Bovine Johne’s Disease (BJD) Risk Assessment Protocol for Beef Cattle Herds

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Animal Health Australia

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Executive Summary

Animal Health Australia (AHA) has commissioned Hassall & Associates to develop a Bovine Johne’s Disease (BJD) Risk Assessment Protocol for Beef Cattle Herds.

The aims of the risk protocol are to:

- Facilitate trade and limit disease spread by:
  - Providing protection from disease and, as far as possible, opportunities for infected herd owners to trade;
  - Providing awareness of levels of risk (avoid misinformation); and
  - Enhancing testing and management of the disease.

- Capture potential market benefits and position the Australian Beef Industry to respond to increasing international requirements of food safety.

A risk protocol represents a fundamental shift in paradigm. It is commonly referred to as a risk based trading system. Such a system puts the responsibility with the producer that is introducing the cattle (a user-based system). It will rely on a much closer vendor/purchaser relationship.

Regardless of the regulatory environment, producers can use risk protocols to better inform their decisions. To varying degrees, producers already take into account some of the risks (e.g. not purchasing from certain areas). As knowledge increases, as well as use of the protocol, there are opportunities to shift to a more industry-based program, rather than the current regulatory approach based on movement restrictions.

One driver of the likelihood of beef cattle having BJD is the degree of contact with dairy cattle. Many beef cattle operations, with limited introductions, will not have had contact. Defining a Beef-Only herd that has had no (or limited) contact with dairy cattle is one way that the risks can be identified and isolated. This can then help achieve the aims of the risk protocol, particularly to help limit disease spread and facilitate trade. The proposed risk protocol uses a definition of a Beef-Only herd that is based on the requirements of the BC-TAS scheme.

Risk protocol

The protocol has two parts:

PART 1: Determine YOUR situation and needs for stock introductions:
- Ask relevant questions.

PART 2: Determine the risks associated with THE SELLER’S herd:
- Complete an Animal Health Statement;
- Determine the level of risk;
- Compare buyer and seller risk scores; and
- Introduce cattle, complete further investigation or source alternate stock.

The layout of the protocol should match the current National Vendor Declaration, with an explanation of the protocol (Parts 1 and 2) at the start of an A4 landscape booklet, and then the Animal Health Statement as a series of forms that can be detached and/or completed by the vendor. This layout was preferred amongst the people consulted as part of the study.

The full risk protocol is presented in Chapter 4 of this report.
Implementation

This study has shown a high degree of support for a risk based trading system and consequently for a tool such as the risk protocol. The risk assessment must be practical and easy to understand and adopt, so that errors in completing the risk assessment are minimised. However, there are significant implementation issues.

Producer engagement: A risk-based approach is very dependent on producer engagement and adoption of the program. Producers appear to not understand BJD risks at present or how to implement risk-assessment and risk-management measures to reduce their risk. Until the awareness and understanding is changed, producers are unlikely to be able to adequately implement any risk-based trading program effectively. The demonstration of market significance, such as market premiums/benefits, is essential. Some form of incentives for producers to participate may be necessary to increase uptake.

Education and communication: An effective education and communication program must be a critical component of any move to risk-based trading for BJD. A major change in producer attitudes will be required to achieve widespread support, understanding and adoption of the program by producers, particularly those introducing stock. Case studies and the demonstration of the use of the system for different types of producers are likely to be useful to inform any resultant communication/education program. Dealing with periods with short supply of stock is important, so that BJD risk is not ignored when other factors become important. It will be important to communicate that low risk does NOT mean BJD free or Zero risk. It will be important to consider and build on the measures currently included in the National BJD Program. It is anticipated that the communication should be largely industry driven and utilise existing networks.

Vendor declaration and auditability: A declaration is needed to support the risk assessment. Auditing is needed to give confidence to producers that the declarations are meaningful. The need for auditing will require increased paperwork for producers not already participating in CattleMAP or Cattlecare, creating a deterrent to participation.

Voluntary vs compulsory declarations: Voluntary declarations are expected to be more meaningful however may have poor uptake. Compulsory declarations require legislative changes to compel their use and enforcement measures to ensure that they are actually used, at significant cost to governments and industry. In addition, compulsory declarations are not likely to be as effective if people are only using them because they are required to, without utilising the information provided to assist in risk-management. Regardless of whether the declaration is voluntary or compulsory, it is essential that any BJD declaration is supported under each jurisdiction’s relevant stock disease legislation, to provide better protection against false declarations.

National Livestock Identification Scheme (NLIS): Participation in NLIS was identified as an important issue to support auditability of the program.

Zoning and State requirements: Risk-based trading has the potential to allow fewer restrictions on cattle movement where trading is currently restricted. It also raises questions about whether the current movement restrictions and regulatory approach would be needed. An interim period with the two systems running concurrently would add to the real and perceived bureaucracy of BJD administration (i.e. would not work). This suggests that decisions on zoning would need to be made prior to the implementation of the scheme.
Potential effect on CattleMAP, BC-TAS and testing: Risk-based trading could easily have a detrimental effect on participation in the CattleMAP and BC-TAS programs.

Differentiation of dairy and beef MAP herds: The proposed risk-assessment approach includes a differentiation of Beef-Only herds as being a lower risk than non Beef-Only herds of the same status, including for herds in the CattleMAP. This approach could create problems for CattleMAP at a later date by the development of a perceived different level of assurance for herds of equal status.

Pathways out of infection: The current risk protocol does not adequately address the issue of what trading options an infected producer has, nor how to change from having a high risk herd (apart from testing). The National BJD Program, as appropriate, should further address this issue.

Recommendations

The recommendations for this study are:

- Cattle Council of Australia and Animal Health Australia consider and consult widely regarding the risk protocol. The risk protocol, along with shifts to a risk based trading system, should be considered in conjunction with other initiatives such as financial assistance and testing rebates. Risk based trading is likely to complement these initiatives rather than provide an alternative, especially in the short run.

- The BJD Technical Advisory Group should complete its investigations about the level of risk posed by Beef-Only herds. The risk protocol may need to be modified as a result.

- Animal Health Australia and Cattle Council of Australia should consider the implementation issues raised, particularly demonstration of benefit, producer engagement and communication, zoning and impacts on CattleMAP. These issues will have a significant bearing on how the scheme can be developed and presented, as well as on its uptake and success.

- Animal Health Australia and Cattle Council of Australia should consider more substantive field testing and a trial implementation period before wider roll-out of risk protocols.

- Animal Health Australia and Cattle Council of Australia should consider commissioning a study to analyse the communication needs to implement risk protocols and to identify appropriate case studies. Case studies and the demonstration of the use of the system for different types of producers are likely to be useful to inform any resultant communication campaign.
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DISCLAIMER

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1. Introduction

Animal Health Australia (AHA) has commissioned Hassall & Associates to develop a Bovine Johne’s Disease Risk Assessment Protocol for Beef Cattle Herds.

Background

Bovine Johne’s Disease (BJD) is a chronic wasting disease, caused by the bacterium *Mycobacterium paratuberculosis*, which causes a thickening of the intestinal wall and inhibits an animal’s ability to absorb nutrients. BJD has the potential to result in production and market losses, as well as impact on international trade as the issues of food safety attain more prominence.

There are 1,350 beef and dairy cattle herds in southern Australia known to be infected with BJD. The incidence and impact of BJD in Australia is concentrated in the dairy industry, particularly in Victoria. Of the 1,350 known herds, 142 are beef cattle herds, with about 115 of these herds being commercial and 27 being stud enterprises. Hassall & Associates (2003) has estimated the total number of BJD infected beef herds as being between 190 and 280 herds, with a mid-point estimate of 235 herds.

The prevalence of BJD has been greater in dairy herds than in beef herds. The reason for this is thought to be the intensive management systems and calf rearing methods in the dairy industry that are not used in the beef industry. Most of the transmission appears to occur vertically, from dam to calf. Climate may also play a role in the differing prevalence and distribution of BJD in the dairy and beef industries. The technical understanding of risk characteristics in beef herds is not yet highly developed, largely due to the low numbers of infected herds and low prevalence within herds.

BJD has the potential to impact on the marketing of Australian beef cattle by diminishing the status and standing of Australian produce overseas (including the live cattle export market). In effect this puts Australia’s single largest agricultural industry, an industry worth $6.4 billion for the year ended 30 June 2001, at risk. At the individual enterprise level, the management of the disease affects profitability by imposing movement restrictions on beef cattle and undermining the market value of cattle that have a lower disease status. Movement restrictions include zoning and quarantine of herds known to be infected. The extent of these restrictions is dependant upon the location of the herd, the herd status and the level of testing that has been undertaken to evaluate the amount of infection (if any) within that herd, as well as the type of animals being moved. The restrictions disrupt traditional stock movements, limit trading opportunities and increase costs for cattle vendors.

The Cattle Council of Australia (CCA), the peak industry body representing the interests of beef cattle producers, supports the protection of non-infected regions and herds. However, they have also highlighted the need for change in response to the problematic nature of zoning especially with respect to trading.

CCA has raised the concept of *risk based trading* as a possible alternative to current measures used to control BJD in the Australian beef industry. It should be noted that zoning, which is based on dairy regions, is a narrow form of risk assessment that relies on geographic location and prevalence of infected herds (between, not within herds). A Market Assurance Program is another form of risk assessment that relies on testing. Risk based trading looks to more comprehensively address the issue of risk and allow increased trading options where the risk is designated to be low and where it is between herds with similar levels of risk.
Study task
The study has aimed to:

- Develop a practical yet technically robust BJD risk assessment system (risk protocol) for routine adoption by producers and their advisers throughout the Australian beef industry. It must be simple for beef cattle producers and people involved in beef cattle trading throughout the country to understand and use. It should complement, though not necessarily replicate, similar Johne’s disease risk assessment systems currently being investigated for the dairy and sheep industries so implementation and effectiveness is enhanced.

In addition, the study has:

- Reviewed the existing means of declaring BJD status.
- Consulted with a reference group nominated by Animal Health Australia.
- Reviewed current movement restrictions on beef cattle for BJD.
- Reviewed different BJD testing and assurance programs in the Australian beef industry and efficiencies and deficiencies of each.
- Reviewed on-farm management practices that may facilitate or inhibit the spread of the infection to beef herds and subsequently within herds.
- Reviewed existing means of vendor declaration operating within the beef industry.
- Considered the JD risk-assessment protocols currently being developed for the dairy and sheep industries.
- Field tested the options with a sample of potential users prior to final recommendations being developed.
- Recommended means of training potential users and implementing the system in the field.

Methods
The team that has developed the risk protocol includes:

- Dr. David McClintock and Cheryl Kalisch, Hassall & Associates P/L;
- Dr. Evan Sergeant, AusVet Animal Health Services P/L; and
- Mike Stephens and Dr. Rod Manning, Mike Stephens & Associates P/L.

The protocol was presented to a reference group in April 2003, comprising representatives from AHA and industry. The membership of the reference group is shown in Appendix 1.

The protocol was subsequently refined and then field tested in May 2003 with producers, agents and other stakeholders. It should be noted that the producers involved tend to have larger and more successful operations, which means that the sample was slightly skewed. This is justified due to the need to engage this sector and also develop a workable protocol in a short period of time. An overview of the field test and the type of questions asked are provided in Appendices 2 and 3.

In June and July 2003, a subsequent version of the protocol was presented to the reference group, as well as to a forum considering future directions for BJD policy, organised by Animal Health Australia. The BJD Technical Advisory Group commented on the protocol. Comments were incorporated into this final report.

Report Structure
Chapter 2 outlines risk considerations for BJD. Chapter 3 addresses specific study requirements. Chapter 4 outlines the actual protocol that has been developed (final version). Chapter 5 contains a summary of the lessons from field testing. Chapter 6 outlines issues for implementation of the risk protocol. Chapter 7 contains study recommendations.
2. Risk considerations

Risk assessment in relation to international trade is defined by the OIE\(^1\) as “The evaluation of the likelihood and the biological and economic consequences of entry, establishment, or spread of a pathogenic agent within the territory of an importing country”. In the context of risk assessment for BJD associated with trade in live cattle in Australia, risk can be regarded as the likelihood or probability of introducing BJD into a previously uninfected herd (or area), and the consequences of introducing BJD for the newly-infected herd (or area). Risk assessments may be either quantitative (measuring probabilities and consequences numerically) or qualitative (measuring risk on a subjective scale rather than numerically).

There is little reliable data on the herd-level prevalence and within-herd prevalence of BJD in the Australian beef industry, or reliable demographic and risk-factor data on which to base a quantitative risk assessment for BJD trade-risk. Therefore, a qualitative approach was used for this project. Because the project is directed at developing risk-assessment guidelines to support the domestic trade of live cattle in Australia, this assessment has focused primarily at the herd level - the risks and consequences associated with herds with particular characteristics and how these risks can be reduced when purchasing cattle - rather than at a regional or industry level.

Risk factors for BJD in beef cattle

A range of potential risk factors for BJD in a beef herd have been considered, including:

- Enterprise type — Stud, commercial breeder, terminal breeder or fattener;
- Purchasing history — volume, type, source;
- Contact with dairy or dairy-cross cattle;
- Proximity to infected herds — infected dairying areas, infected neighbouring herds;
- Geographic/climatic region — effect of climate on survival and spread; and
- Testing history, disease status and/or participation in assurance programs (CattleMAP, BC-TAS, CT); and
- Management factors — stocking rate, calving, grazing and biosecurity.

Some of these factors are not well understood or easily documented. Those factors worthy of further consideration are discussed in more detail below.

**Enterprise type:**

The herd-level prevalence (proportion of herds that are infected) and within-herd prevalence (proportion of animals in infected herds that are infected) of BJD in the Australian beef industry are generally assumed to be low, based on historical testing records, limited data from State registers of Johne’s disease infected herds and the results of the south east Australian beef survey. In particular, prevalence levels (both herd and animal) are thought to be much lower than is the case for dairy herds in the control and residual zones. This difference is probably due to the different management practices and stocking rates for the different enterprise types.

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\(^1\) Office International des Epizooties, also known as the World Organisation for Animal Health.
In addition, purchasing and fattening of steers or heifers is likely to be a lower risk than purchasing breeders, because these animals are generally only kept for a short period, and are slaughtered before they reach an age where further spread of infection is likely. Bulls may also be a lower risk than cows, because of their shorter productive life. If they do break down, they may expose many calves.

Herds that have used dairy cows as embryo recipients or foster mothers will be a higher risk.

**Purchasing history:**
Past purchasing habits may have a significant effect on herd-risk for BJD infection. Generally, this is linked to a history of contact with dairy cattle or dairy-crosses or contact with known infected herds. Contact may occur through agistment or purchase of animals, use of animals as embryo recipients, or use as house-cows. Risk from purchased or agisted cattle also increases with the number of high-risk contacts along with the level and frequency of the contacts that have occurred. Greater contact (or more animals) is a greater risk than limited contact or fewer animals and risk increases with the number of animals introduced.

**Zone/region of origin:**
0.01% of beef herds in the Protected Zones are known to be infected, compared to about 0.26% for the Control and Residual Zones. Despite this, beef-only herds from the Control and Residual Zones are still likely to be a considerably lower risk than herds with a history of exposure to dairy or dairy-cross cattle. 1.1% of dairies are known to be infected in the Protected Zone, and about 14% in the Control and Residual Zones.

In addition, geographic risk of BJD is likely to vary with other factors, such as rainfall and topography, although these factors are still not well understood. Cattle from low-rainfall or extensive pastoral areas are likely to be a lower risk than those from high-rainfall areas with more intensive enterprises and higher stocking rates.

**Status and testing history of herd of origin:**
Current herd assessment for BJD in Australia is based on herd-testing using serology and allocation of a herd-status indicating the risk-level for the herd. High-risk categories (infected, suspect, restricted) are allocated under State-based regulatory program, while lower-risk categories (Monitored Negative, BC-TAS and Check Tested) are allocated under assurance programs.

Generally, herds with a negative test (CattleMAP, BC-TAS, Check Test) are lower risk than comparable herds (beef-only and non-assessed herds that cannot certify beef-only) without testing. Herds with a history of multiple negative tests over several years are a lower risk than herds with a single recent negative test.

**On-farm management**
On-farm management practices and other farm-level factors may have a substantial impact on the likelihood that a herd is infected, and the spread of infection within infected herds. However, these factors are still only poorly understood.

The most important factor affecting the likelihood that a herd is infected (or has been exposed to infection) is the past history of exposure to potentially infected animals either through agistment or purchasing, as discussed above.
Other factors that may be important but have not been adequately researched include proximity to infected herds and other biosecurity issues such as integrity of property boundaries and common use of roads or facilities with other herds.

The prevalence of infection within infected herds is affected by factors such as stocking rate, cow-calf management, testing history and action taken to reduce disease occurrence. Generally, infection rates are likely to be higher with higher stocking rates and more intensive grazing practices. Any practices which decrease exposure of calves to adult faeces will help reduce the level of infection, although options are limited in extensively managed beef herds. Regular herd-testing and culling of sero-positives (or culture positives) will help reduce exposure by the early removal of animals likely to be adding significantly to calf exposure. However, testing will not detect all shedders, and is relatively expensive compared to the benefit received, especially in low-prevalence herds. Early culling of clinical cases will reduce contamination levels, resulting in a reduction in exposure of susceptible animals. Similarly, early culling of their previous calves and siblings of clinical cases will reduce potential exposure, but at significant cost to the producer. Because of the generally extensive grazing management of beef cattle, measures to reduce calf exposure at and soon after calving, as recommended in the dairy industry, are not appropriate for the beef industry.

**Proposed new classification of a Beef-Only herd**

The analysis of BJD risk factors suggests that one of the major sources of risk is contact with dairy cattle. Should the cattle not have had contact with dairy cattle, then the risks of having BJD are much lower. Defining a Beef-Only herd, then, can help identify cattle that have a lower risk, which can then be used as part of a risk protocol.

The BC-TAS definition of a Beef-Only herd has a declaration of purchasing history and biosecurity measures. The Beef-Only herd is one that shall not contain:

- any cattle of a dairy breed;
- any cattle that are first generation dairy cross breeds; or
- any other cattle that have been born, reared, or been run on a property that was part of a milk producing dairy enterprise at that time, other than up to 5 "house cows" that are maintained for household milk supply, are grazed separately from, and have no contact with the herd.

For the purposes of the risk protocol, an operational definition of a Beef-Only herd is one that:

- Has had no contact with dairy cattle or dairy-cross cattle at any time during the previous five (5) years, unless those dairy cattle were from a herd enrolled in the Australian Johne's Disease Market Assurance Program for Cattle (Cattle MAP); and
- Has not grazed on land grazed by adult dairy cattle (2 years old or older) in the last 12 months.

In addition, other useful criteria to define a Beef-Only herd that can help limit the disease and facilitate trade are that:

- The herd does not include animals that have been part of a herd which is classified as Infected (IN), Suspect (SU) or Restricted (RD) according to the National Johne's Disease Standard Definitions and Rules (SDR) for Cattle (4th Edition December 2002) and,
• Cattle introduced into the herd or onto the property(s) have come from herds, which are of the same or higher status (BC-TAS, MN1, MN2, MN3) for BJD and came with a BJD vendor declaration, and
• Cattle are identified under the National Livestock Identification Scheme (NLIS).

It is proposed that all five criteria should be met. The definition of Beef-Only has been incorporated in the Risk Protocol in Chapter 4. The BJD Technical Advisory Group is currently collecting data from the States in order to better determine the risks posed by the Beef-Only category is indeed low risk and whether more formal quantification of these risks is warranted. The risk protocol may need to be amended depending on the results.

Consequences of BJD infection in beef cattle

For the domestic trade of live cattle, the herd of origin of the cattle is the source of risk, and the producer introducing stock is the person directly affected by the consequences of introducing infection. In addition there may be indirect consequences to other producers through the introduction of infection to a low-prevalence or free area, with consequent spread to other producers, loss of status of the area and possibly the imposition of movement restrictions for sale of cattle out of the area. Because of this, the consequences of infection (particularly in the individual herd) should determine the likelihood of infection that a producer is prepared to accept when purchasing cattle. However, many producers are either unaware of the potential consequences, or choose to ignore the risk, because BJD is rarely an important issue for commercial producers when purchasing cattle.

Prevalence and mortality rates due to BJD in infected beef herds in Australia generally appear to be low, so that the main cost associated with BJD in beef cattle is lost trade opportunities through quarantine or loss of market-access and the effect on land-value and the ability to sell land. Therefore, the expected consequences of infection are likely to vary considerably, depending on the individual enterprise type. Table 2.1 summarises the expected consequences for four broad enterprise types.

Table 2.1: expected consequences of BJD for enterprises

<table>
<thead>
<tr>
<th>Enterprise type</th>
<th>Consequences of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elite Seed stock &amp; Studs</td>
<td>Very High</td>
</tr>
<tr>
<td>Commercial beef breeder</td>
<td>High</td>
</tr>
<tr>
<td>Terminal breeder (slaughter only)</td>
<td>Moderate</td>
</tr>
<tr>
<td>Fattening</td>
<td>Low</td>
</tr>
</tbody>
</table>

Managing risk

Individual producers will have different probabilities of purchasing infected animals and also different consequences of infection. This study is providing a basis for producers to help manage their BJD risk through the use of the risk protocol (see Box 1 in Chapter 4).
3. Responses to specific study requirements

Current movement restrictions on beef cattle

Current movement restrictions for beef cattle in Australia are determined by the Standard Definitions and Rules for Johne's Disease in Cattle (SDRs), the CattleMAP guidelines and regulatory policy in the various jurisdictions. The SDRs provide for declaration of Residual, Control, Protected and Free zones and also require restrictions on movements from zones of lower to higher status. The SDRs also require surveillance in all except Residual Zones, and official movement controls (quarantine) on detected infected herds in all except Residual Zones. Current zones are as shown in Figure 3.1.

![Figure 3.1: Current BJD Zones](image)

Generally, zones in southern and eastern Australia were declared on the basis of the BJD situation in the dairy industry, mainly because BJD is more common in the dairy industry, and hence high-risk dairying areas were felt to pose the greatest risk for spread of infection. Because of this, movement restrictions for movements between zones have imposed significant hardship on some sectors of the beef industry and disrupted traditional trading patterns across these zone boundaries.

Current movement restrictions between zones are based on assessed status in the CattleMAP or testing history, as described in Table 3.2, with eligible movements accompanied by either a compulsory or voluntary vendor declaration.
Table 3.2  Current movement restrictions

<table>
<thead>
<tr>
<th>STATUS - ZONE OF ORIGIN</th>
<th>STATUS - ZONE OF DESTINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual</td>
<td>Residual ≥CT ≥MN1 or test to MAP standard Free ≥MN1 or test to MAP standard</td>
</tr>
<tr>
<td>Control</td>
<td>Control – ≥CT ≥MN1 or test to MAP standard</td>
</tr>
<tr>
<td>Protected</td>
<td>Protected – Approved movement test</td>
</tr>
<tr>
<td>Free</td>
<td>Free – – – –</td>
</tr>
</tbody>
</table>

These movement restrictions have been based mainly on the distribution of BJD in dairy cattle. They are not necessarily appropriate to the beef industry, where the BJD-risk for herds in the control zone is likely to be substantially lower than for dairy herds. Therefore, one outcome of this study could be to reconsider these movement requirements at a national level, and develop conditions more appropriate to the beef industry, and that take into account traditional trading patterns.

BJD testing and assurance programs in the Australian beef industry

There are three main testing and assurance programs currently operating in the Australian beef industry. These are the market assurance program (CattleMAP), the beef cattle trade assurance scheme (BC-TAS) and Check Testing (CT). These programs are important tools in risk management for BJD, and for the identification of low-risk stock, particularly for elite stud and commercial herds, where the introduction of BJD could have a catastrophic effect on the enterprise. Therefore, it is important that any risk-assessment process for BJD in the beef industry incorporate and build on these tools, rather than undermining them. At the same time, it must be recognized that any program designed to improve trading opportunities that does not rely on some form of testing has the potential to reduce the need for test-based programs, and therefore could reduce participation in the CattleMAP, BC-TAS and Check Testing programs.

CattleMAP

The CattleMAP is the most comprehensive program and provides the highest level of assurance. Producers are required to implement management practices to reduce the risk of introduction or spread of BJD in the herd and to undergo specified testing of their herd every two years. Participating herds are also subject to regular audits to ensure compliance with the program. A herds CattleMAP status progresses after each round of testing, starting at MN1 and moving to MN2 and MN3 after successive tests.

Although the CattleMAP was originally planned to provide 95% confidence of detecting a prevalence of 2% at any test round, recent research has resulted in a reduction in the estimated sensitivity of the ELISA to less than 20%, and a corresponding reduction in the level of confidence of detecting a 2% prevalence to about 50%. However, the test is still capable of reliably detecting well-established infection, so that any MAP herds that are infected are likely to be recently infected or at low prevalence, and therefore represent a lower risk than untested herds. Additionally, the confidence achieved from testing is cumulative, so that the higher the MAP status (MN2, MN3) the lower the likelihood of infection and hence the risk posed by the herd.
The Beef Cattle - Trade Assurance Scheme (BC-TAS), is a recently introduced, low-cost trade assurance scheme to facilitate movement of beef cattle from herds at low risk for BJD. It satisfies the requirements in relation to movements of beef cattle between Residual (RZ), Control (CZ) and Protected Zones (PZ) in South Australia, New South Wales, Victoria and Tasmania. The main requirements for BC-TAS are that the herd has had no contact with adult dairy cattle or dairy-cross cattle within the last five years, and that a Check Test (50 head) has been undertaken in the herd. Repeated Check Tests every two years are required to maintain BC-TAS status.

This scheme provides a lower level of assurance than the CattleMAP, but also provides a lower cost entry-point for producers who are unwilling to proceed straight to full CattleMAP participation. At present NLIS registration is recommended for BC-TAS producers, but the use of NLIS identification may become a requirement for participation in the future, to facilitate compliance audits. There are currently ?? producers registered for the BC-TAS scheme.

Check Testing
A Check Test (CT) is a low-level assurance test of adult animals in the herd biased to increase the probability of detecting infection. The sample for a Check Test is selected from animals over 2 years of age. In small herds all animals over 2yo are tested. Where there are more than 50 animals in this group, only 50 are tested. They are selected so as to include animals most likely to be infected and most likely to react to the test, such as animals in poor condition, older animals, and introduced animals.

A Check Test is not a status in the CattleMAP but is used to support vendor declaration for non-assessed herds. It is considered one status lower than MN1 for the purpose of introducing animals into a MAP assessed herd. The Check Test is valid for 12 months and may only be undertaken in herds in which there is no suspicion of infection and be used only to support vendor declaration of animals bred in that herd ("home-bred") and to animals introduced with a Vendor Declaration as originating from a Check Tested herd or a herd of higher status.

Check Testing provides the lowest level of assurance, because of the lack of any consideration of biosecurity or purchasing history of the herd. However, like the BC-TAS, it provides a low-cost entry-point for producers wishing to “test the water” without the cost and other requirements of the MAP.

Use of vendor declarations in the beef industry
The main vendor declaration currently used in the beef industry is the national vendor declaration (NVD) on the history of cattle management and chemical treatments or exposure. This is an important declaration directed at ensuring that meat is free of chemical residues and for maintaining access to important export markets. There are different NVD’s depending on whether the meat is destined for the European market or not. Johne’s disease is not part of the NVD and many feel that it should remain separate.

In regard to Johne’s disease, there is currently a recommended vendor declaration form, which is used principally for movements of cattle between zones and provides for certification of the origin of the cattle and their official status (regulatory or market assured) and their testing history.
4. **Recommended protocol**

**Objectives**

The aims of the risk protocol are to:

- Facilitate trade and limit disease spread by:
  - Providing protection from disease and, as far as possible, opportunities for infected herd owners to trade;
  - Providing awareness of levels of risk (avoid misinformation); and
  - Enhancing testing and management of the disease.
- Capture potential market benefits and position the Australian Beef Industry to respond to increasing international requirements of food safety.

The protocol may:

- Assist the farmer to recognize that the bio-security of their operation is their responsibility (and accept some degree of risk if they have an unfavorable outcome such as a positive reactor and understand the implication of infection);
- Provide a suitable form of farm risk assessment to dovetail with current Quality assurance programs; and
- Assist further reductions in the risk of BJD and further consolidate the industry’s trading position.

The protocol is for use by beef cattle producers that are introducing stock. At present, it applies to all stock purchases – there may be the ability to modify it to only concern purchase of breeding stock, or to modify it to also cover agistment. We have used the terminology of *Animal Health Statement* rather than *Vendor Declaration*, to avoid possible confusion with the current National Vendor Declaration (NVD).

**Overview of protocol**

There are two parts to the framework.

**PART 1:** Determine YOUR situation and needs for stock introductions
- Ask relevant questions.

**PART 2:** Determine the risks associated with THE SELLER’S herd
- Complete Animal Health Statement;
- Determine the level of risk;
- Compare buyer and seller risk scores; and
- Introduce cattle, complete further investigation or source alternate stock.

These parts are outlined. It is intended that the layout of the protocol would match the current National Vendor Declaration, with an explanation of the protocol (Parts 1 and 2) at the start, and then the Animal Health Statement as a series of forms that can be detached and/or completed by the vendor.
Part 1: Determining your situation and needs for stock introductions

The producer that is introducing stock needs to ask some questions about his/her own beef herd. These are listed below.

Herd status and history
- Do you have a Beef-Only herd status to protect?
  
  Beef-Only are cattle from a beef herd which has had no contact with dairy or dairy-cross cattle at any time during the previous five (5) years, and which have not grazed on land grazed by adult dairy cattle (2 years old or older) in the last 12 months. See the Animal Health Statement in Part 2 for a full definition.
  
  - Beef-Only herds are less likely to be infected than herds that have had contact with dairy cattle
  - Selling store or breeding cattle implies that you should introduce Beef-Only cattle.
  - Beef-Only producers should only buy cattle from other Beef-Only herds in order to protect the status.

- Are you part of a Market Assurance Program? What is your MAP status?
  
  - MAP (also BC-TAS) herds must introduce from the same status or better as required by guidelines
  - The higher the status, the lower the risk is that your herd is infected and the more important it is to protect your status.

Protection of your operation
- What are the consequences of infection for your operation?
  
  - Elite Seed-stock & Studs – Very High
  - Self-replacement herd selling to other producers - High
  - Self-replacement herds selling to slaughter - Moderate
  - Trading Operations - Lower
  - Operations with Vealers - Lower

  See Box 1 that shows ways of managing risk for different operations.

- What are the consequences of infection for your land?
  
  - An infected status may affect its value and salability.

- Is your herd situated in a low prevalence region?
  
  - Consequences may be more serious if the prevalence is low.

Type of cattle that you are planning to buy
- What type of cattle are you going to buy?
  
  - Beef is lower risk than dairy or dairy cross cattle
  - Desexed cattle and steers/heifers to fatten and sell are lower risk than breeders that stay in the herd and produce calves
  - Bulls may be lower risk than cows because of shorter life and lower numbers, but there are high impacts if infected as they may infect calves that are running with cows being joined.

- How many are you planning to buy?
  
  - The more you buy, the higher the risk.
Box 1: Ways to reduce your risk depending on the type of enterprise

1. Stud/Elite beef breeder
   - Assess your own risk of infection – purchasing history, testing history
   - Must comply with scheme requirements if in BC-TAS or CattleMAP
   - Limit number of cattle introduced
   - Use artificial breeding to introduce new genetics in preference to introductions
   - Target Free zone or MN3/MN2 from a lower risk area for introductions
   - Do not introduce dairy or dairy-cross cattle
   - Segregate stud from commercial breeders and fattening cattle

2. Self-replacement herd selling to other producers (commercial beef breeder)
   - Assess your own risk of infection – purchasing history, testing history
   - Must comply with scheme requirements if in BC-TAS or CattleMAP
   - Limit number of cattle introduced
   - Target BC-TAS or MN1 – MN3 from a lower risk area for introductions
   - Do not introduce dairy or dairy-cross cattle or cattle exposed to dairy or dairy-cross animals
   - Segregate cattle introduced for fattening and sell before 2 years of age

3. Self-replacement herds selling to slaughter (terminal breeder, slaughter only)
   - Assess your own risk of infection – purchasing history, testing history
   - Must comply with scheme requirements if in BC-TAS or CattleMAP
   - Target lower risk cattle for introductions (CT, beef-only, BC-TAS, MN1 – MN3)

4. Trading Operations (fattening)
   - Target lower risk cattle for introductions (CT, beef-only, BC-TAS, MN1 – MN3)

5. Operations with vealers (fattening)
   - Target lower risk cattle for introductions (CT, beef-only, BC-TAS, MN1 – MN3)
Part 2: Determining risks associated with a seller’s herd

A. Ask the Seller to complete the Animal Health Statement to allow you to answer:

- Are the cattle from Beef-Only herds?
  - Beef-Only herds are lower risk than herds that cannot comply with Beef-Only certification
  - Contact with dairy or dairy cross cattle increases risk of infection
  - Dairying areas are a higher risk than pure beef areas

- Have the cattle come from herds that are in a BJD program such as the CattleMAP or BC-TAS?
  - Herds with a negative test (CattleMAP, BC-TAS, Check Test) are lower risk than comparable herds without testing (applies for Beef-Only, non Beef-Only and dairy herds)
  - Herds with a history of multiple negative tests and managing movements over several years are a lower risk than herds with a single recent negative test (e.g. MN3<MN2<MN1<BC-Tas<CT)

- Are the cattle from Infected or Suspect herds?
  - Contact with known infected herds increases risk

The Animal Health Statement is attached.

B. Determine the level of risk.

1. Determine whether the cattle are from Beef-Only Herds.
   - If the cattle are from Beef-Only herds then you have more confidence.

2. Determine the risk scores for both the buyer’s and seller’s herds.
   - Use Table B2 to assign a risk score for both the buyer’s and seller’s herds. Scores vary from 0 (highest risk, for infected (IN) herds) to 7 lowest risk (Free Zone and MN3). Note that risk score 4 is only applicable for Beef-Only herds. The full risk score that is assigned should be labelled Beef-Only X or Not Beef-Only X, depending on the answer to part B1, where X represents the score from 1 to 8.
### Table B2  
#### Risk scores

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Infected and suspect herds, as well as unknown or otherwise not assessed cattle (IN, SU)</td>
</tr>
<tr>
<td>1</td>
<td>Higher risk restricted herds (TLP, RD1)</td>
</tr>
<tr>
<td>2</td>
<td>Moderate risk restricted herds (RD2)</td>
</tr>
<tr>
<td>3</td>
<td>Check Tested herds (CT)</td>
</tr>
<tr>
<td>4</td>
<td>BC-TAS herds (Applies for Beef-Only herds)</td>
</tr>
<tr>
<td>5</td>
<td>Tested to a MAP standard (Sample tested but not in MAP) (TMS)</td>
</tr>
<tr>
<td>6</td>
<td>Moderate market assurance (MN1)</td>
</tr>
<tr>
<td>7</td>
<td>Higher market assurance (MN2)</td>
</tr>
<tr>
<td>8</td>
<td>Free Zone of highest level of market assurance (FZ, MN3)</td>
</tr>
</tbody>
</table>

**Glossary:**  
- **IN:** Infected  
- **SU:** Suspect  
- **TLP:** Tested Low Prevalence  
- **RD:** Restricted (Infected, but with one or more negative tests)  
- **CT:** Check test  
- **MAP:** Market Assurance Program  
- **TMS:** Tested to a MAP standard  
- **MN:** Monitored Negative (three grades, 1-3 with 3 being highest)

C. Compare buyer and seller risk scores, where the risk scores are derived from the previous table for both *Beef-Only* and Non *Beef-Only* herds. If you are a seller, then you can identify those producers that you can sell to with safety. Producers in CattleMAP or BC-TAS must also comply with program requirements to maintain their status.

The framework makes use of some key signals:  
- Green – proceed after considering your needs.  
- Orange (or Amber) – have more caution – more analysis is needed.  
- Red – stop.
Where both the buyer and seller are *Beef-Only*, the matrix is:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buyer</strong></td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>1</td>
<td>Orange</td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
<td>Orange</td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>3</td>
<td>Red</td>
<td>Red</td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>4</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>5</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Orange</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Introductions must be consistent with rules for MAP and entry to Free Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The matrix also works where both the buyer and seller are not *Beef-Only*.

There is no formal procedure offered to determine the respective risk score that would be needed for a buyer who has a *Beef-Only* herd that is considering purchasing cattle that are from not *Beef-Only* herds. More caution is needed in this case and the introductions of stock should be from as high a score (lower risk) as possible. *Beef-Only* herds that wish to remain beef only must introduce from other *Beef-Only* herds or from herds that are Tested to a MAP standard or better (risk score 5). Where the buyer is not *Beef-Only* and the seller is *Beef-Only* (as per the Animal Health Statement), then a lower score might be considered.

A general guide to introductions of cattle, with examples of some constraints and concessions, is:

**Green** – introductions from a green herd can be considered to be low risk
[NB: Low risk does not mean BJD Free or Zero Risk]
- MAP, BC-TAS and CT herds must comply with the requirements for their respective schemes. Herds in the Free Zone can only introduce from MN3 herds.
- Currently herds in the WA Free Zone can introduce beef cattle from Residual and Control Zones if they are from MN2 or MN3 herds. Movements from NT and Queensland and SA Protected Zones need a declaration of origin and from the NSW Protected Zone, a current Check Test.
- For all status types, *Beef-Only* is considered a lower risk than non *Beef-Only* or dairy.

**Orange** – introduce with caution, subject to further risk assessment.
- MN1 herds may introduce small numbers from CT herds, as specified in MAP guidelines. BC-TAS herds currently cannot do this.
- Suitable for producers not selling replacement cattle ( vealer producers, feedlots, etc) where all cattle are (sooner or later) sent for slaughter and consequences of infection are lower.

**Red** – not recommended as a source of breeding cattle.
- *Beef-Only* or better herds cannot introduce animals from Red herds without losing status.
- Infected or suspect herds may also be subject to movement restrictions.

D. Introduce cattle or conduct further investigations

Further investigations may require advice from your veterinarian. Sourcing alternative stock may be necessary. While alternative stock may be more expensive, consideration of the consequences of introducing infected cattle to your herd may put the cost in perspective. Refer to the general purchasing guide above.
Animal Health Statement for Johne’s disease status of beef cattle

**PART A**

I ______________________ of ___________________________ am the person with day to day responsibility for the husbandry of, the cattle described below.

The cattle have been kept at ____________________________ (Name and location of property)

This property is in a (tick applicable box):
- Residual
- Control
- Protected
- Free
- Zone for BJD

Property Identification Code (PIC) or tail tag

<table>
<thead>
<tr>
<th>Number</th>
<th>Brads, ear tags, earmarks, tattoos</th>
<th>Description age, sex, breed</th>
</tr>
</thead>
</table>

attach signed list if needed

The cattle described above, either (tick applicable boxes) were:
- A.1 bred, raised and have only resided on the property detailed above; or
- A.2 purchased/introduced and have resided on the property above for at least four years; or
- A.3 purchased/introduced with an Animal Health Statement equivalent to:
  - Part B
  - Part C
  - Part D
  - Part E
  - Part F
  - Part G

Note: Making a false or misleading statement about the disease status of cattle for sale may make the signatory liable to prosecution and/or civil action under the Trade Practices Act 1974 and relevant State legislation. **ALL PARTS ARE COMPULSORY**

**Part B: Beef-only herds**

If applicable, answer the following questions. The cattle owned or managed by me,

1. Do not include animals that have been part of a herd which is classified as Infected (IN), Suspect (SU) or Restricted (RD) according to the National Johne's Disease Standard Definitions and Rules (SDR) for Cattle (3rd Edition July 2001) and,
2. Are from a beef herd which has had no contact with dairy cattle or dairy-cross cattle at any time during the previous five (5) years, unless those dairy cattle were from a herd enrolled in the Australian Johne's Disease Market Assurance Program for Cattle (Cattle MAP) and,
3. Have not grazed on land grazed by adult dairy cattle (2 years old or older) in the last 12 months and,
4. That are for sale, if introduced into the herd or onto the property(s) have come from herds, which are of the same or higher status (BC-TAS, MN1, MN2, MN3) for Bovine Johne's Disease (BJD) and came with a BJD vendor declaration, and
5. Are identified under the National Livestock Identification Scheme (NLIS).

**Part C: CattleMAP herds only**

If applicable answer following question. The cattle herd has the following status in the CattleMAP:

<table>
<thead>
<tr>
<th>MN1</th>
<th>MN2</th>
<th>MN3</th>
<th>(insert year status obtained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate No.</td>
<td>Expiry date:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part D: BC-TAS herds**

If applicable answer following question. The cattle herd is registered under the Beef cattle – trade assurance scheme and still complies with the requirements of that scheme:

<table>
<thead>
<tr>
<th>Certificate No.</th>
<th>Expiry date:</th>
<th>Year joined:</th>
</tr>
</thead>
</table>

**Part E: Check-test or tested to MAP standard herds**

If applicable answer following questions.

1. I have no reason to suspect that Johne’s disease is present in the herd of origin or on
   - any land on which the herd has grazed. The property is not in quarantine or under movement restrictions on account of Johne’s disease; and
2. Herds tested to CattleMAP Standard (TMS): within the last 12 months, a herd test equivalent to a Sample Test under CattleMAP has been conducted by
   - a veterinarian approved by the State for Johne’s disease programs, with negative results for John’s disease OR
3. Date of test:…/…/… Previous negative tests (years): 19… 20…Within the last 12 months, at least 50 cattle in the herd of origin being from the older age groups bred in the herd and/ or introduced in the past 4 years, have been tested by a veterinarian approved by the State for JD Programs with negative results for Johne’s disease. Date of test:…/…/… Previous negative tests (years): 19… 20…

**Part F: Restricted herds or Tested Low Prevalence**

If applicable answer following question.

The cattle herd is infected but has an official Johne’s disease status of: (enter date(s) of latest test)

<table>
<thead>
<tr>
<th>Restricted1</th>
<th>Restricted2</th>
<th>Tested Low Prevalence</th>
</tr>
</thead>
</table>

**Part G: Other status herds (Infected, suspect)**

If applicable answer following question.

The cattle herd has the following status for Johne’s disease:

<table>
<thead>
<tr>
<th>Infected</th>
<th>Suspect</th>
<th>Non-beef only/unknown</th>
</tr>
</thead>
</table>

**Part H: DECLARATION**

Declared at: _____________ Date: _____________ Signed _____________

(Note: Stock agents cannot make this declaration on behalf of clients)
5. Field test findings

All contributors indicated the current system of BJD regulation results in significant trading restrictions to their operations. This included restrictions of trade to Queensland, NSW Tablelands, between NSW and Victoria, and to western areas of Victoria.

Most had heard of the concept of risk based trading and all agreed that the principle, trading on the basis of assessment of individual buyer and seller risk, would free up trade to some degree and be far better than the current regulation. Primarily this was the view because the system allows herd owners to have greater control over their trading situation. It was evident that risk based approaches are not clearly understood, especially with the type of information that would be needed to make such an approach work. Producers were not confident that they knew the “right” questions to be asking.

The draft mock-ups elicited positive responses from most contributors. Contributors to the draft mock-up believed the system would open up the market, particularly for females (heifers, cull cows and cows with calves at foot).

Who would bear the cost?
Costs to herd owners, buyers and stock agents to implement the system were not found to be high. Costs were primarily in terms of time and testing. A number identified that rebates for testing would reduce the cost required to move between the ‘traffic lights’. Stock & station agents indicated that for the most part additional effort on their behalf, particularly the extra paperwork, would not be a concern if it translated to higher returns to their vendors.

Implementation in conjunction with the National Vendor Declaration
Implementation in conjunction with the National Vendor Declaration (NVD) system or in a way similar to the NVD system was viewed as a least cost and practical way to implement the system. This provides for a paper trail to be kept on hand and producers, agents etc are familiar with the type of system. Some producers suggested a simple ‘yes/no’ or ‘green/orange/red’ question on an NVD would be the easiest, however overall contributors accepted that more detail would be required. However the real issue would be encouraging people to ask for the Animal Health Statement in the first instance. A number of people consulted identified the potential for inclusion of “BJD” on the NVD’s to create market access concerns.

Audits
Confidence in cattle purchased through such as system was estimated to be high on the proviso that some back up evidence is available (paper trail) and that there is a regulation to provide a basis for challenging declarations made under the system. On more than one occasion concern in relation to the Privacy Act was identified as a potential limitation to checking up on the basis of declarations. Some contributors thought that if critical mass be obtained then additional regulation (i.e. mandatory use of Animal Health Statements) would not be necessary. However, some thought that regulation to underpin the integrity of the system essential - i.e. ‘regulation with teeth’ that allows prosecution for dishonest declarations.

How to bring people on board?
Primarily, contributors identified that a dollar benefit would attract people to be involved in the system. While an artificial assistance payment might work (as little as a few dollars a head), a market benefit is essential to give the system credibility.
The lack of premiums being presented in the market for MN cattle, as well as low uptake for schemes such as CattleCare, suggests that reliance on market benefits may be optimistic.

**Interim period with risk based trading**

There is no clear feeling for whether the incidence of BJD would increase or decrease under a risk based system. Some producers were of the opinion that it would already be established as much as it is going to be in the traditional trade areas and that additional infections found would result merely from additional testing. Other contributors thought it would spread but not to a point of needing to worry about it. Other contributors thought that the system would remove the incentives for herd owners to seek loopholes in the current system, with flow on benefits to limiting the spread of BJD.

Zones that restrict movements are viewed as contrary to the system of risk based trading and that zoning negates its potential benefit. An interim period with the two systems running concurrently would add to the real and perceived bureaucracy of BJD administration (i.e. would not work).

**Education**

It was obvious that education and promotion would be essential to ensure such a system was successful. Education would be needed to ensure producers know:

- To be able to assess their situation;
- To ask for an Animal Health Statement when purchasing cattle;
- How to use/fill out the forms;
- That they know that they should ask before buying;
- What questions to ask when they do;
- That it is possible to seek cattle in previously zoned areas;
- Options they have to progress through the system (red to orange to green);
- That the system recognises 'relative risks' not nil risk; and
- That they are reminded regularly of BJD and the risks.

**Case studies and further field testing**

Contributors mentioned the need to do detailed case studies. These would be useful for determining if there are loop holes and also for use in educational materials should they be required.

**Summary of issues raised**

A list of the issues raised, including how they have been addressed in modifications to the framework, is summarised in Table 5.1. This is not in any particular order.
Table 5.1 Issues raised and their incorporation into the risk protocol

<table>
<thead>
<tr>
<th>Issue</th>
<th>H&amp;A response and change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to check details of claims made. How do you avoid dishonesty or loopholes? What happens when the audit trail fails?</td>
<td>Seen as vital. Discussed in Chapter 6 (implementation)</td>
</tr>
<tr>
<td>The order of Part B and Part C should be changed.</td>
<td>Leave as is.</td>
</tr>
<tr>
<td>Need a Statement in Part A informing participants what sections they need to complete in the survey</td>
<td>All parts to be completed (some modifications made to ensure this).</td>
</tr>
<tr>
<td>Delete NLIS in Part B</td>
<td>Leave as is (discussed in Chapter 6)</td>
</tr>
<tr>
<td>Need a Statement in Part A informing participants what sections they need to complete in the survey</td>
<td>Yes.</td>
</tr>
<tr>
<td>Is the additional risk of dairy cattle covered?</td>
<td>This is an implementation issue (see Chapter 6). The restrictions to trade would implicitly continue under a risk approach. There are separate measures needed to assist infected producers and to provide a set of pathways out of infection. Any suggestions have been considered.</td>
</tr>
<tr>
<td>The order of Part B and Part C should be changed.</td>
<td>Leave as is (discussed in Chapter 6)</td>
</tr>
<tr>
<td>Is there going to be an interim period?</td>
<td>Yes.</td>
</tr>
<tr>
<td>What happens to those who have a positive test?</td>
<td>This is an implementation issue (see Chapter 6). The restrictions to trade would implicitly continue under a risk approach. There are separate measures needed to assist infected producers and to provide a set of pathways out of infection. Any suggestions have been considered.</td>
</tr>
<tr>
<td>Layout design may need some improvements and provide a better roadmap</td>
<td>Agreed. Queensland may need to be further engaged.</td>
</tr>
<tr>
<td>The process needs to be a national approach. What about Queensland? (one contributor felt that Queensland producers are not aware of BJD or are currently missing opportunities, so would not really be prepared to take on the risks)</td>
<td>Agreed.</td>
</tr>
<tr>
<td>Grey areas in the matrix need to be filled out. Grey areas include dairy cross, young stock on agistment and testing of young cattle. It especially applies to the “beef only” and the BC-TAS scheme parts.</td>
<td>Agreed.</td>
</tr>
<tr>
<td>Differentiation of cattle in the yards: colour code green, red or orange, or changing the selling sequence of cattle.</td>
<td>An implementation issue, but considered unlikely to work.</td>
</tr>
<tr>
<td>How many head of cattle need to be tested?</td>
<td>Existing CT, BC-Tas and CattleMAP schemes determine this. States may impose their own requirements. Positive test results (supported by culture or pathology) are reliable, but tests will miss some infected animals, particularly early cases. Biosecurity means the precautions undertaken to ensure animal health. Jargon has been minimised as far as possible, although it is not possible to avoid it completely.</td>
</tr>
<tr>
<td>Is science reliable in providing accurate results?</td>
<td>A communication issue (see Chapter 6).</td>
</tr>
<tr>
<td>Definition of ‘biosecurity’ and other jargon</td>
<td>Considered, but would make too many categories.</td>
</tr>
<tr>
<td>Issue</td>
<td>H&amp;A response and change</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Buying mixed lots</td>
<td>Would need a separate risk protocol for each lot. The risk protocol should look similar to the NVD and should, as far as possible, use a similar booklet format (Chapter 6).</td>
</tr>
<tr>
<td>Link with NVD</td>
<td></td>
</tr>
<tr>
<td>Beef-only may be a disincentive for people to test</td>
<td>Agree. Would need the incentive for testing (such as CCA Rebate) to remain. The proposed system is aimed at freeing up trade as far as possible.</td>
</tr>
<tr>
<td>What happens if there is no market significance to the scheme?</td>
<td>Considered in Chapter 6. This is a major issue.</td>
</tr>
<tr>
<td>Introduce more categories to distinguish between, e.g. MN1 beef and MN1 dairy.</td>
<td>Considered in Chapter 6. An alternative system based on a decision tree may avoid some of the problems of too many categories.</td>
</tr>
</tbody>
</table>
6. Implementation issues

The main sets of issues are:
- Producer engagement;
- Communication; and
- Other issues to be resolved.

Producer engagement

A risk-based approach is very dependent on producer engagement and adoption of the program. An understanding of the principles and application of risk assessment by producers is essential. Further, if producers are not prepared to insist on an animal health statement for introduced cattle and use it as a risk-management tool, a risk-based approach will have very little impact.

Producers appear to not understand BJD risks at present or how to implement risk-assessment and risk-management measures to reduce their risk, even when they are aware of BJD as an important disease. There are producers that are expected to have had very little experience of BJD zoning, especially in inland areas. Until the awareness and understanding is changed, producers are unlikely to be able to adequately implement any risk-based trading program effectively.

The risk protocol would need to be adopted by a large proportion of the industry in order to make it work. In addition, there is a need to build up a critical mass of cattle, in certain areas, that would be eligible for classification as ‘green’ and low risk herds.

There are additional costs to (vendor) producers, through testing costs, additional time and paperwork to maintain eligibility, or both. Some form of incentives for producers to participate may be necessary to increase uptake. However, testing incentives would need to be supported by financial assistance for affected producers. Testing incentives will be of little value if producers can trade on a beef-only status.

Further to the problem of engagement, should there not be any market significance, such as market premiums/benefits, then the scheme will not work. Demonstrating these benefits will be crucial to achieve producer engagement.

Education and communication

Because of the need to engage producers and explain risk-based approaches, it is not surprising that education and communication are vital issues. An effective education and communication program must be a critical component of any move to risk-based trading for BJD. A major change in producer attitudes will be required to achieve widespread support, understanding and adoption of the program by producers, particularly those introducing stock.

The communication will need to ensure producers:
- Are reminded regularly of BJD and the risks;
- Know how to assess their situation;
- Know to ask for an Animal Health Statement;
- Know that they should ask before buying;
- Are aware of the options they have to progress through the system (from red to orange to green);
- Are aware of areas that they can consider trading with again;
- Are aware that the system recognises ‘relative risks’ not nil risk; and
- Know how to use the protocol developed.
Case studies and the demonstration of the use of the system for different types of producers are likely to be useful to inform any resultant communication/education program.

There was a general feeling that when the drought ends, many beef producers will be looking for re-stockers, which will be in short supply. Under these circumstances, risk assessment for BJD is likely to be well down the list of priorities for producers when looking for suitable cattle. Changing this attitude would be very desirable, but also very difficult, and an important aspect of any communication/education program.

The communication/education program will need to consider and build on the measures currently included in the National BJD Program. It is anticipated that the communication should be largely industry driven and utilise existing networks.

Other issues to be resolved

Vendor declaration and auditability
Vendor declaration and auditability of those declarations are clearly going to play an important role in the success/failure of risk based trading and its credibility in the marketplace. Therefore special attention must be given to ensuring that the risk assessment is practical and easy to understand and adopt, so that errors in completing the risk assessment are minimised. Auditing is needed to give confidence to producers that the declarations are meaningful. Auditing of the program is likely to be extremely difficult unless significant effort is put into development and implementation of an auditable system of documentation, particularly for certification of cattle as being from a ‘beef-only’ herd. The need for auditing will require increased paperwork for producers not already participating in CattleMAP or Cattlecare, creating a deterrent to participation.

Voluntary vs compulsory declarations
Voluntary declarations are expected to be more meaningful because if a person requests a declaration they are more likely to make use of the information provided to assist decision-making. However, many producers are likely to ignore or not utilise voluntary declarations. Conversely, compulsory declarations require legislative changes to compel their use and enforcement measures to ensure that they are actually used, at significant cost to governments and industry. In addition, compulsory declarations are not likely to be as effective if people are only using them because they are required to, without utilising the information provided to assist in risk-management.

Regardless of whether the declaration is voluntary or compulsory, it is essential that any BJD declaration is supported under each jurisdiction’s relevant stock disease legislation, to provide better protection against false declarations. While civil action or action under fair trading legislation by individuals is possible, it is likely to be difficult and protracted. Conversely, potential for action under the stock diseases legislation sends a clear message to producers that State departments are strongly supporting the program, and also reduces the responsibility on individual producers in preparing and pursuing cases.

National Livestock Identification Scheme (NLIS)
Participation in NLIS was identified as an important issue to support auditability of the program, particularly for beef-only producers that are not part of the CattleMAP or BC-TAS programs (it is included currently in Part B of the Animal Health Statement). The NLIS will need time to be more widely understood by producers.
As a minor issue, the requirement for NLIS might be better located within Part A rather than Part B of the Animal Health Statement.

**Zoning and State requirements**
Risk-based trading has the potential to allow trading from Control to Protected Zones for eligible *Beef-Only* cattle without testing. Any such relaxation of zone movement conditions would require the support and agreement of affected State industry and government bodies. If not all States support such changes, there would be a reversion of zone boundaries back to State boundaries and imposition of State-based movement restrictions. Having all States on side is critical. The particular issue that was mentioned regarded Queensland’s requirements.

Those contributors in the field test view zones that restrict movements as being contrary to a risk based approach and their presence would negate potential benefits. An interim period with the two systems running concurrently would add to the real and perceived bureaucracy of BJD administration (i.e. would not work). This suggests that decisions on zoning would need to be made prior to the implementation of the scheme.

**Potential effect on CattleMAP, BC-TAS and testing**
Risk-based trading could easily have a detrimental effect on participation in the CattleMAP and BC-TAS programs, particularly if increased trading opportunities become available without participation in these programs being essential. For example, if producers can trade from control or residual zones to the protected zones on the basis of a beef-only declaration there will be less incentive for many producers in these areas to test, resulting possibly in the demise of BC-TAS and restriction of CattleMAP mainly to a smaller group of elite herds.

**Differentiation of dairy and beef MAP herds**
The proposed risk-assessment approach includes a differentiation of beef-only herds as being a lower risk than non beef-only herds of the same status, including for herds in the CattleMAP. This means (for example) that MN1 herds that are beef-only will be identified as a lower risk than MN1 Dairy or mixed herds, even though the CattleMAP guidelines recognise them as being of equal status.

In all cases, the preference is to separate out dairy and beef herds as they pose different levels of risk.

This approach could create problems for CattleMAP at a later date by the development of a perceived different level of assurance for herds of equal status. This will need to be considered by CattleMAP.

**Pathways out of infection**
The current risk protocol does not adequately address the issue of what trading options an infected producer has, nor how to change from having a high risk herd (apart from testing). The National BJD Program, as appropriate, should further address this issue.
7. **Recommendations**

The recommendations for this study are:

- Cattle Council of Australia and Animal Health Australia consider and consult widely regarding the risk protocol. The risk protocol, along with shifts to a risk based trading system, should be considered in conjunction with other initiatives such as financial assistance and testing rebates. Risk based trading is likely to complement these initiatives rather than provide an alternative, especially in the short run.

- The BJD Technical Advisory Group should complete its investigations about the level of risk posed by *Beef-Only* herds. The risk protocol may need to be modified as a result.

- Animal Health Australia and Cattle Council of Australia should consider the implementation issues raised, particularly demonstration of benefit, producer engagement and communication, zoning and impacts on CattleMAP. These issues will have a significant bearing on how the scheme can be developed and presented, as well as on its uptake and success.

- Animal Health Australia and Cattle Council of Australia should consider more substantive field testing and a trial implementation period before the wider roll-out of risk protocols.

- Animal Health Australia and Cattle Council of Australia should consider commissioning a study to analyse the communication needs to implement risk protocols and to identify appropriate case studies. Case studies and the demonstration of the use of the system for different types of producers are likely to be useful to inform any resultant communication campaign.
Appendix 1  Reference panel

- Ralph Hood, Dick Roe and Christina Langwill – Animal Health Australia.
- Michael Hartmann, Nick Keatinge, Alisa Fox, John Stewart, Jack Hawkins - Cattle Council of Australia and industry representatives.
- David Kennedy – AusVet Animal Health Services P/L.
- Hugh Miller – Department of Primary Industries – Victoria.

Appendix 2  Field testing contacts

National/State/Cross-regional

- National JD Coordinator
- NSW BJD Coordinator

Northern NSW/Qld

- 1 x trader/agent
- 3 x stock & station agent (one is also a herd owner, not counted below)
- 3 x Infected commercial producers (one large commercial, one medium commercial, one small stud)
- 3 x commercial producers (2 large, 1 medium)
- 2 x stud (one large - also representative of stud associations, one small MAP)

Northern Victoria

- 2 x stock & station agent (one cattle buyer)
- 3 x commercial producers (3 large)
- 1 x Pasture Protection Officer
- 1 x stud

Western Victoria

- 1 x stock & station agent
- 1 x stud
- 4 x commercial producers (including one trader)
Appendix 3  Questions for field testing

The fieldwork needs to be able to identify, on the basis of our individual consultations or workshop:

- Will Risk Based Trading, in principal, work?
- Will the proposed framework, including the risk grades, work – how should it be revised and why?
- What incentives and assistance will be required?
- Who are the potential winners and losers?
- What changes should be made?
- What are the characteristics of producers/enterprises/regions that might mean that Risk Based Trading and the proposed system might not work?
- Will the system free up trade, particularly in reference to cross border trade?
- Will the system limit or encourage the spread of BJD?

A  Preconceptions

1. What are your current constraints to trade and control of BJD?
2. Are you familiar with the concept of Risk Based Trading?  Yes / No / Maybe
3. If yes, what is your understanding of the concept?
4. If yes, do you believe that, in principle, it is a potential solution to trading restrictions associated with BJD zoning?  Why?

B  Reactions to System in Principle (questions following overview of system and run through mock-ups)

5. Do you expect that such a system would free up trade?  Disagree  1 2 3 4 5  Agree
   Comments (inc. whether it varies by enterprise type?)

6. What sort of markets would be opened up to you or herd owners in your area?
   What are the benefits associated with these market options?

7. What costs (and quantum) do you expect would be incurred as a result of the implementation of this system for:
   i. herd owners______________________________________
   ii. stock agents______________________________________
   iii. buyers___________________________________________

8. Can this system work together with other industry schemes, e.g. Vendor declarations currently required, Cattlecare etc?
   Yes or No.  Comments as to why or why not?

9. What incentives or assistance would be required to overcome the constraints previously discussed if
   a. The system were voluntary__________________________________
   b. The system was regulated___________________________________
10. What issues would arise for stock and station agents in the implementation of the system?
11. Is the present zoning an issue for how the scheme can be implemented?
12. What guarantees might be needed in order to use it (e.g. declarations, paper trails for auditing, guarantees that what the seller says is true and accurate)?
13. Are there any potential loopholes that you can see?
14. Would supporting regulation be necessary?
15. How confident would you be in the cattle that you purchased through such a system?
   Not very 1 2 3 4 5 Extremely
16. Would you expect the proposed system to limit the spread of BJD?

**Recommended changes**

17. Suggested changes to the framework?
   a. Initial questions
   b. Suggested changes in the ranking or order of ‘grades’
      i. Do the differences allow easy or worthwhile levels of progression (is effort consistent with benefit?)
   c. What changes would make the system more easily understood? What type of format/presentation would be most useful?
18. What type of education / assistance would be necessary? Are there other measures that would contribute to the overall success of implementation?
Appendix 4  Alternative risk protocols considered

A number of alternative approaches were reviewed and considered in the development of the risk protocol presented here. These alternative approaches are outlined below.

The Australian dairy industry
For the dairy industry, a model has been proposed (and is still under development) that considers status, biosecurity, and prevention. A score is assigned to each class (e.g. Infected have a high score), and then added together with the score associated with biosecurity and prevention measures. There appears no basis for adding together the scores in this way, especially without any weighting according to either likelihood and/or consequence. In addition, the biosecurity and prevention are not appropriate for beef in the same way as dairy – especially since one of the main prevention means (calf snatching) is not appropriate for extensive beef operations. Therefore, the Australian dairy model was not considered further.

The Wisconsin model
The Wisconsin Johne’s disease market management program is a voluntary program of testing and classification of herds according to level of Johne’s disease infection. It was developed for use in a high-prevalence dairying area in Wisconsin USA. The program is designed to provide incentives for farmers to test and implement control measures for the disease by providing differential risk classification for herds with different reactor rates. The main features of the program are:

- All testing is voluntary – no producer will be required to test his/her cattle
- Farmers who do test will add value to their cattle
- Informed buyers will pay more for cattle from lower prevalence herds
- A graded scale based on serological results describes herd status
- Untested herds are classified as maximum risk for BJD
- Herds must test every 12-14 months to remain in the program
- Infected animals can be sold, but must be identified by ear mark and with a written notice of status
- The level of assurance provided by Level A (lowest-risk category) in the program is considerably less than that provided by an MN1 status or even a check test (0/30 animals positive at initial test, compared to 0/50 for a check test)
- Other categories assume some level of infection in the herd, depending on sero-prevalence.

In summary, because of its emphasis on high-prevalence dairy herds, the Wisconsin model was not thought to be appropriate for a beef risk protocol in Australia.

Risk-based trading for Johne’s disease in sheep in Australia
A study was recently undertaken to explore the feasibility of a sheep-trading system based on quantitative assessment of the risk of OJD transmission. Such a system would allow more flexibility in the management of OJD-risk, and could be less restrictive on flocks that are taking positive steps to control or prevent the disease. It would also allow individual flocks to better manage their OJD-risk when trading within or between zones.

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Before this approach is taken further, there needs to be detailed consideration and consultation at a national level and agreement to an appropriate means of implementation, as well as appropriate risk-categories and relative risks for risk-factors and appropriate surveillance and control strategies for each zone or region.

A novel approach was used to develop a classification system for sheep flocks based on the OJD-risk that they pose. Using this approach, flocks were classified on the basis of location (State and zone) and infection status, including market assured flocks and infected flocks with varying levels of prevalence and negative testing. A quantitative risk-model was developed to estimate the mean and upper 95% limit of risk for flocks in each category (risk-index). The risk-index for a flock-category was calculated as the product of the probability that the flock is infected and the likely within-flock prevalence of infection if it is infected, and represents the likelihood that a single randomly selected sheep from flocks in the category would be infected. This risk-index was then converted to an integer risk-score between 0 (lowest risk) and 13 (highest risk), with each point difference in score representing a doubling (or halving) of the risk compared to the adjacent category.

Although this risk-score provides a simple and objective assessment of flock-risk for OJD, there was considerable uncertainty associated with the final values, such that the upper 95% limit for each category was generally 1 – 2 points higher than the mean. Therefore, it may be appropriate to manually adjust some categories to ensure that like categories are grouped together. Similarly it would be appropriate to set a maximum value for the risk-score (for example 10 or 12), and adjust the individual values as necessary to fit within this limit.

To increase the flexibility and usefulness of this approach, a simple method for adjusting risk-scores was also developed, based on the expected change in risk associated with specific flock-characteristics or practices, such as vaccination, biosecurity measures, negative surveillance results, etc. Using this approach, a doubling (halving of risk) results in a one point addition (deduction) to the score, with points being additive. For example, if ongoing vaccination of lambs over a 3-6 year period is assumed to halve the prevalence in a flock, there is a corresponding halving in the flock-risk, and therefore a one-point deduction from the risk-score.

The sheep model provided some useful ideas for inclusion in the beef cattle model, but the differences between the industries and the lack of comparable data on prevalence and epidemiology in cattle precluded any adaptation of the sheep model for use in cattle.

Other approaches
In beef cattle, two alternative systems have been proposed previously, based on assessment of herd status and biosecurity measures. These approaches have been considered in the development of the proposed system. In addition, a number of similar approaches to assessing and combining risk were considered and refined during the development of the final proposed risk protocol.