

**Independent Review Panel Report
on the
Import Health Standard
for the
Importation into New Zealand of
Specified Bee Products from Australia**

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Background

The Panel was appointed to consider the scientific evidence as it relates to certain issues that are disputed by the Ministry of Agriculture and Forestry (MAF) and the National Beekeepers' Association (NBA) of New Zealand. As detailed in the Terms of Reference provided to the Panel (see Appendix B), the specific areas of science that are in dispute relate to –

- a. The effects of *P. alvei* on non-bee species
- b. The effects of *P. alvei* on honey bees
- c. The effects of *P. alvei* on the objectives of the National American Foulbrood Pest Management Strategy
- d. The effectiveness of heat treatment in reducing the level of European Foulbrood in honey
- e. The likelihood of European Foulbrood being introduced in untreated honey from Western Australia
- f. The effectiveness of heat treatment in reducing the level of *N. ceranae* in honey
- g. The likelihood of *N. ceranae* being introduced in untreated honey from Western Australia
- h. The likelihood of Israeli Acute Paralysis Virus becoming established in New Zealand as the result of importing bee products from Australia
- i. The effects of Israeli Acute Paralysis Virus on New Zealand honey bees should it become established in New Zealand.

The Panel has been asked to consider with respect to each of these areas:

- a. Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained
- b. Whether any assumptions made by MAF were wrong or unreasonable and, if so, why
- c. Whether uncertainty in the information was dealt with appropriately by MAF in its analysis
- d. Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions
- e. Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF

MAF provided the Panel with a number of documents that provide the background to the development of the import health standard (IHS). A number of process documents were also provided. The NBA also provided information supporting their position. The Panel has reviewed all of these documents and has selected summary points pertinent to each of the issues and questions as shown in Appendix A.

Conclusions

The Panel notes that there is some inconsistency associated with whether or not organisms are considered to be present in a region or not. In the New Zealand case there is a formal process under the Hazardous Substances and New Organisms (HSNO) Act (1996) that is triggered by an application to the Environmental Risk Management Authority (ERMA) to determine whether or not an organism is ‘present in New Zealand’. This system has operated since 1997.

In the MAF and the NBA papers there have been two bases for assumptions regarding whether or not an organism is present in New Zealand. In some cases it is assumed that an organism is not present if there have not been any reports of the organism. An example is where MAF has concluded that Western Australia (WA) is free of European Foulbrood (EFB) because there have not been any reports of presence. In other cases an absence of reports of presence has not been considered adequate for the organism to be considered to be ‘not present’. The latter position is assumed where there has not been an active programme of looking for the organism, or where there might be assumed to be a lag between introduction and observation. An example of this position is where MAF has concluded that Israeli Acute Paralysis Virus (IAPV) is probably present in New Zealand even though it has not been found. With respect to IAPV the NBA has concluded that IAPV is not present because it has not been found.

Both positions are valid as long as it is stated clearly up front which position is being adopted and why. The 2002 import risk analysis¹ does make this clear on page 13. This important contextual aspect is not included in the final import risk analysis².

However the MAF assumption regarding IAPV appears to be a departure from the approach taken by MAF for some other countries where the absence of detection is deemed to mean freedom from the virus. The Panel does not consider that it is appropriate to assume that IAPV is present in New Zealand.

The Panel has some concerns about an apparent inconsistency applied to lack of information more generally. The MAF risk analysis concludes that *P. alvei* should not be classified as a potential hazard as there is “insufficient evidence to suggest that this organism would interfere with the diagnosis of foulbrood in the absence of *Melissococcus pluton*, the causative organism of European foulbrood”². There is a lack of clarity in this statement and if there is some evidence, then it may require further analysis. There would also appear to be some confusion in this statement since the NBA concern is that the presence of *P. alvei* will interfere with the diagnosis of American Foulbrood (AFB).

A more critical aspect arises with respect to the assumptions around the effectiveness of heat treatment for *N. ceranae*. There is no evidence to support the position that heat treatment will be effective against *N. ceranae* and some evidence that suggest that it is ineffective, or at least that thermal tolerance will differ from that of *Nosema apis*.

The Panel concludes that there are active science programmes being undertaken for *N. ceranae* and IAPV, and that as a result the risk analyses previously undertaken by MAF are now out of date. The more recent science that has been undertaken since 2006 indicates that caution is required, and will support a more robust risk analysis.

The Panel concurs with the NBA that many of the differences of opinion between MAF and the NBA are linked to what is considered to be an acceptable risk or what is the appropriate level of protection. While consideration of the appropriate level of protection is explicitly excluded from the terms of reference for the Panel, this matter is critical and requires explicit consideration in terms of the context for the import risk analysis.

Recommendations

That

- the assumptions adopted in terms of whether organisms are considered to be present in New Zealand are stated clearly upfront in the import risk analysis, and that the reasons for making this assumption are clear and verifiable;
- MAF review the import risk analysis for *P. alvei* in light of the ERMA determination that *P. alvei* is not present in New Zealand, and that more explicit account be taken of uncertainty;
- MAF consider a further review of the 6D reduction strategy for heat treatment for EFB and explore further whether experimental verification is possible;
- less weight be put on the assumption that WA products will be free of disease agents, until both a more thorough initial survey and a systematic method for identifying new agents before there is a risk of them infiltrating exported goods. Regardless, it is prudent to treat honey and other hive products on the assumption that disease agents are present or will be at some point in the future;
- MAF reviews the risk analyses for *N. ceranae* and IAPV taking into account active recent science;
- MAF explicitly consider the differences in heat treatment survival in *N. ceranae* versus *N. apis*;
- IAPV be treated as a diverse agent with differing virulence and that surveys for this virus in WA and in New Zealand be carried out in a way that accurately identifies each strain and is useful for predicting strain-level impacts on bees; and
- the assessment of a negligible risk for bee products other than royal jelly in relation to IAPV should be revisited.

Discussion and analysis

The Panel has considered each of the questions posed by MAF and has summarised its analysis in the Tables in Appendix A. This section discusses the issues in terms of the particular organisms and aspects where there is dispute.

P. alvei

Discussion

MAF has stated³ that in the first draft of the bee products import risk analysis (not supplied to the Panel) the author (Mark Goodwin) concluded that *P. alvei* should be considered as a hazard on the basis that it could complicate AFB control. One of the reasons given for this was that New Zealand does not have EFB and has a programme to eliminate AFB⁴ and that therefore in the face of uncertainty it might be prudent to consider *P. alvei* as a hazard. However the three expert reviewers disagreed with this classification^{2,5} and the first published import risk analysis (2002)⁶ did not classify *P. alvei* as a hazard. This first published import risk analysis concluded that *P. alvei* is a saprophyte with widespread distribution and unknown status in New Zealand. This position was maintained in version 2 of the import risk analysis published in 2004⁷.

In his comments as a peer reviewer to the 2004 import risk analysis Mark Goodwin raises the matter again, stating that while both AIV⁸ and *P. alvei* have been shown to be pathogenic to honeybees in laboratory tests (yet there is no evidence from the field), AIV is classified as a hazard and *P. alvei* is not. Goodwin is of the view that there is not enough information to be able to conclude that *P. alvei* is not a pathogen. Goodwin challenges MAF's view that because the status of *P. alvei* is uncertain it should not be classified as a hazard, and notes that for consistency *M. plutonius* should be addressed similarly. Further, Goodwin disagrees with the MAF conclusion that there is no evidence that the presence of *P. alvei* complicates the diagnosis of AFB under field conditions. Goodwin also introduces questions about the effects of *P. alvei* on non bee species noting that if there were an application to the Environmental Risk Management Authority (ERMA) under the Hazardous Substances and New Organisms (HSNO) Act to introduce *P. alvei* into New Zealand then this matter would need to be addressed in some detail.

In 2006 MAF strengthened its position with respect to the presence in New Zealand of *P. alvei* stating MAF was satisfied that it had been diagnosed in New Zealand on [at least] one occasion^{9,7}.

In the revised import risk analysis (2006¹⁰) MAF maintains a similar stance; ie. that *P. alvei* is not a hazard in terms of effect on bees, that is has no effect on non bee species or any ability to complicate the diagnosis of AFB. Thus, no treatment measures are required by the IHS¹¹.

In 2006-7 MAF applied to ERMA under section 26 of the HSNO Act for a determination as to whether or not *P. alvei* was present in New Zealand. On the basis of the information

provided by MAF, the Authority determined that *P. alvei* was not present in New Zealand, and was therefore to be considered as a new organism¹².

National Beekeepers Association position

The NBA position with respect to *P. alvei* is summarised in NBA Volume 1, and confirms and extends the position taken by Mark Goodwin with respect to the 2002, 2004 and 2006 published import risk analyses.

The main points of the NBA argument are:

- that the general scientific view that *P. alvei* is a secondary invader of honey bee larvae that have died of other causes is based on one study (Bailey *et al* 1973)
- that MAF should have undertaken further analysis of the effect of *P. alvei* on non-bee species¹³
- that MAF did not conduct any research into the effect of *P. alvei* on the wider NZ environment despite its acceptance that *P. alvei* produces a heat labile toxin that would have an insecticidal effect¹⁴
- that there is a body of evidence that *P. alvei* may increase mortality in affected hives¹⁵
- that *P. alvei* has a tendency to replicate the symptoms of AFB and compromise its diagnosis¹⁶, and
- that *P. alvei* is not susceptible to heat treatment¹⁷

The NBA also noted that there may be potential issues arising from inconsistencies in AFB control between Australian States¹⁸.

In addition to the matters discussed above and the questions posed by MAF to the Panel the NBA introduces a concern about possible human health effects from the use of manuka honey-infused dressings¹⁹ since *P. alvei* may be capable of infecting wounds in humans. This matter is outside the Panel's terms of reference.

Panel conclusions

In reaching the following conclusions the Panel has focussed on the questions posed in the terms of reference.

The issue behind the three questions regarding *P. alvei* is whether or not *P. alvei* should be considered as a hazard in terms of the import risk analysis.

The Panel notes that there is a strong body of scientific opinion of the view that *P. alvei* is a saprophyte, that it is not a primary pathogen of honey bees and that it does not interfere with the diagnosis of AFB. This is confirmed by Hornitzky²⁰ who states that he does "not know of any other scientist working on matters relating to honey bees besides Dr Goodwin who considers *P. alvei* to be a primary pathogen of bees." The Panel does not believe this is a correct representation of Dr Goodwin's view and reads the documentation as stating

that Dr Goodwin does not consider that this area has been sufficiently addressed. The Panel notes that there is some uncertainty or lack of information about *P. alvei*. It is known that *P. alvei* is endemic in parts of Australia (though Hornitzky considers that “*P. alvei* is not present in honey bee colonies in EA at detectable levels”¹⁷). The published import risk analyses appear to have adopted the position that while the status of *P. alvei* in New Zealand was formally unknown, it was likely that it was present and simply had not been found (it had not been looked for).

The Panel’s view is that given the ERMA determination that *P. alvei* is not present in New Zealand and should thus be considered as a new organism, and given that it is considered likely that the introduction of honey products will lead to the introduction of *P. alvei*²¹, that the import risk analysis should be revised and should reconsider whether or not to include the consideration of *P. alvei* as a hazard. A more explicit discussion on uncertainty and its impacts on the industry would be valuable. The Panel recommends that DoC be consulted as part of this revision since their initial analysis was conducted on the basis that *P. alvei* was probably present in New Zealand.

Regarding the specific questions posed in the terms of reference with respect to *P. alvei*:

- the Panel does not believe that the potential for adverse effects on non bee species is proven either way and recommends further analysis – in particular the Panel suggests that DoC be asked to review this area in light of the ERMA determination that *P. alvei* is not present in New Zealand
- the Panel similarly recommends that there be further review of the import risk analysis for adverse effects on honey bees – the lack of literature in the area is of concern
- the Panel notes the two opposing positions with respect to the potential for misdiagnosis of AFB in the presence of *P. alvei* – in this instance the Panel believes that there is sufficient evidence to support MAF’s view (based on followup information from Hornitzky) that *P. alvei* does not interfere with diagnosis of AFB

In summary the Panel recommends that MAF review the 2006 import risk analysis for *P. alvei* in light of the new information that *P. alvei* is not present in New Zealand, and that this analysis consider more explicitly the impact of uncertainty. The Panel acknowledges that under the MAF import risk analysis procedures consequence analysis is only undertaken if an organism is considered to be a hazard. The preliminary analysis that is used to determine whether or not the organism is a hazard must take into account the possible consequences of the organism but does not comprise an in-depth analysis. While MAF has stated that they do not deal in possibilities, prudence in the face of uncertainty would appear to be appropriate here until disease impacts of *P. alvei* are ruled out.

European Foulbrood

Discussion

The issues that the Panel has been asked to address in terms of EFB are the effectiveness of heat treatment in reducing the levels of *M. plutonius*, the primary disease agent for EFB, in honey, and the likelihood of *M. plutonius* being introduced in untreated honey from WA.

The MAF position is that honey treated to achieve a 6D reduction in *M. plutonius* and other candidate EFB disease agents would reduce it to a level where there would not be any realistic possibility of the disease being transmitted by honey, and compares this reduction to that applied internationally to milk for the foot and mouth virus²². MAF notes that there are a number of ways of achieving this reduction and has used modelling and statistical analysis to predict time-temperature curves that will achieve this result²³. However, the Panel notes that it does not appear to be possible to verify the reduction experimentally. While this treatment does not totally remove the possibility of a *M. plutonius* infection occurring through importation of honey from areas where this agent is present MAF is satisfied that the possibility is so remote as to be non-existent.

The draft IHS allows for honey that has not been heat treated to be imported from WA. In 2002 MAF advised the Minister of Biosecurity not to recognise WA as free from EFB²⁴. Almost immediately MAF reconsidered on the basis that this decision would be inconsistent with the approach taken for some Pacific Island countries, and that such an inconsistency would put New Zealand in breach of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS agreement)²¹. This revised decision was not formally established (though MAF did not advise WA that its claim for EFB status had been declined originally). In 2006 New Zealand implicitly recognised WA freedom from EFB in briefings in association with the requirements of the draft IHS, in which honey from WA was not required to have heat treatment for EFB. In 2006 MAF inspected the WA border control system and was satisfied that the border was secure.

National Beekeepers Association position

The NBA position is that heat treatment cannot confidently be relied on to prevent the introduction of EFB²⁵. The primary concern here is related to how reliable the treatment is in terms of the mechanics of the process²⁶ with a secondary concern with respect to verification of the efficacy. The NBA documents provided to the Panel raise similar issues to those raised in the NBA submissions on the 2006 draft IHS²⁷.

MAF is confident that a 6D reduction in organisms is sufficient to prevent an outbreak of EFB, but the NBA asserts that since the pre-treatment concentration of EFB in Australian honey is unknown this is not necessarily adequate²⁸.

With respect to the likelihood of EFB entering New Zealand from WA, the NBA does not believe there is sufficient interstate border control to prevent untreated bee products from entering WA and subsequently being exported to New Zealand, noting that EFB is present

in all other states in Australia except WA. The NBA view is that it is only a matter of time before EFB reaches WA. WA is more likely to have an outbreak of EFB than NZ (land borders, internal travel, and WA allows heat treated honey from other Australian states). This opinion is largely based on the 2001 report to MAF on the EFB status of WA²⁹, which also states that the chance of EFB establishing in WA from importation of small quantities of honey imported by travellers is high.

The NBA believes that it is likely that there could be a significant delay between EFB becoming established in WA and being detected and that this is a key concern³⁰. Hornitzky³¹ states that in his view current detection methods are much improved from the 70s and 80s. He states that WA operates a constant surveillance regime for EFB and that in his opinion “There is no reason to believe that an outbreak of EFB in WA would not be detected quickly”.

Panel conclusions

The Panel notes that the proposed 6D reduction in organism numbers for heat treatment for EFB appears to be somewhat arbitrary, since there does not appear to be any verifiable linkage between the reduction and the ability of organisms to cause infection/an outbreak of EFB. In particular, better numbers would help to anticipate the *M. plutonius* spore load found in Australian honey and the degree to which a 6D-reduced level of this spore load could or could not initiate disease. Temperature sensitivities should be more explicit for each potential risk species. However, we accept that the measures proposed by MAF represent current best practice.

The NBA has expressed concern about the practical use of heat treatment in terms of the reliability of the equipment used. The Panel is of the view that if a Biosecurity measure requires a certain level of treatment MAF must accept signed declarations that this has been achieved, and that mandated treatments be conservative with respect to risk of viable organisms surviving.

The Panel agrees that it is in WA’s interests to remain EFB free and thus to maintain strict border controls. While there is some validity to the NBA position that because EFB has not been found in WA does not mean it is not present, we accept that there is sufficient commercial pressure on WA to maintain EFB free status for them to actively seek to ensure that their border is not breached.

However, we note that the original 2001 report on the EFB status of WA initially resulted in MAF declining to accept that WA as EFB free at the same time as noting that some of the Biosecurity procedures applied by WA were superior to those applied by MAF. MAF then apparently withdrew this position internally while not changing its formal position. It is a little unclear as to whether MAF applied scientific criteria to making the revised determination accepting that WA had EFB free status. The stated reason that the initial determination was changed because it was inconsistent with the approach adopted with respect to some Pacific Island countries does not give confidence. While MAF recognition of WA EFB free status is implicit in the 2006 IHS which does not require heat treatment for EFB from WA there was no mention in the paperwork of a formal change from the original

briefing to the Minister of Biosecurity. This is confirmed in the summary of information on file on the WA freedom case for EFB³² which concludes that while the IHS implies acceptance WA's case for EFB freedom, MAF does not appear to have evidence of formal acceptance.

In summary the Panel accepts MAF's position and the requirements of the IHS that heat treatment designed to ensure a 6D reduction in organisms associated with EFB is adequate to manage the risk of the introduction of EFB to an acceptable level. Notwithstanding, the Panel recommends that MAF consider further review of the 6D reduction strategy and explore further whether experimental verification is possible.

With respect to the second question the Panel accepts that EFB might be introduced to New Zealand if it were to reach WA and not be detected before it was imported in honey to New Zealand. However, the Panel agrees that it is in WA's best interests to ensure that it remains vigilant and accepts that WA operates a surveillance regime that should detect EFB promptly. Thus we consider that the chance or likelihood of such an introduction is low for this agent.

N. ceranae

Discussion

The issues that the Panel has been asked to address in terms of *N. ceranae* are similar to those for EFB; namely, the effectiveness of heat treatment in reducing the level of *N. ceranae* in honey, and the likelihood of *N. ceranae* being introduced in untreated honey from WA.

Addressing the former matter, the Panel notes that *N. ceranae* is native to a warmer environment than *N. apis* and it is conceivable that this species is more resistant or hardier in terms of heat treatments (Martin-Hernandez et al., 2009³³). With respect to the likelihood of *N. ceranae* being introduced in untreated honey from WA the Panel notes that *N. ceranae* appears to be highly mobile and therefore frequent surveys of WA and especially of potential exporters are essential to ensure that *N. ceranae* is detected and the likelihood of introduction to New Zealand is minimised. The Panel believes that catching new *N. ceranae* populations in WA soon enough to assure no risk to New Zealand will be challenging.

From the MAF perspective the Panel notes that:

- *N. ceranae* was not addressed in original risk analyses
- additional work has been done since the draft IHS was published
- the MAF position in the risk analysis that “there is no reason to suspect that *N. ceranae* spores are more heat resistant than *N. apis* as the organisms are so closely related”³⁴
- the MAF position is that *N. ceranae* has not been found in bees in Tasmania or WA³⁵.

National Beekeepers Association position

The National Beekeepers Association position is that

- *N. ceranae* has been found in four states in Australia (not Western Australia or Tasmania) – it is more detrimental than *N. apis* and not able to be eradicated³⁶.
- *N. ceranae* is not new – it has just taken a long time to be recognised. Not being detected in WA and Tasmania does not mean it is not present.
- there are concerns about the efficacy of heat treatment– no margin for error – precision required is “beyond the capacity of normal commercial heating equipment” (para 8) – issues of equipment failure (paras 26 -), operator error (paras 29-) and verification (paras 32-)^{37,38} – see also response to Barnes and Zemke-Smith³⁹
- there has not been any validation of heat treatment for *N. ceranae*

Panel conclusions

Information on the disease impacts and range of *Nosema ceranae* is changing with an unusual frequency. This pathogen was not recognized in *A. mellifera* prior to 2006 but now appears to be widespread on several continents, including Australia, North and South

America, and Europe (Fries et al., 2006⁴⁰, Klee et al., 2007⁴¹, Chauzat et al., 2007⁴², Chen et al., 2008), along with Asia (Huang et al., 2006⁴³), the presumed point of origin for this species. Reports are similarly divergent regarding the impact of this parasite on honey bees, ranging from those providing evidence for a severe impact on both individual bees and on colonies (e.g., Higes et al., 2008⁴⁴) to those suggesting a longer-term and perhaps less virulent history (Chen et al., 2008⁴⁵, Pajuelo et al., 2008⁴⁶). Regardless, both the range and infection intensity of *N. ceranae* are clearly increasing, and this parasite has changed management strategies in many countries in which it is now found.

While this parasite is not yet identified from Western Australia, the apparently rapid spread in other parts of the world indicates that *N. ceranae* is adept at transport via infected bees, hive components, and/or hive products. *N. ceranae* seems to tolerate an especially wide environmental range, from the Asian tropics to far Northern Europe, and little is known currently on precisely how the biology and environmental preference of this parasite differ from those of the better known *N. apis*.

Given the changing research landscape for *N. ceranae*, the Panel recommends caution with respect to declaring current range limits for this parasite, and with respect to determining both treatment regimes, effective disease, and the impacts of heat treatment for hive products.

Israeli Acute Paralysis Virus

Discussion

This virus was first identified in Israel in 2004. MAF needed to therefore introduce a draft supplementary paper into its hazard and risk analysis⁴⁷. The MAF conclusion was that as IAPV had been found in royal jelly and as royal jelly had been imported into NZ for several years it was probable that IAPV was already present in New Zealand.

It is accepted by the parties that IAPV is present in the Australian states excluding WA and Tasmania. MAF has taken the position that because the virus has not been identified in those two states they must be assumed to be clear of the virus.

The virus has not been identified in New Zealand yet MAF makes the assumption that it is here but has not been identified. This seems a departure from the approach taken by MAF for some other countries where the absence of detection is deemed to mean freedom from the virus, etc. However it seems that it is not appropriate to apply the same logic to a virus which has not been detected in New Zealand. The question is why should NZ be assumed to have the virus when it has never been detected here?

The MAF draft paper considers the possibility that some earlier overseas identification of Kashmir Bee Virus (KBV) could in fact have been isolates of IAPV. As KBV is present in New Zealand then, possibly, isolates of KBV in New Zealand may have been better described as IAPV. More recent research overseas has shown that IAPV is a virus quite distinct from KBV thus the original MAF assumptions are no longer correct.

Looking at bee products other than royal jelly MAF concluded that given the “fragility of dicistovirus” that it was unlikely that IAPV could be transported in other products. Therefore MAF assessed the risk for IAPV as negligible.

National Beekeepers Association position

The NBA does not agree with the MAF assessment that the risk for IAPV is negligible and quotes a 2005 paper which reports that KBV has been found in honey⁴⁸. On page 20 of the same submission another paper (Palacios et al, 2008) is quoted which “noted that IAPV lineages have now been found in US bees, one of which correlates with IAPV found in shipments of Australian bees”.

Panel conclusions

The Panel notes that MAF tend to be rather dismissive of a 2007 paper by Cox-Foster⁴⁹, especially since the proposed novelty of IAPV in the US was undermined by evidence that this virus had been present there for some years (Chen and Evans, 2007⁵⁰), but do not appear to have picked up the 2008 paper by Palacios *et al.* The distribution and disease impacts of this virus remain an active field of study.

The assessment of a negligible risk for bee products other than royal jelly in relation to IAPV should be revisited, since IAPV stability in hive products, and viral copy numbers needed for disease are unknown. It is also apparent that this virus shows strain-level differences in virulence, and the Panel recommends a more full review of strains likely to be introduced to New Zealand and their proposed impacts on bees.

Appendix A

Abbreviations used

MAF – Ministry of Agriculture and Forestry

BNZ – Biosecurity New Zealand

NBA – National Beekeepers Association

AFB – American FoulBrood

EFB – European Foulbrood

ERMA – the Environmental Risk Management Authority

HSNO Act – the Hazardous Substances and New Organisms Act 1996

MAF view of differences between BNZ and stakeholders is that they relate to differences in perceptions of risks and their acceptability rather than to interpretation of scientific information.

A key obligation under the SPS agreement is that sanitary and phytosanitary measures must be based on scientific principles and maintained only while there is sufficient scientific evidence for their application. In practice this means that unless MAF is using internationally agreed standards, all sanitary measures must be justified by a scientific analysis of the risks posed by the imported commodity⁵¹.

The following tables summarise the NBA position, the MAF response and the Panel's commentary and conclusions for each of the nine issues for which the Panel was asked to respond. These tables are not necessarily complete. Where several documents referred to the same position usually only one sample reference has been included.

It has proved difficult to analyse whether or not MAF addressed uncertainty appropriately. Given the significant uncertainty associated with some of the organisms that might be imported in conjunction with bee products, it would be valuable if the risk analysis supporting the IHS had a more explicit explanation of how the appropriate level of protection is derived in these cases, and how it is applied. This will assist both reviewers and external parties.

2(a) The effects of *P. alvei* on non-bee species

NBA position	
That <ul style="list-style-type: none"> • MAF should have undertaken further analysis of the effect of <i>P. alvei</i> on non-bee species (NBA Vol 1, item 1, para 14; NBA Vol 1, item 1, para 30, 32-33). • That MAF did not conduct any research into the effect of <i>P. alvei</i> on the wider NZ environment despite its acceptance that <i>P. alvei</i> produces a heat labile toxin that would have an insecticidal effect (NBA Vol 1, item 1, page 4) • That there is evidence to support the view that <i>P. alvei</i> may act as a pathogen of honey bee larvae and other organisms (NBA Vol 1 Item 2 page 23) 	
MAF/BNZ position	
That <ul style="list-style-type: none"> • there are a few reports of <i>P. alvei</i> being used as a potential bio control agent for insects such as mosquitoes, and notes that there has been no evidence of effects outside the laboratory – further <i>P. alvei</i> has never been recognised as a suitable bio control for mosquitoes under natural conditions. (see also MAF item 25) (MAF item 28) (MAF item 17, page 26, para 13.15 in response to a submitter “We have heard that in other countries <i>P. alvei</i> is being used as a biological insecticide on flies” – questions effect on insects) That <i>P. alvei</i> should not be classified as a hazard for the purposes of the risk analysis. 	
Common ground	
That <ul style="list-style-type: none"> • <i>P. alvei</i> not present in New Zealand but common ground that over time with importation of honey from eastern Australia it will arrive (NBA Vol 1, item 1 page 9 footnote 4). <i>P. alvei</i> has now been determined to be a new organism (by ERMA) therefore the previous analysis conducted on the basis that it was not a new organism should be revisited. 	

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	MAF does not appear to have misunderstood or misinterpreted any of the scientific information available to it at the time of the analysis. Since the draft IHS was published further information has become available and MAF should therefore incorporate revising the risk analysis for <i>P. alvei</i>
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	MAF assumed that <i>P. alvei</i> was present in New Zealand – this assumption was incorrect (as per ERMA determination that <i>P. alvei</i> is a new organism (12 February 2007) consequently this coloured MAF’s response to any question about <i>P.</i>

		<p><i>alvei</i>.</p> <p>MAF's view is that <i>P. alvei</i> is harmless (see above) – but has not undertaken a consequence analysis to reach this conclusion (NBA Vol 1, item 1, para 37). The fact that DoC did not raise a concern with respect to the effects on non-bee species is not relevant.</p>
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	<p>Given the assumptions used as the basis for the risk analysis MAF has generally addressed uncertainty appropriately. However, given the (now known to be) incorrect assumption that <i>P. alvei</i> was present in New Zealand the consideration of uncertainty should be revisited.</p> <p>Despite the lack of evidence as to the presence in New Zealand it was inferred that <i>P. alvei</i> is present. This is not good practice.</p> <p>There is considerable uncertainty about the effects of <i>P. alvei</i> in connection with the three questions posed and given that <i>P. alvei</i> is not present in New Zealand a more precautionary approach might be adopted. MAF adopts the view that where there is uncertainty while a precautionary approach may be adopted, any measures must be based on a scientific risk assessment (as per the SPS agreement). This is not satisfactory where there is little or no scientific information available and is inconsistent with all forms of the precautionary principle.</p>
3(d)	Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions	Scientific evidence supports the view that <i>P. alvei</i> is not present in New Zealand.
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	ERMA determination that <i>P. alvei</i> is not present in New Zealand warrants further consideration of the consequences of the introduction of <i>P. alvei</i> and whether or not <i>P. alvei</i> should be classified as a hazard. This requires further consideration of the effects if <i>P. alvei</i> should be introduced, and in particular requires consideration of whether there are risks to non bee species.

2(b) The effects of *P. alvei* on honey bees

NBA position
<p>That</p> <ul style="list-style-type: none"> • there is a body of evidence that <i>P. alvei</i> may increase mortality in affected hives (NBA Vol 1, item 1, para 15 and paras 42-49) • there is evidence to support the view that <i>P. alvei</i> may act as a pathogen of honey bee larvae and other organisms (NBA Vol 1 Item 2 page 23)
MAF/BNZ position
<p>That</p> <ul style="list-style-type: none"> • <i>P. alvei</i> is harmless with respect to honey bees, and should not be classified as a hazard for the purposes of the risk analysis. <i>P. alvei</i> cannot proliferate in the absence of EFB (NBA Vol 1, item 1, paras 55-56). • <i>P. alvei</i> is not a primary pathogen of bees; it is a saprophyte that invades bee larvae killed by EFB; and in the absence of EFB <i>P. alvei</i> does not confused the diagnosis of EFB (MAF item 20, page 73, para 10.16) <p>In response to a submission on the 2004 risk analysis MAF states that while “there was some pathogenicity demonstrated in artificial conditions there is nothing in the mainstream scientific literature to suggest that <i>P. alvei</i> is anything other than a saprophyte that invades larvae killed by EFB” (MAF item 17, page 13, para 4.26).</p>

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	No, given available literature See also 2(a) above
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why.	It is optimistic to assume this species could not be a threat to honey bees. See also 2(a) above
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	The degree of uncertainty would suggest that <i>P. alvei</i> should have been included as a hazard. See also 2(a) above
3(d)	Whether the scientific evidence best supports MAF’s conclusions, or whether the scientific evidence better supports any other conclusions	The MAF conclusion is supported, barring uncertainty over <i>P. alvei</i> pathology See also 2(a) above
3(e)	Whether any information	See also 2(a) above

	not considered by MAF is sufficiently material to require further evaluation by MAF	
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2(c) The effects of *P. alvei* on the objectives of the National American Foulbrood Pest Management Strategy

NBA position	
That <ul style="list-style-type: none"> • <i>P. alvei</i> has a tendency to replicate the symptoms of AFB and compromise its diagnosis (NBA Vol 1, item 1, para 16 and later) • <i>P. alvei</i> is (may not be) not susceptible to heat treatment (NBA Vol 1, item 1, para 10) • there are potential issues arising from inconsistencies in AFB control between Australian States (MAF item 20, page 56, para 9.7). • the New Zealand situation is unique since EFB is not present and there is an AFB control programme in place. 	
MAF/BNZ position	
That <ul style="list-style-type: none"> • <i>P. alvei</i> should not be classified as a hazard for the purposes of the risk analysis predicated on the view the <i>P. alvei</i> was present in New Zealand (MAF item 27, pages 1-4 – Shimanuki, Brown and Ball). • That the level of uncertainty regarding the likelihood that this organism would significantly interfere with the AFB PMS is not sufficiently high to warrant imposing risk management measures on imports of honey bee products for this organism” (MAF item 17 page 14). (MAF item 29) • “There is insufficient evidence to suggest that this organism would interfere with the diagnosis of foulbrood in the absence of <i>M. pluton</i>, the causative organism of EFB”. (MAF 16, page 82). • That annual inspection is considered to provide a level of protection broadly equivalent to that achieved by the Strategy (noting that AFB is endemic in New Zealand). • BNZ risk management measures are in compliance with the SPS agreement and inconsistencies between measures applied in Australian States is not relevant (MAF item 20, page 57, para 9.7) • The disagreement is not over factual matters but over how the facts should be interpreted and how to make decisions in the face of scientific uncertainty (MAF item 34, page 5). 	

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	No See also 2(a) above

3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	The decision that <i>P. alvei</i> could not interfere with the diagnosis of AFB presumes that tests will be applied that are distinctive for the two, and these screens are not yet in place. See also 2(a) above
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	Uncertainty is not addressed appropriately – approach adopted implies that absence of evidence is an indicator for evidence of absence. See also 2(a) above
3(d)	Whether the scientific evidence best supports MAF’s conclusions, or whether the scientific evidence better supports any other conclusions	Some tests will confound these species, and there needs to be more information on how screens will be run.
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	Variants of <i>P. larvae</i> already in New Zealand vs. Australia, and distinctiveness of all v.v. <i>P. alvei</i> See also 2(a) above

2(d) The effectiveness of heat treatment in reducing the level of European Foulbrood in honey

NBA position	
That <ul style="list-style-type: none"> • heat treatment cannot be confidently relied on to prevent the introduction of EFB (NBA Vol 1 para 18). There is concern about efficacy of heat treatment (NBA Vol 2 item 7 paras 5-7 etc) – no margin for error – precision required is “beyond the capacity of normal commercial heating equipment” (para 8) – issues of equipment failure (para 26 -), operator error 29-) and verification (32-) – note response to Barnes and Zemke-Smith followup item 8. (MAF item 20, page 73, para 10.17) • The pre-treatment concentration of EFB in Australian honey is unknown (NBA Vol 2, item 5 page 2 para 3) and thus efficacy of heat treatment unknown (para 5) 	
MAF/BNZ position	
That <ul style="list-style-type: none"> • risks associated with EFB can be managed by heat treatment and that heat treatment is an effective management tool for reducing the likelihood of introduction of EFB to such a low level that the risk is negligible (MAF item 16, pages 73-75) – discussion of ‘safety’ of a 6D reduction. • heat treatment involving a 6D reduction in EFB in imported honey effectively prevents importation of EFB (MAF item 32 page 4) – Hornitzky • while MAF has confidence in the effectiveness of heat treatment it is only one of a number of barriers • that the risk mitigation measures recommended for bee products are consistent with measures applied to trade in other products that could affect New Zealand’s other primary industries such as dairy and meat”. (Item 20, page 16 para 3.11) 	

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	No
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	No. The presumptions that all estimates of heat treatment effects on efficacy were accurate

3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	The experimental results show some discrepancy.
3(d)	Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions	It would be preferable to explore more fully why the heat treatment results differed from each other
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	See 3(c) and 3(d)

2(e) The likelihood of European Foulbrood being introduced in untreated honey from Western Australia

NBA position (based on NBA Vol 2, Item 11 (Report done for MAF on status of WA as a disease free zone for EFB).

That

- there is sufficient interstate border control to prevent untreated bee products from entering WA and the being exported to New Zealand (MAF item 20 page 43, 8.5) and since EFB is present in all states in Australia except Western Australia it is only a matter of time before it reaches WA.
- WA more likely to have an outbreak of EFB than NZ (page 21) (land borders, internal travel, and WA allows heat treated honey from other Australian states)
- the chance of EFB establishing in WA from importation of small quantities of honey imported by travellers is high (page 9).
- the likely delay between EFB becoming established in WA and detection (NBA Vol 1 item 1 para 6) is a key concern.

MAF/BNZ position

That

- heat treatment is an effective management tool for reducing the likelihood of introduction of EFB to such a low level that the risk is negligible (MAF item 16, pages 73-75) – discussion of ‘safety’ of a 6D reduction.
- EFB has not been reported in WA and therefore WA must be considered to be EFB free. Therefore there is no reason to impose additional barriers and this would be in contravention of SPS requirements. The WA Department of Agriculture freedom from EFB case analysed in 2001 had two outstanding issues that MAF considers have been adequately addressed (Item 20, pages 13-15 para 3.7)
- there has been legislation and border control in place since 1977 (MAF item 20 page 43, 8.5; page 63, para 10.3) – these controls were verified by BNZ in 2006. There are natural barriers that restrict the natural drift of bees which could carry EFB into WA (MAF item 20, page 63 para 10.3) see MAF item 20, page 65, para 10.5 for information on surveillance programmes
- that there are natural boundaries that restrict the natural drift of bees which would carry European Foulbrood into WA
- there is no reasons to believe that an outbreak of EFB in WA would not be detected quickly (MAF item 32 page 4) – Hornitzky

Note: MAF item 37 discusses the MAF position wr.t. WA freedom from EFB and why MAF changed its mind from not recognising WA as being EFB free to recognising EFB freedom (based on consistency with recognition of some Pacific countries) and that the inconsistency would be a breach of NZ’s obligations under the SPS agreement.

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	The accuracy of screens in WA seems suspect for a recent invasion of this pathogen (the causative agent for EFB)
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	Yes. The assumption that it is extremely unlikely to get transport of <i>M. plutonius</i> to WA.
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	The screening to assure no presence in WA should be much more regular
3(d)	Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions	
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	The issue of screening requires further consideration

2(f) The effectiveness of heat treatment in reducing the level of *N. ceranae* in honey

NBA position
<p>That</p> <ul style="list-style-type: none"> • <i>N. ceranae</i> has been found in four states in Australia (not WA or Tasmania) – it is more detrimental than <i>N. apis</i> and not able to be eradicated (Hornitzky (2008) NBA Vol 2 item 2) (MAF item 23)). • <i>N. ceranae</i> is not new – it has taken a long time to be recognised. Not being detected in WA and Tasmania does not mean it is not present. • there has not been any validation of heat treatment for <i>N. ceranae</i> • there are general concerns about the efficacy of heat treatment (NBA Vol 2 item 7 paras 5-7 etc) – no margin for error – precision required is “beyond the capacity of normal commercial heating equipment” (para 8) – issues of equipment failure (para 26 -), operator error 29-) and verification (32-) – note response to Barnes and Zemke-Smith followup item 8.
MAF/BNZ position
<p>That</p> <ul style="list-style-type: none"> • there is no reason to suspect that <i>N. ceranae</i> spores are more heat resistant than <i>N. apis</i> – it is therefore reasonable to extrapolate the recommendations for <i>N. apis</i> to <i>N. ceranae</i> MAF item 20, page 78).

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	<p>MAF has assumed that heat treatment for <i>N. apis</i> will be equally effective for <i>N. ceranae</i> without providing any scientific evidence in support (MAF 20 page 78).</p> <p>MAF received information in May 2008 from M. Hornitzky (MAF item 23) that indicates (a) that the author was not aware of any heat treated studies carried out on <i>N. ceranae</i>, and (b) that such studies would be difficult to carry out.</p> <p>There were assumptions that this parasite would obey the same transmission and temperature-dependence limits found for the established <i>N. apis</i></p>

3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	The data for <i>N. ceranae</i> traits were and are changing rapidly.
3(d)	Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions	Recent work suggests that this parasite has a different thermal sensitivity to <i>N. Apis</i> and that this might affect the proposed heat treatment levels. Also, it is not evident that screens in WA can adequately preclude the arrival of <i>N. ceranae</i> .
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	The range and thermal tolerances of <i>N. ceranae</i> ought to be monitored more rigorously, and frequent surveillance mechanisms put in place to identify the timing of movement of this parasite to WA and possible export populations from Australia.

2(g) The likelihood of *N. ceranae* being introduced in untreated honey from Western Australia

NBA position
That <ul style="list-style-type: none"> • it is wrong to extrapolate recommendations for treatment of <i>N. apis</i> to treatment for <i>N. ceranae</i>, as they are different species (see page 26 for reference).
MAF/BNZ position
That <ul style="list-style-type: none"> • <i>N. ceranae</i> is more common in Queensland than <i>N. apis</i> – replacing <i>N. apis</i> – matter of time • <i>N. ceranae</i> is not known to be present in New Zealand (assumed not to be present) (MAF item 20, page 76).

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	No, although this hypothetical argument is testable. The review of <i>N. ceranae</i> biology is complete as of the time of document preparation, although this remains a very active research area.
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	Once introduced to new territory <i>N. ceranae</i> appears to increase rapidly in prevalence and infection loads in honey bees. If already in New Zealand this infection should by now be readily identified
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	Not in this case
3(d)	Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions	There is not yet scientific evidence for this parasite across New Zealand
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	Efforts have presumably been made by now to find this parasite, and those negative results, if indeed negative, are not discussed in the MAF report.

Additional Notes regarding *N. ceranae*

While the Terms of Reference for the Panel did not include a question about the likely effects of *N. ceranae* there is considerable discussion in the documents.

In June 2006 MAF concluded that *N. ceranae* should be classified as a hazard but determined it can effectively be managed by similar treatments to *N. apis*⁵².

There is no evidence that heat treatment is effective against *N. ceranae*⁵³. There is “strong indications that *N. ceranae* is replacing *N. apis* worldwide, though there has been some degree of misdiagnosis in the past.”⁵⁴

Hornitzky (2008)⁵⁵ reports that *N. ceranae* has been found in four states in Australia (not WA or Tasmania). It is more detrimental than *N. apis* and not able to be eradicated. It is not new – it has just taken a long time to be recognised, and not being detected in WA and Tasmania does not mean it is not there.

The status of WA regarding the presence of *N. ceranae* is unconfirmed⁵⁶ which raises the question of whether uncertainty is being managed properly.

Hornitzky is unaware of any studies carried out on the heat treatment of *N. ceranae*⁵⁷ and also notes that heat treatment studies would not be straightforward.

While a consequence assessment is discussed, there appears to be disagreement as to the consequences of introduction and MAF concludes that it is “unlikely that the introduction of the “new” strain of nosema into New Zealand would be responsible for increased levels of nosema disease”⁵⁸ without any supporting evidence.

Goodwin is of the view that the conclusion that recommendations for treatment of *N. apis* can be extrapolated to *N. ceranae* is erroneous since they are different species and *N. ceranae* is more pathogenic, thus it is simply not known⁵⁹.

The Panel concludes that all the information provided by MAF and the NBA indicates that *N. ceranae* – needs further investigation.

2(h) The likelihood of Israeli Acute Paralysis Virus being established in New Zealand as the result of importing bee products from Australia

NBA position
That <ul style="list-style-type: none"> IAPV has never been identified in New Zealand and that appropriate steps should be taken to ensure that it does not arrive and establish.
MAF/BNZ position
That <ul style="list-style-type: none"> IAPV is not known to be present in New Zealand, little is known about it the consequences of introduction “could be considered to be negligible” the likelihood of entry in honey bee products other than royal jelly is negligible (MAF item 24). the risk estimate for IAPV is negligible and it is not classed as a hazard in honey bee products⁶⁰.

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	The draft IHS was published in 2006. Since then, as outlined in the MAF report, IAPV appears to be fairly widespread worldwide. There are strains of this species with high virulence in bees and current distributions of such strains are unclear.
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	Yes. NBA Vol 1 item 2 – no basis for suggestion that it is present in NZ – but MAF says that because we have imported royal jelly from China for a long time that it is likely that IAPV is present [but it has never been detected]. Assuming that this is a monotypic species in terms of bee effects is likely to be inaccurate.
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	Probable need for caution As above, the evidence suggests that this viral species is widespread but rigorous tests have not established virulence of multiple strains.
3(d)	Whether the scientific evidence best supports MAF’s conclusions, or whether the scientific evidence better supports	The current evidence supports the claim that IAPV is widespread.

	any other conclusions	
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	This and other Dicistroviridae should be surveyed in New Zealand and the source populations to define ranges and thereby risk factors (in part).

2(i) The effects of Israeli Acute Paralysis Virus on New Zealand honey bees should it become established in New Zealand

NBA position
That <ul style="list-style-type: none"> the consequences of establishment of IAPV should be addressed in more detail there is no evidence that heat treatment is effective against IAPV (NBA Vol 1 item 1, para 12; NBA Vol 1, item 1, paras 74-75).
MAF/BNZ position
That <ul style="list-style-type: none"> IAPV is not known to be present in New Zealand, little is known about it, the consequences of introduction “could be considered to be negligible” and the likelihood of entry in honey bee products other than royal jelly is negligible (MAF item 24).

	Question for Panel	Panel commentary and interpretation
3(a)	Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained	NBA Vol 1, item 2 pages 14-15 Misinterpretation of the Chen and Evans (2007) article (caution that much work still needed) As above, IAPV strains might offer some risk to New Zealand bees, based on divergent results from different strains of this virus.
3(b)	Whether any assumptions made by MAF were wrong or unreasonable and, if so, why	
3(c)	Whether uncertainty in the information was dealt with appropriately by MAF in its analysis	This virus is new on the international research and regulation and there is much uncertainty regarding range and impacts where it is found.
3(d)	Whether the scientific evidence best supports MAF’s conclusions, or whether the scientific evidence better supports any other conclusions	There have not yet been studies on heat sensitivity or general stability of this virus. MAF is correct in that royal jelly is the only hive product to date with confirmed risk of IAPV transmission, although studies are scant.
3(e)	Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF	A direct query of current literature (since the MAF review) should help assess avenues for stable virus movement.

Other matters for consideration

A number of viruses present in New Zealand and not under official/active control have been considered in the risk analysis but have not been classified as ‘potential hazards’ because they are not under official control and “there is no evidence to suggest that more virulent strains exist abroad”. Given that there also appears to be considerable uncertainty (ignorance) about viruses not known to be present in New Zealand the Panel is of the view that there is significant uncertainty it might be preferable to be cautious and to consider exposure more carefully.

There is an associated issue around the scope of the analysis. It is not clear to the Panel how broad the hazard identification process is and the degree to which the process explores beyond the known associated organisms⁶¹. The analysis appears to concentrate on pests and diseases affecting production systems. The extent to which effects on native flora and fauna have been considered is not clear (notwithstanding the submission of the Department of Conservation).

In summary, MAF’s approach to addressing uncertainty adopts a more limited view of the nature of uncertainty than is found in the current literature, where uncertainty incorporates lack of knowledge and information beyond the narrow variation of probability and consequences measures. MAF’s approach results from a strict interpretation of the OIE guidelines and SPS agreement requirements.

Appendix B

TERMS OF REFERENCE

for

INDEPENDENT REVIEW PANEL

appointed to consider

SCIENTIFIC EVIDENCE IN DISPUTE

in relation to the

IMPORT HEALTH STANDARD for the IMPORTATION into NEW ZEALAND of SPECIFIED BEE PRODUCTS FROM AUSTRALIA

Background

1. The *Import Health Standard for the Importation into New Zealand of Specified Bee Products from Australia* was issued by the Ministry of Agriculture and Forestry under the Biosecurity Act 1993, in August 2006.
2. The Import Health Standard was the subject of legal proceedings brought by the National Beekeepers' Association of New Zealand.
3. The Import Health Standard was quashed by the Court of Appeal, following the Court's finding that honey from Australia containing *P. alvei* may not be imported without both biosecurity clearance under the Biosecurity Act 1993 and an approval for new organisms under the Hazardous Substances and New Organisms Act 1996.
4. Legislation was introduced to reverse the Court of Appeal's interpretation that an approval under the Hazardous Substances and New Organisms Act 1996 is required for known new organisms which might incidentally be imported in other products.
5. The amending legislation was passed in April 2008, and provides that the Import Health Standard is valid and effectual.
6. The amending legislation also provides that no biosecurity clearance may be given for any goods to which the Import Health Standard applies, until the Director-General of the Ministry of Agriculture and Forestry has –
 - a. Received a report from an independent review panel set up in consultation with the National Beekeepers' Association of New Zealand to

- consider the scientific evidence in dispute in relation to the Import Health Standard; and
- b. Determined whether any amendment to the Import Health Standard is necessary to achieve the purpose of Part 3 of the Biosecurity Act 1993; and
 - c. Publicly notified that determination.
7. These Terms of Reference have been prepared for the carrying out of the independent review by the panel.

Issues Referred to the Panel

- 1 The Panel is appointed to consider the scientific evidence as it relates to certain issues that are disputed by the Ministry of Agriculture and Forestry (MAF) and the National Beekeepers' Association of New Zealand.
- 2 The areas of science that are in dispute relate to:
 - a. The effects of *P. alvei* on non-bee species
 - b. The effects of *P. alvei* on honey bees
 - c. The effects of *P. alvei* on the objectives of the National American Foulbrood Pest Management Strategy
 - d. The effectiveness of heat treatment in reducing the level of European Foulbrood in honey
 - e. The likelihood of European Foulbrood being introduced in untreated honey from Western Australia
 - f. The effectiveness of heat treatment in reducing the level of *N. ceranae* in honey
 - g. The likelihood of *N. ceranae* being introduced in untreated honey from Western Australia
 - h. The likelihood of Israeli Acute Paralysis Virus becoming established in New Zealand as the result of importing bee products from Australia
 - i. The effects of Israeli Acute Paralysis Virus on New Zealand honey bees should it become established in New Zealand.
- 3 The Panel is requested to consider the following matters in relation to the areas of disputed science:
 - a. Whether MAF misunderstood or misinterpreted any of the scientific information that it obtained
 - b. Whether any assumptions made by MAF were wrong or unreasonable and, if so, why
 - c. Whether uncertainty in the information was dealt with appropriately by MAF in its analysis
 - d. Whether the scientific evidence best supports MAF's conclusions, or whether the scientific evidence better supports any other conclusions

- e. Whether any information not considered by MAF is sufficiently material to require further evaluation by MAF

Matters not referred to the Panel

The Biosecurity Amendment Act (No 2) 2008 provides for the Panel to consider disputed scientific evidence. The panel is not appointed to consider matters outside of this scope, such as:

- whether the measures included in the Import Health Standard achieve an appropriate level of protection for New Zealand; or
- whether measures within the Import Health Standard should be replaced or amended.

Procedures to be followed by the Panel

1. The Panel will be provided with a set of relevant documents that will be compiled by the Ministry of Agriculture and Forestry. A copy of those documents will also be provided to the National Beekeepers' Association of New Zealand.
2. The National Beekeepers' Association of New Zealand may, within two weeks of receiving the set of documents compiled by the Ministry of Agriculture and Forestry, provide the Panel with any additional documents that are relevant to the areas of disputed science. A copy of those documents will also be provided to the Ministry of Agriculture and Forestry.
3. The Panel will not conduct any hearings except with the prior approval of the Director-General of the Ministry of Agriculture and Forestry, in consultation with the National Beekeepers' Association of New Zealand.
4. The Panel may carry out its review by meeting together, or by communicating with each other by whatever means promotes the efficient completion of the Panel's function.
5. Remuneration for the Panel members, and other terms and conditions such as reimbursement of expenses, will be set out in each member's letter of appointment.
6. The Panel may, if necessary, seek additional relevant information from whomever it sees fit in meeting the terms of reference.
7. Following the provision of documents in accordance with paragraphs 1 and 2 above, neither the Ministry of Agriculture and Forestry nor the National Beekeepers' Association of New Zealand may communicate with the Panel in relation to its review, except as requested by the Panel.

8. The Panel must provide a report in writing, setting out its findings, no later than 90 days after receipt of any documents provided by the National Beekeepers' Association of New Zealand, or such later date as is agreed to by the Director-General of MAF.

EndNotes

- ¹ MAF item 2
- ² MAF item 16, page 82
- ³ MAF item 27 page 1
- ⁴ MAF item 26, pages 4-5
- ⁵ MAF item 27 page 2
- ⁶ MAF item 2
- ⁷ MAF item 4.
- ⁸ Apis Iridescent Virus
- ⁹ MAF item 29, page 2
- ¹⁰ MAF item 16
- ¹¹ MAF item 19
- ¹² ERMA decision on s2606009 dated 12 February 2007.
- ¹³ NBA Vol 1, item 1, para 14; NBA Vol 1, item 1, para 30, 32-33
- ¹⁴ NBA Vol 1, item 1, page 4
- ¹⁵ NBA Vol 1, item 1, para 15 and paras 42-49
- ¹⁶ NBA Vol 1, item 1, para 16 and later
- ¹⁷ NBA Vol 1, item 1, para 10
- ¹⁸ MAF item 20, page 56, para 9.7.
- ¹⁹ NBA Vol 1, Item 2, page 27
- ²⁰ MAF item 36, page 6
- ²¹ *P. alvei* not present in New Zealand but common ground that over time with importation of honey from eastern Australia it will arrive (NBA Vol 1, item 1 page 9 footnote 4). *P. alvei* has now been determined to be a new organism (by ERMA) therefore the previous analysis conducted on the basis that it was not a new organism should be revisited.
- ²² MAF item 35 + others
- ²³ See MAF item 21 for modelling and analysis commissioned by MAF
- ²⁴ MAF item 37 + others
- ²⁵ NBA Vol 2, item 11, page 8
- ²⁶ NBA Vol 2, items 7 and 8
- ²⁷ MAF item 20 page 47
- ²⁸ NBA Vol 2, item 5 page 2 para 3
- ²⁹ NBA Vol 2 item 11
- ³⁰ NBA Vol 1 item 1 para 6
- ³¹ MAF item 35
- ³² MAF item 31
- ³³ Martin-Hernandez R, Aranzazu M, Garcia-Palencia P, et al. (2009) Effect of temperature on the biotic potential of honeybee microsporidia. Applied and Environmental Microbiology 75, 2554-2557.
- ³⁴ MAF item 22, page 3
- ³⁵ MAF item 23
- ³⁶ Hornitzky (2008) NBA Vol 2, item 2; MAF item 23
- ³⁷ NBA Vol 2, item 7, paras 5-7 etc
- ³⁸ See also NBA Vol 1, item 1, paras 63-67
- ³⁹ NBA Vol 2, item 88.

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- ⁴⁰ Fries I, Martin R, Meana A, Garcia-Palencia P, Higes M (2006) Natural infections of *Nosema ceranae* in European honey bees. *Journal of Apicultural Research* **45**, 230-233.
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- ⁴⁷ MAF Item 24
- ⁴⁸ NBA Vol 1, item 2, page 19
- ⁴⁹ MAF item 24
- ⁵⁰ Chen YP, Evans JD (2007) Historical presence of Israeli Acute Paralysis virus in the United States. *American Bee Journal* **147**, 1027-1028.
- ⁵¹ MAF 17, page 4
- ⁵² NBA Vol 1, item 1, para 21; NBA Vol 1, item 1, para 77; MAF item 22, page 5
- ⁵³ NBA Vol 1, item 1, para 12; NBA Vol 1, item 1, paras 74-75
- ⁵⁴ (NBA Vol 1, item 2, Appendix 2
- ⁵⁵ NBA Vol 2, item 2; MAF item 23
- ⁵⁶ NBA Vol 1, item 1, para 86
- ⁵⁷ NBA Vol 1, item 1, para 80; MAF item 23
- ⁵⁸ MAF item 22, page 4
- ⁵⁹ NBA Vol 1, item 2, page 2
- ⁶⁰ MAF item 24
- ⁶¹ Effectively the question is what is meant by 'known'.