality is caused by poor hatchery and rearing hygiene. They are, however, susceptible to erysipelas caused by the bacterium *Erysipelothrix rhusiopathiae*. This organism thrives in wet, dirty conditions and causes a generalised septicaemia in young growing birds 7–12 months of age. A commercial vaccine is available.

Feed

Limited information is available about the nutritional requirements of emus. For free-range stock, careful management is necessary because overstocking can denude the plant cover.

At the stocking densities used on most properties, emus will be able to obtain only a small proportion of their nutritional needs from pasture and natural browse. Birds can be fed a farm-mixed ration or commercial product that is similar to the formulation for poultry laying stock. Birds are often fed a low-protein, high-energy finishing ration for the 8–10 weeks before they are turned off.

Breeding birds are also fed a poultry layer ration, fortified with additional vitamins and minerals.

Space

Breeding birds can be housed as individual pairs in pens (minimum 25 m square) or run as a free-range flock, preferably with a maximum of 32 breeders in 2-hectare paddocks. Most properties operate a combination of free-range paddocks and pens for breeding pairs. Breeding birds usually remain productive for at least 10 years, and the availability of pens allows the reproductive performance of new stock to be assessed before they are moved to the bigger paddocks.

4.6.2 Ostriches

Background

During the past 20 years, the ostrich industry has grown steadily in several countries outside Africa, including Australia, New Zealand, the United States, Canada and China, although the local industry has suffered some recent decline. The main products are meat and leather. Other commercial products are oil, feathers and eggs. The biggest concentration of the ostrich industry is in central Victoria and southern New South Wales.

Ostriches can live up to 70 years, with 50 years being the average. Birds will start breeding at 2–3 years, and may continue for up to 20 years. Ostriches will establish 'breeding attachments', usually a pair or one male and two females. Eggs are laid about every second day, with total annual lay of approximately 40 eggs. Average incubation period is 42 days.

General management

Ostriches should only be handled by experienced personnel. They have a powerful kick in a forward and downward stroke and can cause serious injury to a handler because of their strength, speed and sharp talons. Adult male ostriches that have established themselves in a paddock become territorial and may attack intruders, including their regular handlers. They are more aggressive during the breeding season, from spring to autumn. Temperament can vary between breeds and individuals; because placid birds can become aggressive without warning, all ostriches should be treated with caution at all times.

After becoming familiar with yards and handling facilities, birds become easier to handle. Ostriches should not be rushed, as they are easily startled and will quickly disperse.

Hoods are commonly used to calm ostriches once they have been captured, and to facilitate handling of aggressive birds.

Regardless of whether an EAD response is under way, ostrich flocks should be inspected at least once each day, preferably at feeding times. More frequent inspections may be necessary when groups have been mixed, during the breeding season or in hot weather. Any sick, dead or injured birds should be removed without delay and the cause of death should be ascertained; this is critically important during an EAD outbreak, especially if the ostriches may have had contact with wild birds.

Some lines of ostriches are susceptible to leg rotation. An affected bird must be treated immediately. If the bird has difficulty in rising and there is significant heat, pain and swelling, it should be euthanased immediately.

Ostriches of all ages are vulnerable to impaction of the proventriculus. This most commonly occurs in chicks under 4 months old that have been exposed to stress, injury, infectious disease or inappropriate materials (such as sticks or foreign objects), particularly under high stocking densities. Chicks should have access to pebbles or stones up to 20 mm diameter, to aid grinding of feed in the proventriculus.

Feed

Ostrich management systems have typically relied on significant inputs of commercially formulated pellets, although some producers have used pasture as a feed source. The use of this low-cost feed has significant potential in the Australian industry. The ostrich is well adapted to digest fibre because of its sacculated caecum, which provides a suitable environment for fermentative microflora, similar to the rumen in cattle. Adult ostriches digest starch as effectively as do poultry, but digest fibre much more efficiently.

In their natural habitat (dry semi-arid country), ostriches favour open plains offering short herbage and pasture species for foraging. This environment provides the ideal omnivorous diet, with the birds selecting high-quality pasture species that may be supplemented by insects, etc. Ostriches are well adapted to poor grazing conditions and, in a disease emergency, should be able to find enough sustenance where sheep or cattle would perish.

Ostrich chicks begin feeding about 5 days after hatching. In an artificial incubation system, most chicks will need to be taught how to peck at food by an experienced older chick.

Water

Water is the most important component of the ostrich diet, and should be available continuously. Daily consumption is extremely variable, depending on ambient temperature, type of feed, stage of production, growth rate and water quality. The amount of water available should be at least twice the weight of dry feed consumed.

Space

Minimum space requirements for different classes of stock are listed in Table 11. If it is necessary to hold animals and move them between paddocks in an emergency, any overcrowding is likely to cause stress, fighting and injury, and also significant pasture degradation.

Table 11 Animal welfare alert: ratites

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 24 hrs off feed Chicks to 8 wks: feed available at least 10 hrs/day	Supplement with commercial pellets (poultry or pig) if pasture inadequate
Water shortage	Maximum 12 hrs off water, but preferably continuous supply Emus (adult): 4–6 L/day Ostriches (adult): 9–14 L/day	Maintain continuous supply of good quality water
Limited space	Emus (breeder pens): minimum 25 × 25 m Ostriches: <ul style="list-style-type: none"> • chicks to 6 weeks: 3 chicks/m² • 6 wks – 6 mths dry country: max 85 birds/ha irrigated: max 125 birds/ha • 6–18 mths dry country: max 50 birds/ha irrigated: max 100 birds/ha • mature dry country: max 12 birds/ha irrigated country: max 24 birds/ha 	Reduce stocking density by moving some birds to temporary yards

4.7 Horses

Background

The equine industry is arguably the most diverse of the livestock industries. Horses are used for a range of sporting and recreational purposes, and feral brumbies and donkeys roam across extensive areas of pastoral and semi-desert country. The industry comprises a number of distinct sectors – racing, breeding, equestrian organisations, events and businesses – that together contribute more than \$6 billion annually to the Australian economy. The significant international movement and trade of horses and semen pose an EAD risk that requires careful management.

The outbreak of an exotic equine disease would significantly disrupt the industry; there could be a ban on all movement of horses, suspension of all equestrian events, quarantine of premises and mass vaccinations. Although some 30 exotic diseases could affect the horse industry, the most significant are equine influenza, African horse sickness, contagious equine metritis, surra and Japanese encephalitis. Response plans for each of these diseases are set out in the relevant **Disease Strategies**.

The declaration of a general horse movement standstill would necessitate special arrangements for horses in transit, and also for the transportation of acutely injured or sick animals.

Although the health and welfare of most horses are maintained at a high standard, some horses may be neglected during a disease emergency. The AWO and field personnel should be alert to this possibility, especially where horses are checked only sporadically.

Table 12 shows the minimum requirements and suggested actions for animal welfare alerts in horse enterprises.

General management

During a disease emergency, the frequency and level of supervision of horses should be consistent with the maintenance of good health and welfare. Horses kept under close confinement in stables and yards should be inspected, fed and watered at least twice each day. The level of supervision required for horses grazing under more extensive conditions will depend on stocking density, pasture availability, nature and disposition, age and pregnancy status, the state of the fencing and the reliability of water supply. Mares in late pregnancy should be observed at least daily for signs of impending foaling.

Routine husbandry procedures and veterinary treatments may be continued, providing they do not compromise the disease control program. The risks associated with the movement of service providers such as farriers must be carefully assessed. Wherever possible, hooves should be trimmed as required to allow normal mobility, and shoes should be either inspected daily or removed when horses are not being worked.

Feed

For body scoring of horses, see *Body condition scoring and weight estimation of horses* (Carroll and Huntington 1988).

The nutritional needs of horses vary according to the age, growth, activity, physiological status and environment of individual animals. Horses are usually able to consume up to 3% of their bodyweight per day. Correct nutrition of pregnant mares, foals, weanlings and yearlings is very important for their health and welfare, and should not be neglected during an emergency. When assessing whether pasture can meet the needs of a horse, the state of the pasture, energy demands of the horse, growth rate and digestibility of the pasture, daily intake and stocking density should all be considered. Detailed information about the nutritional requirements of different weights and classes of horses is available from departments of agriculture.

Horses are natural browsers and tend to select grasses, clovers and herbs, after which they move to a new area, avoiding areas soiled by manure. Horses normally spend about 16 hours a day grazing, during which time they may travel over 5 km.

Well-managed, productive pastures can supply all a horse's nutritional requirements, with supplementation only required when horses are in heavy work or where soil mineral deficiencies are present. The key to healthy, productive pastures is effective management techniques, especially grazing control, manure management and weed management. Effective grazing management can prevent pastures becoming 'horse sick', with extremes of closely cropped lawns and rough areas of tall rank growth. Manure management is important in preventing 'horse sick' pastures. Daily manure collection is the best technique.

If it is necessary to retain horses on a property for an unexpected extended period and the pastures are mostly annual species, or the soil type is unstable, it might be advisable to reduce the stocking density. At least some of the horses could be confined to a smaller 'feedlot' area, in yards or stables.

Depending on the particular disease involved, there is a possibility that all racing and equestrian events will be suspended in an EAD response. In such circumstances, many horses could be taken out of work or breeding could be deferred, thus reducing the need for energy supplementation. The estimated cost of feeding a lactating mare for 6 months is about 70% more than for a dry mare. If feasible, delaying the time of breeding for a late spring birth could greatly reduce the amount of supplementary feeding, as more pasture is normally available in spring. A more drastic measure is not to breed that year, or to select only the best broodmares to breed.

Early weaning can reduce overall feed consumption and simplify management of both mares and foals. Foals should be weaned no younger than 10 weeks of age and with a bodyweight of at least 140 kg. Young stock should not be allowed to fall below body condition score 2.

Compared with large horses, ponies can usually survive on relatively small amounts of supplementary feed, and grass hay will usually provide adequate nutrition.

Horses require additional energy during cold, windy weather, when the ration should be increased by at least 20%. Hay is the safest feed for a sudden increase in rations, but it can gradually be replaced by grain if the higher ration has to be sustained. If grain alone is to be fed, the frequency of feeding rather than the amount offered should be increased and dry pasture must also be available. Rugging horses or providing shelter will save energy, and less feed will be required to maintain condition.

As a rule, at least 1% of a horse's bodyweight is required as roughage, to aid digestion. Thus, roughage – provided as hay, pasture, crop residue or chaff – should comprise approximately 50% of the diet.

Additional calcium is required for most supplementary feeding with grain, and 2% finely ground agricultural limestone should be added. Most grains are deficient in sodium, and common salt can be added at 0.5% if needed; often, the water will contain sufficient salt. Both calcium and salt can be provided in a commercial lick (block).

Water

The basic maintenance requirement of water for horses is about 52 mL/kg bodyweight per day. Most horses will drink about 25–30 L/day during hot weather, but this can increase to 50 L/day in extreme heat. The salt content of the water should be monitored; young horses will tolerate levels up to 5000 ppm, while adult animals can accept levels to 6500 ppm. Water sources containing salt above these levels should be used with caution. Water containing more than 400 ppm magnesium should not be used.

Daily water requirements are listed in Table 12, and should be increased according to work, growth or lactation. The requirement will increase with ambient temperature – for example, a 15–20% increase for a temperature change from 13°C to 25°C.

Space

Yards, shelter sheds, loose boxes and stalls should not restrict horses' freedom to stand, lie down, stretch or groom themselves. Horses should be accommodated

singly in loose boxes and tied if in stalls. Loose boxes should have a floor area of at least 12 m² for horses and 9 m² for ponies; they should be 2.4 m high. Dirty bedding, manure and stale or dirty feed and water should be removed each day.

Horses should not be tethered unless they are placid and trained to accept it. Horses tethered for grazing should be fitted with a secure collar or halter attached to a light chain that is at least 9 m long, fitted with a swivel at each end. This should be a short-term practice only.

Table 12 Animal welfare alert: horses

Problem	Minimum requirements	Suggested action
Feed shortage	Maximum 24 hrs off feed Feed according to body condition — maintain at BCS 2 or above	If pasture is inadequate, provide supplementation as recommended
Water shortage	Ponies (200–300 kg): 10–15 L/day Horses (300–450 kg): 15–25 L/day Horses (450–500 kg): 25–30 L/day Requirements increase significantly with work, lactation or temperature	Maintain continuous supply, adequate to meet requirements (proportional to bodyweight or lactation status)
Limited space	Housed in groups: minimum 6 m ² resting space per animal Loose boxes (horses): 12m ² floor area Loose boxes (ponies): 9 m ² floor area	Agistment or sale

4.8 Deer

Background

Currently, five species of deer are commercially farmed in Australia: three from temperate climates (red, fallow, wapiti) and two tropical species (rusa, chital). The industry is relatively young, and in recent years has experienced some setbacks caused by a combination of drought and low financial returns. The venison industry is small compared with other red-meat industries, and 90% of total production is sold into international markets. This export trade would be seriously jeopardised in the event of an EAD outbreak involving deer.

From a welfare perspective, deer have a markedly different physiology and temperament from other farmed species. They are highly social and hierarchical animals that seek comfort in the herd. They have a strong natural flight response and other species-specific behaviours, including wallowing, rutting and specific calving behaviour. Newly weaned deer are vulnerable to separation stress. It is especially important that experienced workers are responsible for the management and care of farmed deer, especially during a disease emergency when appropriate management and feeding will aid the animals' survival.

Exotic diseases that could affect deer are foot-and-mouth disease, bluetongue and screw-worm fly. Response plans for each of these diseases are set out in the relevant **Disease Strategies**.

Table 13 shows the minimum requirements and suggested actions for animal welfare alerts in deer enterprises.

General management

The correct management of antlers is an important welfare and safety issue. Around January–February, bucks and ‘spikers’ will become aggressive, and usually remain dangerous until the following September. Regardless of whether an EAD response is occurring, antlers should be managed by castration, polling or harvesting for velvet. Even when bucks are velveted and the regrowth cut, the hard buttons will be hazardous to other stock; therefore, male fawns should be removed from does well before their antlers go hard. In most species, deer in ‘hard antler’ should not be yarded with other deer, and should be penned singly in facilities with limited space that restrict movement.

Because of the late descent of their testicles, some deer cannot be castrated when very young. Castration, if carried out, should be performed before 6 months of age by a competent person.

All yards and boundary fences should be constructed so as to securely and safely contain the deer. During a disease emergency, it is important that all fences, particularly along the property boundary, are checked regularly.

Most deer can adapt to a wide range of temperatures, but the tropical breeds are susceptible to cold stress. The prevention of wind chill is an important welfare factor for deer; good shelter can also reduce maintenance feed demand by 15–20% in cold weather.

If deer must be transported, a period of emptying out is advised 4–6 hours before departure.

Feed

For body condition scoring of deer, see Appendix 1.1 of the *Australian Standards for the Export of Livestock* (DAFF 2005).

Deer have a typical ruminant digestive system and require similar nutrients to other ruminants, such as cattle or sheep. The quality and quantity of the diet required to maintain health and body condition in farmed deer will depend on the species, the environment (including temperature) and lactation status. In winter, the appetite of deer is depressed and weight loss occurs, particularly in mature males (commencing from the autumn rut).

Feeding levels are best determined by monitoring the body condition of the deer, or by regular liveweight monitoring. Body condition scoring is based on palpation of the ribs, spine, pelvis and rump; the scoring system ranges from 1 (emaciated) to 5 (over-fat). Direct palpation is preferred because visual assessment of the body condition of live deer is difficult, especially during winter when coat hair is long.

In southern Australia, the production of deer for the venison market is strongly dependent on the seasonality of pasture supply and quality. On most fallow deer enterprises, fawning occurs in early summer, and lactation continues until weaning in autumn or winter. Poor-quality pasture residues in summer and the reduced availability of pastures (which are of low quality) in autumn limit the growth of young deer, and supplementary feeding is usually necessary.

The aim of venison production systems is to raise weaners to reach target market weights by about 12 months of age. However, in an emergency with prolonged movement restrictions, it might be necessary to carry animals over a second summer. In most areas, post-rut weaning results in stock being put onto winter pastures at a time when pastures are of high quality but have poor growth rates, and supplementation is often required. The best supplements are barley and lupin grain (ideally, a 70:30 mix), but hay, silage or lucerne can suffice, especially just after weaning.

It is illegal to feed deer any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds) under any circumstances. Further information on this feed ban is available from Animal Health Australia.¹²

Changes in diet, especially if feeding grain or other carbohydrates, should be gradually introduced over 4–6 days to minimise digestive problems.

Adult stags dramatically reduce their food intake during the autumn rut, when they naturally lose up to 30% of bodyweight. Additional high-energy feed should be provided immediately after the rut, to bring stags back to condition.

Even if joining is deferred during an emergency, young does should be given preferential treatment to preserve their breeding potential.

Water

Deer require continuous access to an adequate supply of high-quality water. Requirements vary widely according to species, bodyweight, ambient temperature and type of diet. As a guide, lactating animals on dry summer pasture require up to 10 L (fallow deer) or 20 L (red deer) daily.

Space

In an emergency, it may be necessary to hold deer in yards or sheds for an extended period. Sufficient floor space should be provided to allow free movement and rest, and to minimise fighting. As far as possible, groups should be of similar bodyweights, and stocking densities should be calculated based on the heavier animals.

¹² <http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007)

Minimum space allowances, based on bodyweight and size, are:

- 1.2 m² per 50 kg weaner, increasing to 1.8 m² for deer up to 80 kg;
- 2.1 m² per adult female deer up to 120 kg; and
- 2.8 m² per adult male deer up to 200 kg.

Ceiling heights should be no less than 3 m. Larger pens, with a floor area of more than 36 m², are preferable. For deer housed for prolonged periods, the use of 'environmental enrichment' – hanging chains or tyres, plastic balls or a radio playing – may help reduce aggressive behaviour.

Male deer with hard antlers should not be confined indoors.

Table 13 Animal welfare alert: deer

Problem	Minimum requirements	Suggested action
Feed shortage	Supplementary feeding — maximum 3-day intervals	Euthanase any weak or recumbent animal
Water shortage	Maximum 12 hours off water (6 hrs maximum in transport or lairage)	Check water supply daily
	Weaners: 1–2.5 L/day, at 20°C	For every 5°C above 20°C, add 1 L/day per 100 kg liveweight
	Hinds (dry): 2–4 L/day	
	Hinds (lactating): 7–10 L/day	
Stags: 4–7 L/day		
Limited space	If kept in yards or sheds, adhere to maximum stocking densities (see text)	Watch for signs of aggression
Inadequate ventilation	Ammonia levels should not exceed 10–15 ppm. Any discomfort to humans will indicate unacceptable levels	Provide additional ventilation

4.9 Camelids

Background

The family Camelidae includes the dromedary (one-humped, from India, the Middle East and Africa), the Bactrian camel (two-humped, from Asia), and the four South American species – llamas, alpacas, guanacos and vicunas.

The dromedary was first imported into Australia in 1840, and then for the next 60 years for draught purposes in inland areas. With the development of mechanised transport, many animals were slaughtered or escaped, and Australia now has the only population of feral camels in the world.

The import of South American camelids into Australia is a relatively recent development, and these valuable stock are usually well cared for. The major exotic diseases of interest in camelids are bluetongue (subclinical, but of epidemiological significance), Rift Valley fever and screw-worm fly. Response plans for each of these diseases are set out in the respective **Disease Strategies**.

In general, the welfare requirements of camelids are very similar to those of cattle.

4.9.1 Dromedary

Worldwide, the camel is used extensively for its meat, milk and hide as well as for transport. Camels are highly adapted to the Australian pastoral and desert regions, and the feral population continues to increase, although there are widely varying estimates of numbers. In Western Australia, camels have been declared vermin and are periodically culled. However, more recently there has been interest in developing a camel farming industry.

Camels are highly mobile, and even when feed is abundant they may forage over 70 km each day. Cows are usually together in groups of up to 20 that are temporarily herded by a single bull. Camels will graze effectively alongside cattle, generally selecting a different range of fodder shrubs, and they are comfortable in a mixed herd with cattle.

Camels have similar foregut fermentation to that of ruminants, but use water, energy and protein at about one-third the rate of cattle. The hump is composed of fat, blood vessels and fibrous tissue, and can make up more than 25% of an animal's bodyweight. When kept in yards, camels require a high-bulk diet (approximately one-third of a bale of hay per day). They will adapt to the gradual introduction of supplements or pelleted fodder, such as cattle 'shipper' pellets. It is essential to provide coarse salt or soft salt blocks containing only low levels of urea.

Free-ranging camels derive all or most of their water from the plants they eat. However, unless trained to be without water, camels should have daily access to clean water, especially as dietary plants often have a low moisture content. Adult camels require 30–40 L of water per day.

For transport by road, camels should be drafted into groups of similar size, and have at least 150 mm clearance above their heads. Sufficient space should be available to allow all animals to sit. If it is necessary to tie the legs during transport, the animals should be released and allowed to stand at least every 4 hours. Camels may be transported for up to 3 days in suitably constructed single-deck trucks that provide shade and allow daily feeding. Water is not essential, but is desirable.

If slaughter is necessary during a disease emergency, camels can be processed in standard cattle facilities, provided there is sufficient clearance. Minimum heights are 1.8 m for races, 2.4 m for overhead doorways and 2.8 m for slaughter rails.

For body condition scoring of camels, see Appendix 1.1 of the *Australian Standards for the Export of Livestock* (DAFF 2005). The *Model Code of Practice for the Welfare of Animals – The Camel* also provides further useful information.¹³

4.9.2 Llama and alpaca

Llamas are the largest of the South American camelids, weighing up to 130–210 kg. Traditionally, they have been used to carry packs and pull carts; they can also be used as guards to protect sheep against foxes and dogs. Llamas are also raised for

¹³ <http://www.publish.csiro.au/nid/22/pid/1499.htm> (Accessed 12 March 2007)

their hair, although it is not as fine as that of the alpaca. They are very adaptable and can withstand harsh conditions, although they do not tolerate high humidity.

The average lifespan of the llama is 15–30 years, and females first breed at 15–18 months. The gestation period is 350 days, with a single cria (pronounced *cree-ah*) born. Crias should be standing and nursing within an hour, and are usually weaned at 4–6 months.

Alpacas are less than half the size of llamas, and are prized for the fineness and strength of their hair. They are docile and can be easily halter trained. Australia's modern alpaca industry began in the late 1980s with the import of animals from Chile. Recent imports from Peru will add to the genetic pool here.

Alpacas appear to be ideally suited to environments similar to those used for wool sheep, although alpacas require more dietary fibre and can utilise coarse fibrous roughage better than sheep. Like llamas, they can tolerate harsh conditions, but dislike high humidity levels.

In general, the nutritional requirements of llamas are similar to those of sheep. Recommended maintenance protein levels are 8–10% of dry matter in the diet, increasing to 12–14% during pregnancy and lactation. Pasture and hay should comprise the bulk of the diet, and fresh water is necessary. Feed requirements of the other smaller camelids are similar; the amounts required depend on bodyweight.

Llamas and alpacas communicate through their posture and ear and tail movements. Although generally docile, they can show aggression by foot stamping, kicking and spitting – the latter behaviour usually directed at other animals. They are social animals and prefer to be run in groups.

Routine husbandry practices include annual vaccinations, drenches, toenail clipping (every 3 months, depending on terrain) and shearing. During an EAD response, these should not be neglected.

5 Livestock in transit

In the event of a 'worst case' emergency animal disease (EAD) outbreak, where foot-and-mouth disease is detected, all livestock movements would be immediately halted for at least 72 hours in a stock 'standstill'. Completion of journeys or the return of stock to properties of origin, under permit, would be allowed. The major risk to animal welfare during this period is likely to be the risk to bobby calves held at saleyards, as the welfare of adult animals is unlikely to be compromised within that timeframe. Nonetheless, it should be a high priority to identify and deal with any urgent welfare problem that arises in this period – for example, problems caused by extreme weather conditions.

After a 72-hour standstill, welfare risks are likely to be associated with animals retained in saleyards while the diagnosis and/or extent of an outbreak are clarified.

If a horse movement standstill were declared, special arrangements would have to be made for horses in transit (by road and air), and also for the transport of sick or injured animals to veterinary hospitals or knackeries.

For animals being transported by road, the welfare risks will depend on the particular circumstances, weather conditions and elapsed time from the start of the journey. Animals aboard ships might face particular welfare risks, for which special solutions will have to be found.

5.1 Saleyards

Saleyards are stockyards, owned privately or by a local government authority, at which various types of sales are conducted:

- fat sales, where stock are primarily intended for slaughter;
- store sales, where stock are mainly intended for purchase by other producers for fattening or breeding;
- stud sales, where stock are sold mainly for breeding or racing purposes;
- bobby calf selling/assembly points.

Special, infrequent sales that may be held in conjunction with agricultural shows or field days are not considered in this manual.

The voluntary National Saleyards Quality Assurance (NSQA) program has been widely adopted by many saleyards, and requires acceptable welfare standards to be maintained.

In normal circumstances, once incoming animals are unloaded, the person in charge of the saleyards effectively becomes their custodian, and assumes primary responsibility for the animals' welfare while they are on the premises. All workers employed at the saleyards should also accept personal responsibility for maintaining acceptable standards of animal welfare. In addition, the owner of the animals or their (stock) agent should check that animals are properly treated.

Saleyards represent a particularly high risk for the spread of an EAD, as detailed in the **Saleyards and Transport Enterprise Manual**. Live animals, people, vehicles, vectors, wind, fomites and effluent are all potential risks.

When an EAD is detected and a standstill declared, animals may already be yarded, trucks may be arriving to unload, or a sale may have finished and the dispersal of animals may have begun. The chief veterinary officer (CVO) must decide on the conditions under which animals can be safely removed from saleyards, or on any alternative action to be taken. When an EAD alert is declared, it is likely the CVOs will use their powers under emergency diseases legislation to order the suspension of all movements and selling activity. In most situations, a site supervisor would be appointed to control all activities at the saleyard.

From a welfare perspective, saleyards should be regarded as a high priority, especially if calves or other young animals have to be retained for extended periods. The site supervisor will have primary responsibility for the welfare of all animals at the saleyards, including any dogs or horses. However, the duty of care for welfare should extend also to the veterinary investigation team and any saleyard personnel who are seconded to assist with management of the animals.

Each saleyard should have a contingency plan in place that details the local response to an animal disease emergency. An emergency shutdown plan should include appropriate animal welfare provisions. Internal quarantine facilities should be available to isolate sick animals or groups containing sick animals. Local veterinary services should be arranged for the saleyards; veterinary personnel should be familiar with all relevant aspects of animal handling and saleyard management practices, and be able to make informed decisions if an EAD is suspected. These veterinarians should also know the welfare requirements of different classes of livestock.

5.1.1 Noninfected saleyards within a declared area

A saleyard might be in a restricted area (RA) or a wider control area (CA), but not have any clinical or suspected cases that would cause it to be classified as an infected premises (IP) or dangerous contact premises (DCP). However, at least in the initial stages of most disease outbreaks affecting non-avian species, all saleyards will be treated as suspect and all selling activity will be suspended.

If there is a sale in progress, the CVO must make several important, rapid decisions. Regardless of whether or not the CVO orders a sale to be stopped, duty of care for animals' welfare rests with the owner or custodian at any particular time.

All sales within an RA would be prohibited. Following a thorough assessment of the disease spread, it is possible that some auction sales might be permitted within a CA. However, since direct selling systems are widely available, the congregation of stock in saleyards, with the attendant risks, should be discouraged. Direct selling also offers significant welfare benefits for the animals, and is the preferred option.

Depending on the disease involved, it might be necessary to hold animals in quarantine, within the saleyards, for an extended period – at least until the incubation period for that disease has passed. In this situation, it will be essential to provide all animals with adequate food and water. If the yards are full, additional temporary pens, which will effectively be an extension of the quarantine area, should be provided. Generally, saleyards are not designed for prolonged

accommodation of stock, and the need for shelter and bedding should be considered.

Special attention should be paid to the welfare needs of bobby calves and any other young animals (see Section 4.1.3). If calves cannot be fed a commercial milk replacer every 10 hours, they should be euthanased as soon as possible.

Arrangements should be made for disposal of manure, which will usually become a problem after about 3–5 days.

Some movement for welfare purposes may be allowed out of RAs, and within and out of CAs, under permit and appropriate supervision.

5.1.2 Saleyards as infected premises or dangerous contact premises

In the event that a saleyard is found to contain either infected or suspect animals, or animals known to have been in direct contact with infected animals, the yard will be declared an IP, DCP or SP. The immediate priority will be to minimise the risk of disease spread from the suspect stock and contacts, within and beyond the saleyard.

In the case of a highly infectious disease, where animals could be producing large amounts of infectious material, it is highly likely that all animals in a saleyard complex will be ordered for immediate slaughter. Salvage slaughter for noncontact animals, if feasible, is obviously the preferred option.

If salvage slaughter at a nearby abattoir is not feasible, immediate slaughter on site will be necessary, as detailed in the **Destruction Manual**. Where the saleyard is located on the periphery of a town or built-up area, it might be necessary to arrange transport of carcasses to a more suitable disposal site (see the **Saleyards and Transport Enterprise Manual**).

All animals retained in the saleyards should be provided with water within 24 hours of their last access to water (and within 12 hours for young or lactating stock, or in very hot weather). If slaughter will not begin within 48 hours of arrival, appropriate feed should be provided, as detailed for the respective species in Section 4. Special attention should be paid to the welfare needs of bobby calves and any other young animals (see Section 4.1.3). If calves cannot be fed a commercial milk replacer every 12 hours, they should be euthanased as soon as possible.

5.1.3 Saleyards as emergency accommodation

Any sales or other events where stock are aggregated will be prohibited in the RA, and the saleyard facilities will remain idle. During a prolonged EAD response, the saleyard could be a useful resource for short- to medium-term housing of livestock, especially cattle, sheep, goats and pigs. If such use is being contemplated, the following aspects may need to be considered:

- ownership of the yards, and any fees payable;
- security, including boundary fences and arrangements for on-site supervision;
- insurance cover, including public liability;
- possible need for structural modifications, such as shelter or troughing;
- possible need for bedding, if floors are hard-paved;

- need for cleaning and disinfection before any stock are introduced, and after removal;
- arrangements for manure removal;
- water supply; and
- short-term storage of feed on site.

If saleyards are used in this way, the status of the premises should not be jeopardised, and only low-risk stock should be introduced.

5.2 Land transport

The land transport of animals throughout Australia is a significant industry involving many operators working in different situations. The driver usually has primary responsibility for the welfare of the stock being carried. The Australian Livestock Transporters Association has introduced Truck Care, a voluntary quality assurance system that incorporates specific provisions for animal welfare.

Consistent with current industry best practice, operators are required to plan their journeys to ensure that they comply with relevant standards for animal health and welfare. The maximum acceptable travel times for different species, maximum water deprivation times and loading densities are described in Appendixes 2.1 and 2.2 of the *Australian Standards for the Export of Livestock* (DAFF 2005).

The detection of an EAD and the resulting 72-hour standstill (for foot-and-mouth disease) will cause considerable disruption to the road transport industry, and it is likely that many animals could be held on trucks for extended periods. These situations should be treated as high priority for animal welfare, and every effort should be made to offload stock and provide feed, water and shelter at the earliest opportunity.

During the standstill, it will be necessary to carry out a risk assessment for each consignment that is halted at a road checkpoint, and this will determine its further movement. As a general rule, any livestock truck that has completed less than half the proposed journey should be directed to return to the property of origin.

Alternatively, it might be necessary to direct the truck to suitable premises or yards where the stock can be unloaded, fed and watered as soon as practicable.

5.3 Travelling stock routes

If an EAD is detected and a national standstill is declared, it will be necessary to identify all mobs of travelling stock, their location, the type and source of the animals, ownership, and contact details for the droving team. Based on this information, a risk assessment will be conducted and a decision made about the fate of each mob.

If the mob is designated as either an IP or DCP and destruction is ordered, immediate slaughter, probably using temporary yards erected in situ, will be necessary. However, if the disease status remains undetermined beyond the

standstill period, or if the animals are not infected, alternative options will be considered.

Depending on the particular disease involved, the mob's location (within or outside the RA), feed availability and proximity to an abattoir, there will be four likely possibilities:

- movement to an abattoir for salvage slaughter;
- agistment, if available within a reasonable distance;
- movement to stockyards (for feedlotting), if available; and
- continued movement on the stock route, under permit.

The welfare of any noninfected mob on a stock route within an RA should be treated as a high priority. After consultation with the animal welfare officer, the restricted area movement and security manager will discuss possible options with the owner and head drover before recommending appropriate action, taking into account disease eradication priorities.

5.4 Sea transport

The livestock export trade involves significant challenges and risks, especially in maintaining acceptable standards of animal welfare. This applies particularly to long-distance voyages (> 10 days) at particular times of the year. The livestock industries, government and various community groups have collaborated in the development of the *Australian Standards for the Export of Livestock* (DAFF 2005) to address these risks. The standards provide detailed information on loading densities, penning arrangements, nutritional requirements and veterinary supplies for cattle, sheep, goats, deer and camelids.

In the event that a high-risk EAD is detected on the Australian mainland, it will be necessary to conduct a thorough risk assessment for any shipment that is at sea. Decisions about the destinations of these animals are likely to involve complex biosecurity assessments and negotiations with many stakeholders – issues that are beyond the scope of this manual.

5.5 Air transport

Animals have been transported by air since the 1930s. The value of animals being transported by air usually means that every effort is made to ensure that welfare needs are met. Almost all movements of animals by air are completed within 24 hours, and there are rarely any significant welfare problems.

The International Air Transport Association (IATA) has developed the Live Animals Regulations, which set out the international standards for the acceptance and handling of animals (IATA 2005). The regulations specify the minimum requirements for international carriage of live animals and the precautionary measures to be taken on the ground and in the air. These detailed and stringent requirements are widely accepted as the benchmark for transport by air.

If an EAD response occurs while an inward- or outward-bound consignment is in the air, the small numbers of animals involved and the strict biosecurity protocols in place should ensure that acceptable welfare standards are maintained.

Table 14 Animal welfare alert: animals in saleyards and in transit

Problem	Minimum requirements	Suggested action
Feed	Refer to minimum requirements for each species, especially for young stock	Owner, agent and/or custodian to make arrangements for remedial action. Euthanase any weak or recumbent animal.
Water	See recommendations for each species	Monitor according to species recommendations, especially in hot weather
Space	See recommended minimum requirements for each species	Watch for signs of atypical behaviours, aggression, collapse
Shelter	Adequate shelter, providing protection from extreme weather conditions	
Manure accumulation	Manure should be removed every 48-72 hours	If necessary, employ contractor

Appendix 1 Checklist of animal welfare issues to consider in an EAD response

This checklist highlights situations in an RA or CA in which there is a higher risk that animal welfare will be compromised during an EAD response. It is suggested that monitoring activity be targeted accordingly.

The checklist could be adapted to form the framework for routine reports within the LDCC.

Abattoirs

- Bobby calves and other young animals held in lairage will require special attention.

Absentee owners

- Particular attention should be paid to situations where animals are not under continuous supervision, especially during hot weather or drought conditions.

Dairies

Cattle dairies

- Maintain normal milking routine. Check disposal of milk.
- Calf rearing: may have to retain bobby calves on site.

Vealer production

- Maintain ongoing nutritional requirements and high standard of husbandry.

Sheep and goat dairies

- Maintain daily milking routine. Check disposal of milk.
- Maintain adequate level of nutrition and care for animals in advanced pregnancy
- May have to retain surplus lambs or kids on site.

Feedlots

Beef feedlots

- Finishing stock require adequate space.
- Check access to slaughter facilities.
- Check feed availability.

Other species

- Permanent or temporary feedlots may be established to assist supplementary feeding (sheep, goats, deer, etc).

Feedstuffs

- It is illegal to feed cattle any compounded rations or rendered products that include meat and bonemeal derived from vertebrates (including fish and birds) under any circumstances. The potential risk of chemical residues in feed from unknown sources should be considered.

Imminent slaughter

- Based on experience in the United Kingdom, some owners whose stock are destined for imminent emergency or welfare slaughter may neglect the animals' welfare.

Inexperienced owners or managers

- An inexperienced owner or manager of a livestock production enterprise will be placed under additional stress and pressure, and may require additional assistance. This may especially apply to managers of less common species, such as ratites, alpacas, etc.

Livestock exports

- Welfare requirements for each stage of the export process are set out in the *Australian Standards for the Export of Livestock* (DAFF 2005).

Piggeries

Intensive piggeries

- Space requirements of finishing growers should be carefully monitored. Overcrowding will cause aggressive behaviours and poor health.
- Check feed availability.

Outdoor piggeries

- Pigs run in free-range situations are vulnerable to climatic extremes and also a variety of disease and metabolic conditions. Recommended stocking densities should not be exceeded.

Poultry enterprises

Meat chickens

- Broilers reaching slaughter weight will require 'thin-outs' based on sample weighings.
- Check feed availability.

Layer enterprises

- Consider disposal of spent hens at end of lay.

Racecourses and equestrian venues

- If a race meeting or equestrian event is in progress, immediate action may be required if horses are detained on the premises for a prolonged period.
- Additional feed, water and space may be required.

Saleyards

- Bobby calves require urgent attention, including feeding every 12 hours.
- If a sale is in progress and/or yards are near capacity, immediate action is required to control the premises and animal welfare.
- If not declared as an infected premises, provision for more space, food and water may be required.

Small landholders

- Limited numbers of individual livestock held on smallholdings ('hobby farms') may be overlooked during an EAD response. Neighbours should be encouraged to report situations where welfare is compromised.

Transit — offloaded stock in yards

- Where stock have had to be offloaded from trucks before completion of a journey, appropriate arrangements must be made for provision of feed and water.
- Drivers are required to notify the SDCHQ if there are difficulties in unloading stock or prolonged delays in completing a journey.

Travelling stock routes

- Depending on the particular disease, any travelling mob within an RA or CA should be identified and its welfare closely monitored, especially if feed is short.

Zoos, wildlife parks

- Zoos and wildlife parks may hold a range of potentially susceptible species. Check ongoing availability of feedstuffs. Consider financial implications in event of an extended closure.

Appendix 2 Example of an information sheet

NOTE: THIS EXAMPLE IS FOR GUIDANCE ONLY, AND SHOULD BE MODIFIED AS APPROPRIATE TO SUIT LOCAL CIRCUMSTANCES.

FACT SHEET

Animal Management and Welfare in a Disease Emergency

— Important Information —

An emergency animal disease outbreak creates significant difficulties for all livestock industries, especially owners of properties in areas where disease control activities are under way.

At a time when everyone is under a lot of stress, it is important that the welfare of animals is not neglected. Primary responsibility for the welfare of animals during an emergency (as well as at other times) rests with their owner or custodian.

At the local disease control centre, an animal welfare officer (AWO) is responsible for assessing any welfare problems that arise on identified 'high-risk welfare' properties in the restricted area. The AWO will work closely with a local industry representative (industry liaison officer) and the owners of affected properties in making recommendations to disease control authorities.

Checking stock

In all livestock production, good husbandry is always important. During an emergency, it is especially important to maintain high standards of husbandry and provide adequate labour to meet the animals' health and welfare needs. As far as practicable, experienced personnel should not be diverted to other work.

All stock should be checked as frequently as possible – preferably daily for most properties. Everyone handling livestock should be especially alert for any unusual signs of disease, including reduced feed intake. Normal animal husbandry programs should be adjusted to deal with the particular circumstances and restrictions imposed by the emergency.

Checking equipment

All feeding and watering equipment should be maintained in good working order, and all these systems should be checked regularly – at least daily in intensive livestock enterprises. The owner or manager is responsible for prompt and accurate reporting to the AWO of any incident or circumstance that will have a significant effect on animal welfare, such as a prolonged power failure or mechanical breakdown of feeding, watering or ventilation equipment that cannot be rectified within a reasonable time.

Disease control and animal welfare

Owners and managers of properties in the restricted area will be required to comply with various directions under the disease control plan, and field surveillance teams and other personnel will be responsible for completion of those actions. The AWO will provide advice and assistance to the disease control authorities, aimed at avoiding the development of any unacceptable welfare situation.

Where there appears to be a welfare risk, the AWO will draw on additional expertise (eg nutritionists or species specialists) as necessary. The AWO will also explore management options for each property. These might include:

- sourcing additional or unconventional feedstuffs;
- suspending breeding programs;
- adjusting feeding programs (feeding to maintenance where possible);
- using other areas of the property, perhaps temporary yards;
- agistment within the restricted area;
- movement of animals under permit outside the restricted area for sale or slaughter (depending on the particular circumstances);
- partial or total culling by:
 - movement under permit to an abattoir,
 - salvage slaughter at a knackery or pet food processor,
 - on-farm welfare slaughter, as a last resort.

In the event that a possible welfare problem is identified, owners and managers will be expected to cooperate with the AWO and industry liaison officer in arriving at an acceptable plan that avoids the problem.

Property information

In order to assess animal welfare priorities, the AWO needs reliable information about those properties that appear to have a high welfare risk. Owners or managers should ensure that the following details are as accurate as possible:

- numbers, types (classes) of livestock;
- feed requirements (weekly);
- feed on hand and alternative sources;
- normal sources of feed;
- available water;
- other potential problems (eg disposal of waste, manure); and
- any incident affecting animal welfare (eg extended breakdown of equipment, power failure).

Biosecurity

All visitors entering your property should accept personal responsibility for their role in animal health and welfare, and act in accordance with appropriate disease prevention and biosecurity practices.

KEY CONTACT DETAILS

Local disease control centre – [Telephone numbers]

Animal welfare officer – [Name, telephone number, email address]

Industry liaison officer – [Name, telephone number, email address]

Appendix 3 State and territory animal welfare legislation

(URLs accessed 12 March 2007)

Australian Capital Territory

Animal Welfare Act 1992

Animal Welfare Regulation 2001

<http://www.legislation.act.gov.au/>

New South Wales

Prevention of Cruelty to Animals Act 1979

Prevention of Cruelty to Animals (General) Regulation 1996

<http://www.legislation.nsw.gov.au/maintop/scanact/inforce/NONE/0>

Northern Territory

Animal Welfare Act 1999

Animal Welfare Regulations 2000

<http://notes.nt.gov.au/dcm/legislat/legislat.nsf?OpenDatabase>

Queensland

Animal Care and Protection Act 2001

Animal Care and Protection Regulation 2002

<http://www.legislation.qld.gov.au/OQPChome.htm>

South Australia

Prevention of Cruelty to Animals Act 1985

Prevention of Cruelty to Animals Regulations 2000

<http://www.legislation.sa.gov.au/index.aspx>

Tasmania

Animal Welfare Act 1993

Animal Welfare Regulations 1993

<http://www.thelaw.tas.gov.au/index.w3p>

Victoria

Prevention of Cruelty to Animals Act 1986

Prevention of Cruelty to Animals Regulations 1997

http://www.dms.dpc.vic.gov.au/Domino/Web_Notes/LDMS/PubLawToday.nsf?OpenDatabase

Western Australia

Animal Welfare Act 2002

Animal Welfare (General) Regulations 2003

<http://www.slp.wa.gov.au/statutes/swans.nsf>

Glossary

Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser).
Animal Health Committee	A committee comprising the CVOs of Australia and New Zealand, Australian state and territory CVOs, Animal Health Australia, and a CSIRO representative. The committee provides advice to PIMC on animal health matters, focusing on technical issues and regulatory policy (formerly called the Veterinary Committee). <i>See also</i> Primary Industries Ministerial Council (PIMC)
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Australian Chief Veterinary Officer	The nominated senior veterinarian in the Australian Government Department of Agriculture, Fisheries and Forestry who manages international animal health commitments and the Australian Government's response to an animal disease outbreak. <i>See also</i> Chief veterinary officer
AUSVETPLAN	<i>Australian Veterinary Emergency Plan</i> . A series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. <i>See also</i> Australian Chief Veterinary Officer
Compensation	The sum of money paid by government to an owner for stock that are destroyed and property that is compulsorily destroyed because of an emergency animal disease. <i>See also</i> Cost-sharing arrangements, Emergency Animal Disease Response Agreement
Consultative Committee on Emergency Animal Diseases (CCEAD)	A committee of state and territory CVOs, representatives of CSIRO Livestock Industries and the relevant industries, and chaired by the Australian CVO. CCEAD convenes and consults when there is an animal disease emergency due to the introduction of an emergency animal disease of livestock, or other serious epizootic of Australian origin.

Control area	A declared area in which the conditions applying are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an outbreak according to need).
Cost-sharing arrangements	Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. <i>See also Compensation, Emergency Animal Disease Response Agreement</i>
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises	Premises that contain dangerous contact animals or other serious contacts.
Declared area	A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. Types of declared areas include <i>restricted area, control area, infected premises, dangerous contact premises and suspect premises</i> .
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.
Destroy (animals)	To slaughter animals humanely.
Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases – 1800 675 888
Disinfectant	A chemical used to destroy disease agents outside a living animal.
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of animal diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disposal	Sanitary removal of animal carcasses, animal products, materials and wastes by burial, burning or some other process so as to prevent the spread of disease.

Emergency animal disease	A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications. <i>See also</i> Endemic animal disease, Exotic animal disease
Emergency Animal Disease Response Agreement	Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include funding mechanisms, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. <i>See also</i> Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia. <i>See also</i> Emergency animal disease, Exotic animal disease
Enterprise	<i>See</i> Risk enterprise
Epidemiological investigation	An investigation to identify and qualify the risk factors associated with the disease. <i>See also</i> Veterinary investigation
Exotic animal disease	A disease affecting animals (which may include humans) that does not normally occur in Australia. <i>See also</i> Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals	<i>See</i> Wild animals
Fomites	Inanimate objects (eg boots, clothing, equipment, instruments, vehicles, crates, packaging) that can carry an infectious disease agent and may spread the disease through mechanical transmission.
In-contact animals	Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of the pathogen into the animal and the first clinical signs of the disease.
Index case	The first or original case of the disease to be diagnosed in a disease outbreak on the index property.
Index property	The property on which the first or original case (index case) in a disease outbreak is found to have occurred.

Infected premises	A defined area (which may be all or part of a property) in which an emergency disease exists, is believed to exist, or in which the infective agent of that emergency disease exists or is believed to exist. An infected premises is subject to quarantine served by notice and to eradication or control procedures.
Local disease control centre (LDCC)	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population. <i>See also</i> Surveillance
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.
National management group (NMG)	A group established to direct and coordinate an animal disease emergency. NMGs may include the chief executive officers of the Australian Government and state or territory governments where the emergency occurs, industry representatives, the Australian CVO (and chief medical officer, if applicable) and the chairman of Animal Health Australia.
Native wildlife	<i>See</i> Wild animals
OIE Terrestrial Code	<i>OIE Terrestrial Animal Health Code</i> . Reviewed annually at the OIE meeting in May and published on the internet at: http://www.oie.int/eng/normes/mcode/a_summry.htm
OIE Terrestrial Manual	<i>OIE Manual of Standards for Diagnostic Tests and Vaccines for Terrestrial Animals</i> . Describes standards for laboratory diagnostic tests and the production and control of biological products (principally vaccines). The current edition is published on the internet at: http://www.oie.int/eng/normes/mmanual/a_summry.htm
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.

Primary Industries Ministerial Council (PIMC)	The council of Australian national, state and territory and New Zealand ministers of agriculture that sets Australian and New Zealand agricultural policy (formerly the Agriculture and Resource Management Council of Australia and New Zealand). <i>See also</i> Animal Health Committee
Quarantine	Legal restrictions imposed on a place or a tract of land by the serving of a notice limiting access or egress of specified animals, persons or things.
Restricted area	A relatively small declared area (compared to a control area) around an infected premises that is subject to intense surveillance and movement controls.
Risk enterprise	A defined livestock or related enterprise, which is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, AI centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges, garbage depots.
Sensitivity	The proportion of affected individuals in the tested population that are correctly identified as positive by a diagnostic test (true positive rate). <i>See also</i> Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Specificity	The proportion of non-affected individuals in the tested population that are correctly identified as negative by a diagnostic test (true negative rate). <i>See also</i> Sensitivity
Stamping out	Disease eradication strategy based on the quarantine and slaughter of all susceptible animals that are infected or exposed to the disease.
State or territory disease control headquarters	The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.
Surveillance	A systematic program of investigation designed to establish the presence, extent of, or absence of a disease, or of infection or contamination with the causative organism. It includes the examination of animals for clinical signs, antibodies or the causative organism.
Susceptible animals	Animals that can be infected with a particular disease.

Suspect animal	An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, is warranted. <i>or</i> An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises	Temporary classification of premises containing suspect animals. After rapid resolution of the status of the suspect animal(s) contained on it, a suspect premises is reclassified either as an infected premises (and appropriate disease-control measures taken) or as free from disease.
Tracing	The process of locating animals, persons or other items that may be implicated in the spread of disease, so that appropriate action can be taken.
Vaccination	Inoculation of healthy individuals with weakened or attenuated strains of disease-causing agents to provide protection from disease.
Vaccine	Modified strains of disease-causing agents that, when inoculated, stimulate an immune response and provide protection from disease.
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A <i>biological</i> vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A <i>mechanical</i> vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. <i>See also</i> Epidemiological investigation
Wild animals	
- native wildlife	Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).
- feral animals	Domestic animals that have become wild (eg cats, horses, pigs).
- exotic fauna	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Zoning	The process of defining disease-free and infected areas in accord with OIE guidelines, based on geopolitical boundaries and surveillance, in order to facilitate trade.
Zoonosis	A disease of animals that can be transmitted to humans.

Abbreviations

AAHL	Australian Animal Health Laboratory
ANEMIS	Animal Health Emergency Information System
AQIS	Australian Quarantine and Inspection Service
AUSVETPLAN	Australian Veterinary Emergency Plan
AWC	animal welfare coordinator
AWO	animal welfare officer
BCS	body condition score
CA	control area
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
DAFF	Department of Agriculture, Fisheries and Forestry (Australian Government)
DCP	dangerous contact premises
EAD	emergency animal disease
ILO	industry liaison officer
IP	infected premises
LDCC	local disease control centre
NFAS	National Feedlot Accreditation Scheme
NMG	national management group
OIE	World Organisation for Animal Health (Office International des Epizooties)
PIMC	Primary Industries Ministerial Council
RA	restricted area
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SDCHQ	state or territory disease control headquarters
SP	suspect premises

References

- Carroll CL and Huntington PJ (1988). Body condition scoring and weight estimation of horses. *Equine Veterinary Journal* 20:41-45.
- DAFF (Department of Agriculture, Fisheries and Forestry) (2005). *Australian Standards for the Export of Livestock*, Version 1. DAFF, Canberra.
<http://www.animalhealthaustralia.com.au/aahc/index.cfm?F2DF2A45-9869-8D83-1FCF-EDA9E5D0721B> (Accessed 12 March 2007).
- Gonyou HW and Stricklin WR (1998). Effects of floor area allowance and group size on the productivity of growing/finishing pigs. *Journal of Animal Science* 76(5):1326-1330.
- IATA (International Air Transport Association) (2005). *Live Animals Regulations*. 31st edition. <http://www.iata.org/ps/publications/9105.htm> (Accessed 12 March 2007).
- Moran J, Kyabram (2006). *Weighing and Condition Scoring Replacement Heifers and Dairy Cows*, Agriculture Note AG0505, Victorian Department of Primary Industries.
[http://www.dse.vic.gov.au/dpi/nreninf.nsf/9e58661e880ba9e44a256c640023eb2e/e040f5688aa90bb0ca257181001f62a0/\\$FILE/AG0505.pdf](http://www.dse.vic.gov.au/dpi/nreninf.nsf/9e58661e880ba9e44a256c640023eb2e/e040f5688aa90bb0ca257181001f62a0/$FILE/AG0505.pdf) (Accessed 12 March 2007).
- Suiter J (2006). *Body Condition Scoring of Sheep and Goats*. Farmnote 69/1994 [Reviewed July 2006], Department of Agriculture, Western Australia.
http://www.agric.wa.gov.au/servlet/page?_pageid=449&_dad=portal30&_schema=PORTAL30&_p_start_url=/pls/portal30/docs/FOLDER/IKMP/AAP/SL/M/FN069_1994.HTM (Accessed 12 March 2007).
- Whiting TL (2003). Foreign animal disease outbreaks, the animal welfare implications for Canada: Risks apparent from international experience. *Canadian Veterinary Journal* 44:805-815.

Further reading

National Guidelines for Beef Cattle Feedlots in Australia (1998) No. 47, 2nd Edition. CSIRO Publishing. <http://www.publish.csiro.au/nid/22/pid/114.htm> (Accessed 12 March 2007).

Australian Model Codes of Practice for the Welfare of Animals. CSIRO Publishing. <http://www.publish.csiro.au/nid/22/sid/11.htm> (Accessed 12 March 2007).

- Animals at Saleyards (1991)
- Buffalo, Farmed (1995)
- Camel (1997)
- Cattle (2004)
- Cattle, Land Transport of (1999)
- Deer, Farming of (1991)
- Emus, Husbandry of Captive-Bred (1999)
- Feral Animals, Destruction or Capture, Handling and Marketing of (1991)
- Goat ((1991)
- Horses, Land Transport of (1997)
- Livestock, Air Transport of (1986)
- Livestock, Rail Transport of (1983)
- Livestock, Road Transport of (1983)
- Livestock, Sea Transport of (1987)
- Livestock at Slaughtering Establishments (2001)
- Ostriches, Farming of (2003)
- Pig (1998)
- Pigs, Land Transport of (1997)
- Poultry, Domestic (2002)
- Poultry, Land Transport of (1998)
- Rabbits, Intensive Husbandry of (1991)
- Sheep (1991)

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