

REVIEW OF SUBMISSIONS ON:

DRAFT IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS FROM AUSTRALIA

DRAFT IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF BEE PRODUCTS FROM SPECIFIED PACIFIC ISLAND COUNTRIES

DRAFT IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS FROM ALL COUNTRIES



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INTRODUCTION

The draft import health standards for the importation into New Zealand of bee products from Australia, specified Pacific Island countries and all countries were notified in the Biosecurity New Zealand publication *Biosecurity*, Issue 65 - 1 February 2006.

Biosecurity New Zealand received submissions from the following:

Department of Conservation.....	received 10 February 2006
Brian Lancaster.....	received 19 February 2006
Lorimer's Honey, Hillcrest Apiaries.....	received 19 February 2006
Arataki Honey Ltd, Rotorua Division	received 20 February 2006
Central South Island Ward of the NBA.....	received 20 February 2006
Comvita New Zealand Limited.....	received 20 February 2006
MA Pollard.....	received 20 February 2006
National Beekeepers Association, NBA	received 20 February, 19 May and 7 June 2006
Airborne Honey Ltd.....	received 26 February 2006
Federated Farmers NZ Beekeeper Industry Group.....	received 27 February 2006

This document summarises the issues raised in the submissions, and presents the Biosecurity New Zealand response to each.

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ISSUED RAISED BY SUBMISSIONS

1 Department of Conservation

- 1.1. **The Department of Conservation submission states its concern that the import health standard for bee products from specified Pacific Island countries relies on the ability of the Official Veterinarian or Official Certifying Officer to know that European foulbrood, bee louse and small hive beetle are not present anywhere in their country. It questions the level of entomological knowledge on remote Pacific Islands and the reliability of communication channels and diagnostic services for rapidly reporting and identifying exotic organisms.**

Biosecurity New Zealand response

Over the next year, Biosecurity New Zealand officials will work with officials from the Ministry of Foreign Affairs and Trade (MFAT), Niue, Pitcairn Island, Samoa, Solomon Islands, Tonga and Tuvalu to ensure that honey bee product imports can be managed under the recommendations of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). Biosecurity New Zealand will ensure that it has a high level of assurance that government officials from these countries can certify that the honey bee products meet the requirements stated in the draft import health standard for bee products from specified Pacific Island countries. No final import health standard will be issued for honey products from specified Pacific Island countries until the implementation plan is completed for each country.

The first step in the process of developing the implementation plan will be an assessment of each country's honey bee health status. AgriQuality Ltd¹ assessed the honey bee health status of Niue and Samoa in preparation for the changes to New Zealand's import health conditions, and draft report on Samoa's honey bee health status has recently been completed. The report indicates that Samoa is still free from American foulbrood, European foulbrood, bee louse, small hive beetle, *Varroa* species mites and *Euvarroa* species mites². Biosecurity New Zealand is awaiting the results of a similar report on Niue's honey bee health status, but it is understood that Niue has an equally high honey bee health status. The honey bee health status of Pitcairn Island, Solomon Islands and Tuvalu needs to be re-assessed in a similar manner.

The next step will be to ensure that the government officials will be able to correctly diagnose endemic and exotic honey bee pests and diseases and approve a system for auditing each countries surveillance programme.

¹ The Government agency authorised by Biosecurity New Zealand under the *Biosecurity Act 1993* to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

² This report outlines a survey (carried out by AgriQuality Ltd) of 294 of Samoa's beehives out of the national total of 467 hives. This report states that the *Bee and Bee Product Prohibition Order* was issued in 1999 under the *Customs Act 1977*. This report also provides a plan for the training of Samoan government officials so that they will be able to correctly diagnose endemic and exotic honey bee pests and diseases.

- 1.2. The Department of Conservation submission questions that if certification of country freedom for European foulbrood, bee louse and small hive beetle cannot be relied on, then there are effectively no measures for these organisms in bee products. The result would be a higher risk of introduction of these organisms into New Zealand. The submission also requests that the import health standard for bee products from specified Pacific Island countries include the measures for small hive beetle and bee louse in drums of honey and comb honey which are included in the import health standard for bee products from Australia.**

Biosecurity New Zealand response

As mentioned above, Biosecurity New Zealand is interested in assisting those Pacific Islands with existing trade in honey bee products to develop robust systems for ensuring that officials can certify that countries are free from European foulbrood, bee louse and small hive beetle with a high level of assurance.

If Biosecurity New Zealand or any of these Pacific Island countries consider that it is not feasible for one of the countries to implement such a system, then Biosecurity New Zealand will develop another draft import health standard without freedom clauses which will include other measures from the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) to mitigate these honey bee diseases.

- 1.3. The Department of Conservation submission questions why there are no specific measures for royal jelly from Pacific Island countries as section 30.2.1.4 of the risk analysis suggests that small hive beetle could be present in fresh royal jelly that is not frozen or dried.**

Biosecurity New Zealand response

Clause 1 of the model veterinary certificate for bee products from Pacific Island countries includes sanitary measures for royal jelly. There are no conditions for small hive beetle in this draft import health standard other than a statement that small hive beetle has not been reported so the Pacific Island countries have maintained their freedom from small hive beetle at the time of export.

2 Brian Lancaster

- 2.1 In his submission on the draft import health standards, Brian Lancaster re-states his concerns that he first raised in his submission to the risk analysis that antibiotic resistant strains of American foulbrood will be imported in honey. He questions Biosecurity New Zealand's response 1.1 on pg. 6 of the review of submissions of the risk analysis, which states '*without continuous selection pressure for resistance in the form of antibiotic use, the persistence of these strains could reasonably expect to be limited*' and asks this statement to be '*backed by fact, including trials, before the industry is subjected to this assumption*'.**

Biosecurity New Zealand response

Biosecurity New Zealand considers that this matter has been adequately covered in the import risk analysis and review of submissions. The purpose of this review of submissions is to provide responses to submissions on the draft import health standards, rather than to provide alternative responses to previous submissions on the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

- 2.2 The Brian Lancaster submission questions whether the use of area freedom in a country is possible in a country that allows the feeding of oxytetracycline, as oxytetracycline prevents the full extent of any American foulbrood infections. The submission gives several reasons why area freedom cannot be recognised if there is not movement control legislation to prevent intentional movement of hives by beekeepers, robbing of hives, data base tracking and inspecting these hives.**

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) suggested that area freedom from American foulbrood was an option for risk management. However, Biosecurity New Zealand has not included this option in any of the draft import health standards, as country assessments have indicated that this is neither a practical possibility for Australia nor the specified Pacific Island countries.

Australia does not have areas that New Zealand recognises as free from American foulbrood. Although Biosecurity New Zealand recognised some of the specified Pacific Island countries as free from American foulbrood, Biosecurity New Zealand decided that this status needs to be monitored annually. Biosecurity New Zealand considers that the most effective way to ensure that this monitoring is carried out is to require an annual American foulbrood inspection in addition to regular whole country surveillance.

Any future Biosecurity New Zealand recognition of a country or territory as free from American foulbrood would be based on the history of imports and border controls, biosecurity legislation, active and passive surveillance, and whether American foulbrood is being suppressed by oxytetracycline feeding.

- 2.3 The Brian Lancaster submission questions Biosecurity New Zealand's response to his example given in his submission to the risk analysis which involved a worse case scenario where a 200 litre drum may be imported, dropped and spilt. In the review of the submissions to the import risk analysis, Biosecurity New Zealand stated that 'the 6D reduction recommended reduces the number of organisms by 99.9999%. This pathway is hypothetical; furthermore the risk analysis concluded that the risk is acceptable regardless of the pack size. Brian Lancaster stated that importation in a 200 litre drum would be a possibility rather than hypothetical.**

Biosecurity New Zealand response

Biosecurity New Zealand considers that this matter has been adequately covered in the import risk analysis and review of submissions. The purpose of this review of submissions is to provide responses to submissions on the draft import health standards, rather than to provide alternative responses to previous submissions on the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

2.4 The Brian Lancaster submission asks for further exploration of the dilution effect of a 6D reduction. He states that a 6D reduces number of organisms by 99.9999%, and asks how many organisms are likely to be in the following containers as he states that all these are pathways for honey:

- a 250 gm pack,
- a 500 gm pack,
- a 1kg pack,
- a 30 kg plastic pail, and
- a 200 litre drum.

The submission states that if any one of these containers was compromised anywhere in the country all bees within 3km radius would take all available honey back to their hives. It is the colony of bees that will become infected not individual bees. Under this scenario 1 spore in any one of the above containers will be enough to start an infection of European foulbrood because it will be taken back to a hive to start that infection. The submission asks how the risk posed by this scenario can possibly be acceptable as stated by Biosecurity New Zealand.

Biosecurity New Zealand response

Biosecurity New Zealand considers that this matter has been adequately covered in the import risk analysis and review of submissions. The purpose of this review of submissions is to provide responses to submissions on the draft import health standards, rather than to provide alternative responses to previous submissions on the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

3 Lorimer's Honey, Hillcrest Apiaries

3.1 The Lorimer's Honey submission opposes the concept of 'general' import health standards, such as the draft import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, on the grounds that, since the disease status of individual countries is constantly changing, bee products could be imported before an IHS was amended. Lorimers' Honey Ltd suggests that IHSs rather than permits should be drafted on a case-by-case basis when a country has asked to export product to New Zealand and should be at their cost. The submission also argues that import permits issued under the draft import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, should not be valid for up to 12 months and the disease status of any country could change within this period. They suggest that permits should only be valid for up to 2 months.

Biosecurity New Zealand response

A general import health standard has been in place for a number of years for specified bee products from all countries. The draft import health standard with the same title was an update of the existing import health standard that matched import conditions to the measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004), and removed the conditions for honey and propolis from Pacific Island countries. The import conditions for honey and propolis from Pacific Island countries were

then have moved into a separate import health standard with more stringent veterinary certification.

The purpose of the updated draft import health standard for specified bee products from all countries is two-fold. Firstly, it lists all of the bee products and commodities containing bee product ingredients which have been assessed by Biosecurity New Zealand against the import risk analysis as posing a negligible risk. Secondly, it informs importers how they can have composite products³ assessed on a case-by-case basis. It does not include any products that would need veterinary certification and so the conditions in this draft import health standard are not reliant on the disease status of the country.

When this import health standard is issued, permits will be used for composite products that have been assessed on a case-by-case basis as posing a negligible risk because of the way they are processed and packaged. This approach is preferable to using import health standards, because the risks posed by these products are not high enough⁴ to justify the greater staffing demands necessary for the development of an import health standard rather than an import permit. Since permits will not be issued for composite products that require veterinary certification of country freedom from a disease⁵, they can be issued for a 12 month period.

3.2 The Lorimer’s Honey submission opposes the draft import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, if the products covered in this import health standard contain added sugar. The members of the company state that it is the total sugar content that determines the products attractiveness to bees.

Biosecurity New Zealand response

Biosecurity New Zealand acknowledges that Lorimer’s Honey is correct that it is the percentage of honey, pollen, royal jelly and sugar that makes a product attractive to bees. However, given the variety and quantity of processed products that contain honey, Biosecurity New Zealand needed to adopt a 2% threshold from the HortResearch investigation on the attractiveness of honey sugar water. It was decided that this level

³ Defined as “A product which contains honey, pollen or royal jelly but is not classified by MAF as honey, pollen or royal jelly (i.e. products that have less than 50 % of honey, pollen or royal jelly by weight or volume). Examples of composite products include animal feeds, baked products, cosmetics, cereals, dressings, flavourings, jams, milk products, nutritional supplements, liquors, non-alcoholic beverages, mead, medicines, mustards, sauces, tonics, vinegars and wines.”

⁴ The development of import health standards takes at least six months. Because Biosecurity New Zealand has more requests for the development of import health standards than its resources, these requests are prioritised on an annual basis and it may take several years for a request to be completed. The significant delays that would result if these composite products required individual import health standards would be trade restrictive and would prevent Biosecurity New Zealand officials from making more important biosecurity decisions.

⁵ Note: If importers are interested in importing products which do not pose a negligible risk and require such certification, they will need to apply for an import health standard to be developed.

would be feasible and that asking for permits all products containing any honey would be impracticable.

Once the import health standard for specified bee products from all countries is issued, importers will be required to send information about processed composite products containing 2-50% honey to Biosecurity New Zealand for an assessment. The types of processed products which contain honey are usually heat treated to levels that exceed those in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). Biosecurity New Zealand will consider the sugar content of the composite products when an assessment is made.

- 3.3 The Lorimer's Honey submission points out that question 16 of the application form at the appendix of the draft import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL has a drafting mistake and does not make sense. The submission points out that this reinforces the fact that people make mistakes, and that official veterinarians may also make similar errors when signing export certificates resulting in the introduction of an exotic disease via imported product.**

Biosecurity New Zealand response

Biosecurity New Zealand acknowledges the numbering error in the draft import health standard and thanks the submitter for pointing that out, as this demonstrates the importance of the review process. Governmental veterinary services that are recognised by the OIE World Organisation for Animal Health⁶ as having authority in the whole country for implementing animal health measures and international veterinary certification process take the signing of such certificates extremely seriously and have robust systems to ensure appropriate review and auditing of export certification processes.

- 3.4 The Lorimer's Honey submission expresses concerns that the public will see heat treated bee products in New Zealand shops and try to import similar products that have not undergone heat treatment and are not certified accordingly. The submission suggests that a significant publicity campaign is required outlining that bee product imports are illegal unless they have undergone specific risk management measures to reduce disease risk and this campaign should be at the cost of the Government.**

Biosecurity New Zealand response

Commercial importers and the public already attempt to illegally import honey into New Zealand, and MAF Quarantine Service seizes significant volumes of honey at the border. Biosecurity New Zealand assumes that this will still be the case when Australian honey can be imported into New Zealand. New Zealand's border controls are the tightest in the world, including passenger declaration forms, signs, 100% baggage x-raying, the detector dog system and questioning by biosecurity inspectors at the border, and the system for

⁶ The OIE World Organisation for Animal Health is the international standard setting body for animal health. Information about the OIE and its terrestrial code (which covers honey bee pests and diseases) is available online at http://www.oie.int/eng/en_index.htm

notifying commercial importers of the current import health standards. Biosecurity New Zealand already invests heavily in publicity about the risks of bringing personal consignments of honey and communicating with commercial importers. Biosecurity New Zealand is confident that these systems will continue to manage the risks posed by illegal importation of honey by the general public and by commercial importers⁷.

3.5 The Lorimer’s Honey submission suggests that the model veterinary certificate for bee products from Australia should have details of the origin of the product making up the consignment in addition to the processing premises and registration number.

Biosecurity New Zealand response

Agreed. The state of origin will be added to the model certificate prior to the import health standard being issued.

3.6 The Lorimer’s Honey Ltd submission states that there is insufficient interstate border control to prevent bee products that have not undergone the required treatments from crossing to Western Australia and then exported to New Zealand

Biosecurity New Zealand response

In 2001 the MAF Biosecurity Authority⁸ was provided the following information from Western Australia:

- There are natural barriers that restrict the natural drift of bees which could carry European foulbrood into Western Australia. The environment (hot, lacking of water and year-round nectar/pollen sources) prevents the establishment and migration of feral colonies across the entire border between Western Australia and the eastern states. This has been validated by surveys of both the northern border area with the Northern Territory and the southern border area with South Australia, with no feral colonies being found. Only the south-west area of Western Australia is suitable to beekeeping. Although some bees are transported to the Kununurra area near the border with the Northern Territory for pollination, 20% of the hives sent north are inspected by the Department of Agriculture inspector for exotic diseases such as European foulbrood.
- Since 1977 there have been legislation and border controls to prevent the importation of bees, bee products and beekeeping equipment which could carry European foulbrood into Western Australia. While Commonwealth Laws allow the importation of honey and some hive products into Australia, all honey and hive products can not be imported into Western Australia because the state legislation, the *Beekeepers Act 1963* overrides the Commonwealth laws and prohibits their importation. Pasteurised honey⁹, refined beeswax and royal jelly may enter Western Australia subject to risk assessment, health certification and, where appropriate,

⁸ The section of MAF responsible for this biosecurity prior to the establishment of Biosecurity New Zealand in 2004.

⁹ Pasteurisation involves heating the honey to a core temperature of 65°C for at least 8 hours.

laboratory testing. Foods or health products containing honey, pollen, royal jelly, propolis and other hive products are restricted and subject to risk assessment prior to entry to Western Australia. Unpasteurised honey, honeycomb, unprocessed beeswax, pollen, bees, used hive equipment, used beekeeping appliances, queen bees, queen cells, packages (live bees in a wooden box), or other hive products are prohibited entry into Western Australia.

- Signs alerting travellers that honey and associated products can not be brought into Western Australia are in place at domestic and international airports. Detector dogs are trained to find bees, honey and other hive products at all Western Australian entry points. Dogs and X-ray machines are also used to detect illegal imports at all post offices that receive overseas or interstate mail. Since the ban on imports of live bees, honey products and equipment was introduced in 1977, none of these items have been detected entering the State by post.

These natural border and imposed border controls were verified by Biosecurity New Zealand during a technical tour in March 2006.

3.7 The Lorimer's Honey submission asks for information about how Western Australia has demonstrated area freedom for European foulbrood.

Biosecurity New Zealand response

The Western Australia Department of Agriculture submitted its freedom case to the Biosecurity Authority in 2001¹⁰. This freedom case was judged against the general requirements for zoning described in the *OIE World Organisation for Animal Health International Animal Health Code (2000)*¹¹.

These general requirements were that:

- The boundary of the disease-free zone must be established by veterinary administration and enforced by legislation.
- There must be constant supervision to prevent honey bees from crossing the boundaries of the state.
- There must be control of movement of bee products into the state.
- The state must maintain an effective veterinary organisation and infrastructure (in the case of bees, a government-sanctioned apiculture programme).

¹⁰ Information on the Western Australia European foulbrood freedom case is available online on at <http://www.biosecurity.govt.nz/pests-diseases/animals/european-foulbrood/western-australia-case/supporting-documents.htm>

¹¹ OIE World Organisation for Animal Health is the international standard setting body for animal health. Information about the OIE and its terrestrial code (which covers honey bee pests and diseases) is available online at http://www.oie.int/eng/en_index.htm

- The state must maintain adequate administrative and legal structures to carry out required actions.
- The state's veterinary administration must possess the necessary resources to supervise the boundaries, maintain clinical and epidemiological surveillance, and carry out necessary diagnostic tests for European foulbrood.

The Western Australia freedom case was also judged against the requirements for a disease-free zone described in the *OIE World Organisation for Animal Health Code* (2000). These requirements included:

- Official knowledge of the location of all apiaries.
- Immediate investigation of suspect outbreaks of European foulbrood.
- If necessary, a surveillance zone separating the state from the rest of the country.
- Importation of honey bees and bee products only under strict controls.

When the Western Australia European foulbrood freedom case was analysed in 2001, two issues were outstanding.

The first issue involved the low sensitivity of one of the methods used by Western Australia to detect the bacteria causing European foulbrood *Melissococcus pluton*, the Honey Culture Test, but this issue was dismissed by Biosecurity New Zealand for the following reasons.

- New Zealand also uses the Honey Culture Test to detect European foulbrood;
- Only 5% of Western Australia's testing system relies on the Honey Culture Test¹²; and
- Western Australia's surveillance system was considered in the 2001 review to be superior to that used in New Zealand to detect European foulbrood¹³.

¹² Analysis of the information submitted by Western Australia on their testing for European foulbrood from 1991-2000 shows that the use of the Honey Culture Test is insignificant. Only 4% of the European foulbrood tests involved the Honey Culture Test. 5% of the testing involved culturing brood and 92% of the European foulbrood testing involved visual inspection.

¹³ *The WA surveillance system for EFB is similar to the New Zealand system in respect to passive surveillance. However, the WA system includes random hive inspections by qualified personnel for the presence of EFB. These trained inspectors may be better able to detect EFB than most beekeepers, especially given the similarity between halfmoon disease (an innocuous syndrome which disappears after requeening) and EFB. WA also maintains sentinel hives in at-risk ports. This, together with the use of qualified personnel to inspect for EFB, means that the WA system may be more likely to detect the presence of EFB than the surveillance system currently in use in New Zealand, which does not have these elements.* (Retrieved online from (<http://www.biosecurity.govt.nz/pests-diseases/animals/european-foulbrood/western-australia-case/summary-of-wa-case.htm>))

The second more major issue concerned the importation into Western Australia of heat treated honey. Western Australia's requirement for heat treatment of honey was based on Wootton et al (1981)¹⁴ demonstration that heating to 60 degrees Celsius for 8 hours deactivates *M. pluton* in honey. In 2001, the Biosecurity Authority was uncertain whether this heat treatment provided an appropriate degree of protection and commissioned two pieces of research to address its uncertainty. These investigations¹⁵ demonstrated that the importation into Western Australia of heat-treated honey posed a negligible risk.

3.8 The Lorimer's Honey submission requests details of the Western Australia exotic disease response system.

Biosecurity New Zealand response

Responses to exotic diseases in all states and territories of Australia are covered under the *Australia Veterinary Emergency Plan, AUSVETPLAN*¹⁶. The *AUSVETPLAN, Disease Strategy Bee Diseases and Pests* (Version 3.0 2004) deals specifically with honey bees, and lists the following bee pests and diseases as emergency animal diseases: tropilaelaps mite (*Tropilaelaps clareae*); varroa mite (*Varroa destructor*); braula fly (*Braula coeca*); tracheal mite (*Acarapis woodi*); Asian bees (*Apis cerana*; *A. dorsata*; *A. florea*); Africanised bees (*Apis mellifera scutellata*) and other species of bees that might transmit bee diseases (*Apis adreniformis*; *A. labiosa*; *A. koschevnikovi*; *A. nigrocincta*; *A. nuluensis*; *A. mellifera capsensis* and *Bombus* spp of bumblebees).

3.9 The Lorimer's Honey submission questions the knowledge regarding bee diseases and risk management measures of official veterinarians who would sign export certificates for Australian bee products.

Biosecurity New Zealand response

Australia operates an equivalent system to that operating in New Zealand. Neither the New Zealand nor the Australian system requires the signing official to be an expert in bee diseases or risk management measures. These officials sign on behalf of the governmental veterinary services as part of a strictly controlled and audited system.

¹⁴ **Wootton, M., Hornitzky, M. Ryland L.(1981)** Thermal Destruction of Streptococcus-Pluton in Australian Honeys and Its Effect on Honey Quality. *Journal of Apicultural Research*, **20**, 115-120.

¹⁵ The first investigation involved trials over a wider range of temperatures than the Wootton et al (1981). This research applied a first order kinetic model to the data assuming a linear relationship between the logarithm of the number of survivors and time. The second investigation by Cox and Domijan (2004)¹⁵ involved predictive mathematical modeling and confirmed that European foulbrood would be killed at the range of time-temperature parameters listed in the import risk analysis and subsequent draft import health standard for bee products from Australia. The heating requirements required by Western Australia for imported honey exceed those determined by these investigations.

¹⁶ *AUSVETPLAN* has been developed and agreed by the Australian national, state and territory governments and relevant livestock industries to ensure that a prompt, efficient and effective response can be implemented with minimal delay. *AUSVETPLAN* provides a comprehensive package that sets out the agreed roles, responsibilities, coordination arrangements, financial arrangements (where applicable), policies (based on detailed technical support) and procedures that will be followed by all agencies in any emergency animal disease response. *AUSVETPLAN, Disease Strategy Bee Diseases and Pests Version 3.0 2004* is available online at http://www.animalhealthaustralia.com.au/programs/eadp/ausvetplan_home.cfm.

- In Australia, a state or territory government apiary officer (experienced in the diagnosis of bee diseases and risk management measures) provides eligibility documentation for the federal government Australian Quarantine and Inspection Service official veterinarian or certifying officer.
- In New Zealand, a government approved AgriQuality Ltd¹⁷ apiary officer experienced in the diagnosis of bee diseases and risk management measures provides eligibility documentation for the New Zealand Food Safety Authority Verification Authority official veterinarian. Biosecurity New Zealand officials in Biosecurity New Zealand are aware of any changes to disease status for each country and notify AgriQuality Ltd and the Verification Authority¹⁸ of changes to this disease status through the modification or revocation of the import health standards.

In both cases, it is an apiary officer who is experienced in apiculture who provides the information about the presence or absence of bee diseases. The official veterinarian or certifying officer does not need to be experienced in the diagnosis of bee diseases, but does need to be aware of the country's official disease status.

3.10 The Lorimer's Honey submission requests information about the type of surveillance programme that would be used to show that an area is free from a disease or pest and how this system would be audited.

Biosecurity New Zealand response

Biosecurity New Zealand does not have a standard policy for reviewing a surveillance programme. This is a complex assessment that requires Biosecurity New Zealand to make a judgment about the level of protection that is appropriate in a particular situation. As stated in response 3.7, Western Australia's European foulbrood freedom case was assessed by Biosecurity New Zealand against the general requirements for zoning described in the *OIE World Organisation for Animal Health International Animal Health Code (2000)*.

3.11 The Lorimer's Honey submission points out that Biosecurity New Zealand has admitted that heat treatment does not kill all European foulbrood spores and also the minimum infective dose is not known. Therefore, allowing product to be imported which may have live bacteria is not acceptable.

Biosecurity New Zealand response

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.

¹⁷ The Government agency authorised by Biosecurity New Zealand under the *Biosecurity Act 1993* to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

¹⁸ The Verification Agency is part of MAF Biosecurity New Zealand New Zealand Food Safety Authority.

3.12 The Lorimer's Honey submission questions why irradiation is considered an option for imported product when it is not an option for New Zealand product.

Biosecurity New Zealand response

Although irradiation is considered to address biosecurity concerns in imported bee products, permitting irradiated food to be imported into New Zealand or not is a food safety issue, and is therefore the responsibility of New Zealand Food Safety Authority.

However, Biosecurity New Zealand is aware that the irradiation of food is subject to the *Australia New Zealand Food Standards Code. Standard 1.5.3 Irradiation of Food* which prohibits irradiation of food unless specific permission is given. The draft import health standards have two clauses to inform importers that there may be additional regulations relating to food safety. The first clause is clause 2.1 which states that:

Commercial consignments of products imported into New Zealand for human consumption must comply with the Food Act 1981. These requirements are independent of the import health standard requirements and are managed by the New Zealand Food Safety Authority (NZFSA). Importers are advised to consult the NZFSA website: www.nzfsa.govt.nz/imported-food/index.htm or contact the NZFSA.

The second clause is note 4 following clause 7.3 which states that:

Irradiated foods intended for human consumption are not eligible for import into New Zealand unless they have been through a pre-market safety assessment process conducted by the Food Safety Association of New Zealand. Further information is available from the New Zealand Food Safety Authority website at <http://www.nzfsa.govt.nz/consumers/food-safety-topics/food-processing-labelling/food-irradiation/index.htm>.

This note explains the need for a pre-market safety assessment and if importers look at the website link they will see that bee products are not listed as one of the irradiated foods eligible for import into New Zealand. Honey bee products incorporated into medicines and nutraceuticals, such as pollen capsules, are not defined as foods and may be eligible for import. Importers should contact the New Zealand Food Safety Authority to check the eligibility status of any bee products as this status may change.

3.13 The Lorimer's Honey submission asks whether irradiation penetrates to the core of a honey container.

Biosecurity New Zealand response

As stated in 3.12, irradiated honey is not eligible for import into New Zealand at this point in time because of food standards. If in the future, honey irradiated in Australia was to be eligible for import, Biosecurity New Zealand, New Zealand Food Safety Authority, Australian Quarantine and Inspection Service, the Department of Agriculture, Fisheries, and Forestry, and the Food Standards Australia New Zealand would negotiate a protocol that ensured that the minimum level of irradiation of a honey container was that

recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) to mitigate the risk of European Foulbrood.

3.14 The Lorimer's Honey submission argues that clinical symptoms of American foulbrood can show up from 21 days and that the 12 month requirement for inspection is too long. As New Zealand beekeepers are required to report American foulbrood within 7 days of finding clinical symptoms, the two requirements for American foulbrood are not equivalent.

Biosecurity New Zealand response

The risk management measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) are designed to ensure that the level of spores in imported honey is not significantly greater than that in New Zealand produced honey, in order to be compliant with the *World Trade Organisation Sanitary and Phytosanitary Agreement*¹⁹.

Certification that the honey was not derived from hives known or suspected to be clinically affected by American foulbrood on an annual inspection is considered to provide a level of protection that is broadly equivalent to that achieved by the New Zealand American Foulbrood National Pest Management Strategy.

American foulbrood is an endemic disease in New Zealand, and the New Zealand American Foulbrood National Pest Management Strategy legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*²⁰ is focused on transmission from hive to hive rather than transmission through commercially packed honey. This is reflected in the absence of any requirement in the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* for beekeepers to check the American foulbrood status of hives at the time of honey harvesting, or for commercially traded honey to contain less than a minimum level of spores.

3.15 The Lorimer's Honey submission states that feeding of oxytetracycline to control European foulbrood will mask the symptoms of American foulbrood and asks that a declaration about oxytetracycline is added to the veterinary certificate to ensure that the honey does not contain residues and to prevent contamination of the honey with high levels of American foulbrood spores.

Biosecurity New Zealand response

Biosecurity New Zealand considers that the level of American foulbrood spores in honey will be, broadly speaking, proportional to the level of clinical disease in the hive. Therefore, hives that have a low level of clinical disease can be considered to have a low

¹⁹ Information about the *World Trade Organisation Sanitary and Phytosanitary Agreement* is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>

²⁰ The *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* is available online at <http://www.knowledge-basket.co.nz/regs/regs/text/1998/1998260.txt>

level of spores in any products, regardless of how that low level of signs is achieved, and having a declaration about oxytetracycline cannot be justified from a biosecurity perspective.

3.16 The Lorimer’s Honey submission questions whether there are different strains of American foulbrood in Australia.

Biosecurity New Zealand response

This issue is discussed on page 58 of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) where it is stated that ‘*there are no reports of strains of P. l. larvae with differing pathogenicity*’.

3.17 The Lorimer’s Honey submission asks for the reference proving that 120 degrees C for 24 hours is sufficient to kill American foulbrood spores.

Biosecurity New Zealand response

The reference is provided in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) (cited on page 63, listed on page 66).

3.18 The Lorimer’s Honey submission requests more information about surveillance and reporting systems to detect small hive beetle and bee louse in the states in which these pests are exotic.

Biosecurity New Zealand response

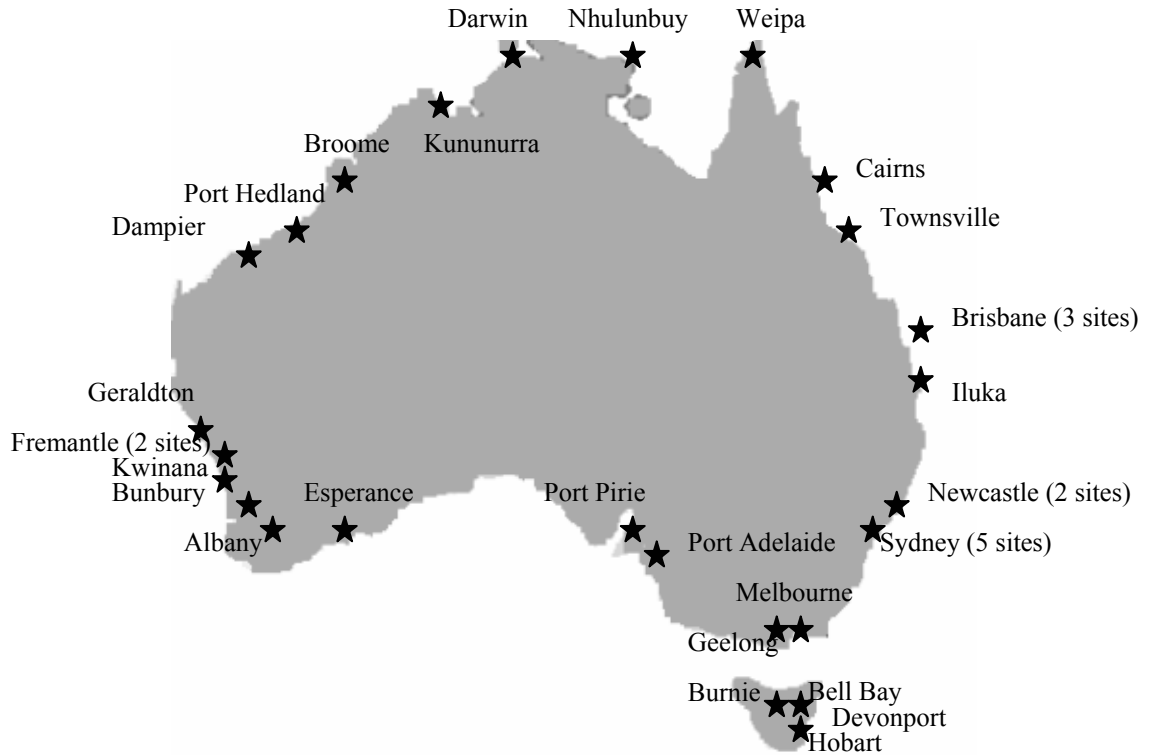
All states and territories of Australia have surveillance systems present to detect the presence of exotic bees and parasites, small hive beetle and bee louse: the *National Sentinel Hive Programme* which involves the inspection of sentinel hives in at least 27 seaports and log traps quarterly for varroa, tropilaelaps and tracheal mites, and *Apis cerana*, respectively²¹; and passive surveillance where beekeepers are required to notify the presence of notifiable diseases. In addition, there are AQIS inspections of vessels and cargo at ports upon arrival. The states and territories that have been recognised as free from small hive beetle and bee louse by Biosecurity New Zealand²² all have this pest listed as notifiable and beekeepers are required to report the presence of these pests or suspected presence of these pests either immediately, within 12 hours, or within 24 hours. Failure to report small hive beetle and bee louse in each of these states and territories carries strict

²¹ The absence of Asian honeybees, and varroa, tracheal, and tropilaelap mites are confirmed by log traps with pheromone lures in targeted locations, and the addition of acaricide strips in hives for 24-48 hours in conjunction with sticky boards placed on the bottom board of hives, respectively. Thirty to 50 adult bees are collected from each hive for internal examination. Specimens are then sent to the State or Territory Government Animal Health Laboratories or CSIRO (Black Mountain, Canberra). If pests are found in the sentinel hives, the *Australian Veterinary Emergency Plan (AUSVETPLAN for Bee diseases and pests (Version 3.0))* would be enacted. The sentinel hive and its colony shall be destroyed immediately and surveillance carried out within a 10 km radius.

²² Australian Capital Territory, Northern Territories, South Australia, Tasmania and Western Australia are recognised as free from small hive beetle. Australian Capital Territory, New South Wales, Northern Territories, Queensland, South Australia, Victoria, and Western Australia are recognised as free from bee louse. Reporting requirements for each state and territory are listed in table 1 of this review of submissions.

penalties including fines and imprisonment. Responses to bee louse outbreaks or suspected bee louse outbreaks are managed under the *Australian Veterinary Emergency Plan AUSVETPLAN*. Outbreaks or suspected outbreaks of small hive beetle are also managed under a national plan, the *National Small Hive Beetle Management Plan*²³.

Figure 1: Location of Australian Ports with Sentinel Hives



3.19 The Lorimer’s Honey submission suggests in its submission that the model veterinary certificate for bee products from Pacific Island countries should have details of the origin of the product making up the consignment in addition to the processing premises and registration number.

Biosecurity New Zealand response

Agreed. The model certificate will be amended accordingly prior to issue.

3.20 The Lorimer’s Honey submission notes that the number of Pacific Island countries has been extended to what had been previously allowed to export to New Zealand.

Biosecurity New Zealand response

There have been two import health standards for bee products operating for the last five years:

²³ The national plan to control the spread of small hive beetle and respond to outbreaks was endorsed by a SHB steering committee of Animal Health Australia and is available online at http://www.honeybee.org.au/SHB_FINAL_Mgt_Plan_AHA%2031-10-03_.pdf

- the import health standard for the importation of honey and propolis from Pitcairn Island, BEEHONIC.PIT, which covered products from Pitcairn Island; and
- the import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, which covered honey and propolis from Niue, Solomon Islands, Tonga, Tuvalu and Western Samoa.

The countries on the draft import health standard are the same as those in these two existing import health standards.

3.21 The Lorimer’s Honey submission questions the knowledge of bee diseases and risk management measures of official veterinarians who would sign export certificates for Pacific Island bee products and requests details of the Pacific Island surveillance programme to enable a declaration of area freedom and information about any audit procedures of certification.

Biosecurity New Zealand response

Over the next year, Biosecurity New Zealand officials will work with officials from the Ministry of Foreign Affairs and Trade (MFAT), Niue, Pitcairn Island, Samoa, Solomon Islands, Tonga and Tuvalu to develop an implementation plan to ensure that honey bee product imports can be managed under the recommendations of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

Biosecurity New Zealand will ensure that it has a high level of assurance that government officials from these countries can certify that the honey bee products meet the requirements stated in the draft import health standard for bee products from specified Pacific Island countries. No final import health standard will be issued for honey products from specified Pacific Island countries until the implementation plan is completed for each country.

The first step in the process of developing the implementation plan will be an assessment of each country’s honey bee health status. AgriQuality Ltd²⁴ assessed the honey bee health status of Niue and Samoa in preparation for the changes to New Zealand’s import health conditions.

A draft report on Samoa’s honey bee health status has been recently been completed and indicates that Samoa is still free from American foulbrood, European foulbrood, bee louse, small hive beetle, *Varroa* species mites and *Eugarroa* species mites²⁵. Biosecurity New Zealand is waiting on the results of a similar report on Niue’s honey bee health status, but is assured that Niue like Samoa has an enviably high honey bee health status. The honey

²⁴ The Government agency authorised by Biosecurity New Zealand under the *Biosecurity Act 1993* to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

²⁵ This report outlines a survey of 294 of Samoa’s beehives out of the national total of 467 hives and the survey was completed by AgriQuality Ltd. This report states that a *Bee and Bee Product Prohibition Order* was issued in 1999 under the *Customs Act 1977*. This report also provided a plan for the training of Samoan government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases.

bee health status of Pitcairn Island, Solomon Islands and Tuvalu will also need to be re-assessed in a similar manner as part of this implementation plan. The next step will be to ensure that the government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases and approve a system for auditing each countries surveillance programme.

4 Arataki Honey Ltd, Rotorua Division – Russell Berry

4.1 The Arataki Honey Ltd submission expresses strong concern that mutated H5N1 Avian Influenza will be imported in bee products. The argument is as follows:

- **Birds and bees have a natural close affiliation because birds and bees sip nectar and collect pollen from the same flowers, sometimes even at the same time, propolis is collected by bees, from trees where birds have perched for the night, and some birds even eat honey bees.**
- **Small farm holders in Asia are often involved in beekeeping and raising fowl resulting in contamination of brood, honey combs with avian nest debris and faecal material.**
- **The Bird Flu viruses are dynamic and are continually evolving, so it is difficult to establish the parameters of what is acceptable in the amount of Bird Flu H5N1 virus that is in the honey, because the virus is constantly changing.**
- **The importation of bee products into New Zealand should be banned now because it will be too late to establish controls once there are thousands of human deaths.**

The submission questions whether there has been a study on the quantity of the bird flu virus that is required to be eaten by humans from imported honey, to make them infected.

Biosecurity New Zealand response

Biosecurity New Zealand has assessed the likelihood of introduction of avian influenza virus into this country for a range of potential pathways over the past two years, and there is no information from any part of the world to support a conclusion other than the risk of introduction of avian influenza viruses in imported honey bee products is negligible. In addition, this issue was not considered in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004), and none of the submissions on the risk analysis suggested that avian influenza should be considered as a potential hazard in honey bee products.

4.2 The Arataki Honey Ltd submission notes that honey extraction is carried out with lower hygiene and food safety standards in other countries compared to those required in New Zealand and gives examples of Australian extraction plants with dirt floors using galvanized drums.

Biosecurity New Zealand response

Food safety is the responsibility of the New Zealand Food Safety Authority, not Biosecurity New Zealand. However, this statement has been addressed below.

The composition and labeling of honey in Australia and New Zealand is regulated under Parts 1 and 2 of the *Australia New Zealand Food Standards Code*²⁶. These standards include moisture and reducing sugar content and are the same for both countries. Part 3 of this code includes Australia-only standards that regulate honey extraction in Australia, and relate to premises and hygiene and require HACCP (Hazard Analysis and Critical Control Point)-based food safety programmes where appropriate. They are more up-to-date than New Zealand's domestic requirements under the *Food Hygiene Regulations 1974* and in many respects would be equivalent to those in place under the *Animal Products Act 1999* for New Zealand export-eligible bee products.

The standards are developed by Food Standards Australia and New Zealand (FSANZ), but are enforced by the states and territories of Australia. As in New Zealand, food standards have the force of the law in Australia. It is an offence in Australia to supply food that does not comply with relevant food standards, or sell food which is damaged, deteriorated or perished, which is adulterated, or which is unfit for human consumption.

If honey extraction plants were to operate with dirt floors and with galvanized drums in Australia, these plants would not meet the obligations under the code. If the submitter refers to standard 3.2.3 at http://www.foodstandards.gov.au/foodstandardscode/index.cfm#_FSCchapter3, which refers to the requirements of food premises and equipment, he will note that dirt floor and galvanized drums do not meet these requirements.

4.3 The Arataki Honey Ltd submission cites rumours that official government inspection of apiaries may involve checking Australian bee sites from the roadside rather than an inside hive inspection.

Biosecurity New Zealand response

A technical visit to Australia has given us evidence to quash these rumours. The requirement for bee products for annual inspection by a state or territory government apiary inspector in the import health standard is equivalent to New Zealand's own honey export requirements.

Discussions with Australian government officials and honey exporters indicate that Australia has chosen to implement the requirements more stringently than these clauses are implemented for New Zealand export product. Australian exporters have chosen to pay for this inspection to be done by government officials with extensive training in the differential diagnosis of bee diseases and are recognised as experts in their field. In

²⁶ The *Australia New Zealand Food Standards Code* was developed to ensure that there are uniform food standards operating in the different states of Australia and New Zealand. Information on this code is published online at http://www.foodstandards.gov.au/foodstandardscode/index.cfm#_FSCchapter3.

contrast, New Zealand exporters have decided that it is more cost effective to operate under Article 3.4.2.2 of the *OIE World Organisation of Animal Health Terrestrial Animal Health Code 2005*²⁷ which allows government authorities to use the assistance of bee keepers specially trained to qualify as ‘*health inspectors and advisers*’.

Any government officials decided to inspect an apiary from the roadside and then to certify that this inspection had occurred would be committing fraud. Biosecurity New Zealand cannot see why any official would commit such a fraudulent act and put the reputation of the Australian export industry, the Australian government and their own professional standing at risk.

4.4 The Arataki Honey Ltd submission comments on the lack of data on the level of European foulbrood spores in honey and the minimum infective dose of European foulbrood required to infect New Zealand hives.

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) acknowledges there is limited information on European foulbrood concentrations in honey, with only a single paper from Australia, Wootton et al (1981)²⁸ directly addressing this point. However, there is no reason to suppose that the bacterial levels are not typical of those found elsewhere. Wootton (1981) collected honey samples from a limited number of colonies infested with European foulbrood and tested the levels of European foulbrood in the honey. The maximum level recorded was 3.3×10^3 . Biosecurity New Zealand considers it has acted prudently in citing the maximum reported level in the risk analysis. A commercial consignment of honey would originate from a large number (likely to be hundreds, or even thousands) of hives. Other research suggests that many honey samples from areas with endemic European foulbrood will display no detectable sign of European foulbrood. Imposing measures designed to treat a bulk honey sample derived from multiple colonies a having higher levels of European foulbrood than the highest recorded level from a single colony would be difficult to defend.

Biosecurity New Zealand agrees that the concentration of bacteria required to start a new European foulbrood infection is unknown. A leading international researcher on this disease has suggested that determining this level would be exceptionally difficult, given the wide range of factors that would influence it. These include the number of bees in a colony, the relative proportions of bees of different ages, the availability of other food sources, and genetic variability among bee populations. While an infective dose level would be very useful to have, it is unknown to science, and there appears to be little prospect of it being measured in either the short or long term. Biosecurity New Zealand imposes biosecurity measures regarding many other diseases for which the infective dose is unknown.

²⁷ The OIE World Organisation for Animal Health is the international standard setting body for animal health. Information about the OIE and its terrestrial code (which covers honey bee pests and diseases) is available online at http://www.oie.int/eng/en_index.htm

²⁸ Wootton, M., Hornitzky, M. Ryland L.(1981) Thermal Destruction of Streptococcus-Pluton in Australian Honey and Its Effect on Honey Quality. *Journal of Apicultural Research*, **20**, 115-120.

Biosecurity New Zealand is obliged to make a decision based on the information that is available, rather than the information that is desirable. Biosecurity New Zealand has used all available information on the epidemiology of European foulbrood in order to reach its conclusions on the safety of honey treated to ensure a million-fold reduction of European foulbrood organism levels. A 6D (or million-fold) reduction in organism numbers means that 99.9999% of organisms have been inactivated, and for honey that initially contains the maximum level reported in the scientific literature, the final concentration would mean that a bee would have to consume on average 300 ml to encounter even a single European foulbrood organism. Notwithstanding the absence of precise scientific information on the infectious dose of European foulbrood, the available scientific information suggests that the likelihood of infection being introduced into a honey bee colony by such a low concentration of any pathogen is extremely remote. The 6D reduction is a standard principle used in human food safety assessment, and the bee products risk analysis has been reviewed by international experts in bee diseases and judged to be technically robust. The decision that the resulting honey can be considered to pose a negligible risk is not inconsistent with the level of protection (4D or 5D) achieved by international standards for heat treatment of milk products from countries or zones with foot and mouth disease.

4.5 The Arataki Honey Ltd submission asks why European foulbrood, small hive beetle (*Aethina tumida*), bee louse (*Braula coeca*) would be reported if they were detected in Australian states which are currently free of these pests and diseases.

Biosecurity New Zealand response

As part of its international obligations as a member of the OIE World Organisation for Animal Health, Australia is required to notify the presence of American foulbrood and small hive beetle. In addition, American foulbrood, bee louse (*Braula coeca*), European foulbrood, and small hive beetle (*Aethina tumida*) are subject to regional disease reporting under State or territory and Australian government legislation. Reporting requirements for European foulbrood, bee louse and small hive beetle in the different states and territories are listed in Table 1:

Table 1: Reporting Requirements for Notifiable Honey Bee Diseases in Australia

State or Territory	Legislation²⁹	Reporting requirements for European foulbrood, bee louse and small hive beetle	
Australian Capital Territory	<i>Animal Diseases Act 2005</i>	European foulbrood Bee louse Small hive beetle	Immediate
Queensland	<i>Stock Regulation 1988 (Stock Act 1915)</i>	Bee louse	Immediate

²⁹ Information about Australian legislation is available online at <http://www.austlii.edu.au/>

	<i>Apiaries Act 1982</i>	Small hive beetle	48 hours
New South Wales	<i>Stock Diseases Act 1923</i>	European foulbrood Small hive beetle	48 hours
	<i>Exotic Diseases of Animals Act 1991</i>	Bee louse	Immediate
Northern Territories	<i>Stock Diseases Act</i>	European foulbrood Bee louse Small hive beetle	Immediate
South Australia	<i>Livestock Act 1997</i>	European foulbrood Bee louse Small hive beetle	12 hours
Tasmania	<i>Animal Health Act 1995</i>	European foulbrood Small hive beetle	Immediate
Victoria	<i>Livestock Disease Control Act 1994</i>	European foulbrood	7 days
		Bee louse Small hive beetle	12 hours
Western Australia	<i>Exotic Diseases of Animals Act 1993</i> <i>Stock Disease (Regulations) Act 1968</i> <i>Beekeepers Act 1963</i>	European foulbrood Bee louse Small hive beetle	24 hours

Failure to report a notifiable disease in each of these states and territories carries strict penalties including fines and imprisonment.

4.6 The Arataki Honey Ltd submission states that the 12 month inspection for American foulbrood is irrelevant because the disease status can change in 12 months.

Biosecurity New Zealand response

The risk management measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) are designed to ensure that the level of spores in imported honey is not significantly greater than that in New Zealand produced honey, in order to be compliant with the *World Trade Organisation Sanitary and Phytosanitary Agreement*³⁰.

Certification that the honey was not derived from hives known or suspected to be clinically affected by American foulbrood on an annual inspection is considered to provide a level of protection that is broadly equivalent to that achieved by the New Zealand American Foulbrood National Pest Management Strategy.

American foulbrood is an endemic disease in New Zealand, and the New Zealand American Foulbrood National Pest Management Strategy legislated through the

³⁰ Information about the *World Trade Organisation Sanitary and Phytosanitary Agreement* is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>

*Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*³¹ is focused on transmission from hive to hive rather than transmission through commercially packed honey. This is reflected in the absence of any requirement in the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* for beekeepers to check the American foulbrood status of hives at the time of honey harvesting, or for commercially traded honey to contain less than a minimum level of spores.

4.7 The Arataki Honey Ltd submission questions why irradiation is listed as a treatment option in the draft import health standard when it is illegal to sell irradiated foodstuffs in New Zealand which are not labelled as such.

Biosecurity New Zealand response

Although irradiation is considered to address biosecurity concerns in imported bee products, permitting irradiated food to be imported into New Zealand or not is a food safety issue, and therefore the responsibility of New Zealand Food Safety Authority.

However, Biosecurity New Zealand is aware that the irradiation of food is subject to the *Australia New Zealand Food Standards Code. Standard 1.5.3 Irradiation of Food* which prohibits irradiation of food unless specific permission is given. The draft import health standards have two clauses to inform importers that there may be additional regulations relating to food safety. The first clause is clause 2.1 which states that:

Commercial consignments of products imported into New Zealand for human consumption must comply with the Food Act 1981. These requirements are independent of the import health standard requirements and are managed by the New Zealand Food Safety Authority (NZFSA). Importers are advised to consult the NZFSA website: www.nzfsa.govt.nz/imported-food/index.htm or contact the NZFSA.

The second clause is note 4 following clause 7.3 which states that:

Irradiated foods intended for human consumption are not eligible for import into New Zealand unless they have been through a pre-market safety assessment process conducted by the Food Safety Association of New Zealand. Further information is available from the New Zealand Food Safety Authority website at <http://www.nzfsa.govt.nz/consumers/food-safety-topics/food-processing-labelling/food-irradiation/index.htm>.

This note explains the need for a pre-market safety assessment and if importers look at the website link they will see that bee products are not listed as one of the irradiated foods eligible for import into New Zealand. Honey bee products incorporated into medicines and nutraceuticals, such as pollen capsules, are not defined as foods and may be eligible for import. Importers should contact the New Zealand Food Safety Authority NZFSA to check the eligibility status of any bee products as this status may change.

³¹ The *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* is available online at <http://www.knowledge-basket.co.nz/regs/regs/text/1998/1998260.txt>

- 4.8 The Arataki Honey Ltd submission notes that if comb honey is heated to 50°C for 24 hours it will no longer be comb honey as 43 °C is the maximum temperature that can be applied to this product before the wax breaks down.**

Biosecurity New Zealand response

Agreed. One of the reasons why draft import health standards are put out for public consultation is to check their practicality. While the proposed heat treatment was appropriate from a biosecurity perspective, it will be removed as an option in the import health standard when it is issued as it is not practical for the reasons cited in this submission.

- 4.9 The Arataki Honey Ltd submission questions whether freezing at -18°C for 7 days will kill all hitchhiker pests and notes that it would not kill all American foulbrood or European foulbrood.**

Biosecurity New Zealand response

The term ‘hitch-hiker’ is used by Biosecurity New Zealand to describe insects, ticks and spiders that may be inadvertently introduced on products. The measures are in addition to any measures for American foulbrood and European foulbrood. The freezing regime specified in the import health standard is that which is routinely used by Biosecurity New Zealand to kill insects, ticks and spiders on fresh produce. It is reasonable to conclude that freezing will also kill insects, ticks and spiders on raw propolis or pollen.

- 4.10 The Arataki Honey Ltd submission expresses concerns that imported Australian honey may be mixed with imported Chinese honey and that some of that Chinese honey may be sugar-contaminated “honey” rather than true honey. The submission also expresses concerns that imported honey might be contaminated with drugs as both Australia and China use drugs to control bee diseases.**

Biosecurity New Zealand response

The certification requirements stated in the import health standard for bee products from Australia mean that honey cannot be certified as Australian product if it is imported from a third country. It must originate from hives in Australia that have been inspected in the past 12 months.

Regarding drug residues in Australian honey, the *Australian National Residue Survey Programme*³² has been monitoring for the following antibiotic residues in honey since 2002. As Table 2 of this review of submissions indicates no antibiotics have been detected in the past three years in national Australian honey samples.

³² As recommended in *Codex Alimentarius* guidelines, Australia operates a statistical risk-based approach to residue monitoring. Stratified random samples are taken focusing on high-risk producers or areas. Collection of samples at the producer or packer level is approved by state government apiary officers, so that these officers can trace back and investigate any positive samples. This *National Residue Survey Programme* is operated by the Australian Department of Agriculture Fisheries and Forestry. The results of the *National Residue Survey Annual Report* are available online at <http://www.daff.gov.au/content/output.cfm?ObjectID=715E69E1-5C4B-4439-84A2091FE098AD6D>.

Table 2: Results of the Australian National Residue Survey Programme
(1 July 2002 to 30 June 2005)

ANTIBIOTIC	RESIDUES FOUND IN NATIONAL HONEY SAMPLES					
	01/07/2002 – 30/06/2003		01/07/2003- 30/06/2004		01/07/2004 – 30/07/2005	
	No. of samples	No. of residues	No. of samples	No. of residues	No. of samples	No. of residues
Dihydrostreptomycin	61	0	60	0	72	0
Neomycin	61	0	60	0	72	0
Streptomycin	61	0	60	0	72	0
Sulfadiazine	61	0	60	0	72	0
Sulfadimidine	61	0	60	0	72	0
Sulfmerazine	61	0	60	0	72	0
Chlortetracycline	61	0	60	0	72	0
Oxytetracycline ³³	61	0	60	0	72	0

4.11 The Arataki Honey Ltd submission questions the level of protection provided in the draft import health standard for bee products from specified Pacific Island countries because import controls on bee products for these countries may be less than the import controls present in New Zealand.

Biosecurity New Zealand response

The intention of the draft import health standard for the importation of bee products from specified Pacific Island countries is to update existing trade conditions so the measures match those recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

Prior to the development of the new draft import health standards, the Biosecurity Authority³⁴, considered information about the import controls present in these countries. This information was then updated regularly by AgriQuality Ltd³⁵ apiary officers who visited these countries for routine surveys of their legislation, border controls, and honey bee health. This information will be reassessed before a final import health standard is issued and ensure that these countries can meet the recommendation of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

³³ Australia has recently approved a temporary MRL of 0.3 ppm for only one antibiotic Oxytetracycline (OTC). This was due to an increased sensitivity levels in analytical methods. There are no MRLs for any other antibiotics.

³⁴ The section of MAF which gave approval for the original import requests from these countries prior to the establishment of MAF Biosecurity New Zealand.

³⁵ The Government agency authorised by Biosecurity New Zealand under the Biosecurity Act 1993 to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

Nonetheless, previous information shows that these countries have much tighter import controls for bee products than New Zealand's own import controls. These countries have legislation prohibiting the import of bees and all bee products. In contrast, New Zealand currently imports honey and propolis from specified Pacific Island countries and a range of processed bee products and other products containing bee products as minor ingredients from around the world.

4.12 The Arataki Honey Ltd submission queries the use of the words “*have never been reported in this country*” as this statement does not say that the pest is not present in the country.

Biosecurity New Zealand response

Part D of the draft import health standards contains documents that are approved to accompany imports of the bee products listed in the import health standard. These documents are model veterinary certificates. Prior to any importation, each exporting country will develop their own export certification using these model certificates.

The phrases “*has never been reported*” and “*has never been reported*” are used for exporting countries in which Biosecurity New Zealand has assessed the country health situation and determined disease freedom, and where these diseases are notifiable. For diseases where this health status may change, Biosecurity New Zealand uses these phrases so that we can be notified of any changes. The phrases are not used for any diseases that have not had a freedom case recognised by Biosecurity New Zealand or for any diseases that are not notifiable in the exporting country. The certificate only needs to have the information that might change. In this case, this is whether the disease has been reported in the exporting country.

4.13 The Arataki Honey Ltd submission claims that clause 1.1 of the draft import health standard for bee products from specified Pacific Island countries does not list all of the pests that could be carried on these products that are of concern to New Zealand.

Clause 1.1 of the draft import health standard for bee products from specified Pacific Island countries specifies all of the diseases listed as hazards that are considered to be potentially capable of introduction in any bee products. Clause 2.1 of the draft import health standard for bee products from specified Pacific Island countries refers to the only other pests listed as hazards in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004), *Varroa destructor* and other varroa species mites, but this clause is only pertinent for comb honey and pollen, not all bee products.

5 Central South Island Ward of the National Beekeepers Association

5.1 The Central South Island Ward of the National Beekeepers Association submission states their members' concern about unwanted organisms being imported with bee products, and that these organisms may have a detrimental effect the health of our beehives, sustainable beekeeping and wider agricultural community.

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) considered the risk of introduction of the organisms that were considered potentially able to be introduced in imports of honey bee products, and recommended risk management measures for those organisms for which the risk was considered to be non-negligible. The draft import health standards are based on the recommendations of that risk analysis.

- 5.2 The Central South Island Ward of the National Beekeepers Association submission states that the Import Risk Analysis for Honey Bee Products and the Review of Submissions does not meet the requirements under the Biosecurity Act 1993 whereby the chief technical officer must have regard to.. ‘the nature and possible effect on people, the New Zealand environment, and the New Zealand economy of any organisms that goods of the kind or description specified in the import health standard may bring to New Zealand’ as Biosecurity New Zealand responses to submissions about risks to the NZ environment and the NZ economy were that these issues were beyond the scope of the risk analysis.**

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) and review of submissions have been conducted according to standard risk analysis procedures and processes, and both documents were signed off by the Chief Technical Officer of the Pre Clearance Directorate of Biosecurity New Zealand, thereby meeting the requirements of section 22 of the *Biosecurity Act 1993*³⁶.

- 5.3 The Central South Island Ward of the National Beekeepers Association submission questions why Biosecurity New Zealand in the review of submissions stated that “Many submitters raised issues that were beyond the scope of the RA, such as the economic effects of imports on the local beekeeping industry”, and asks why the scope was limited to cover only the local beekeeping industry listing the greater benefit of pollination services.**

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) did consider the consequences of introduction of every organism that was considered to be a potential hazard in the commodities. Among the consequences considered explicitly was the effect on pollination services, especially to the pip fruit industry.

The *Sanitary and Phytosanitary Agreement*³⁷ does not permit member countries of the World Trade Organisation to include consideration of economic competition from cheaper foreign honey. This was, therefore, excluded from the consequence assessments.

³⁶ The *Biosecurity Act 1993* is available online at http://www.legislation.govt.nz/libraries/contents/om_isapi.dll?clientID=203846&infobase=pal_statutes.nfo&jump=a1993-095&softpage=DOC&wordsaroundhits=6

³⁷ Information about the *World Trade Organisation Sanitary and Phytosanitary Agreement* is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>

- 5.4 The Central South Island Ward of the National Beekeepers Association submission asserts that Biosecurity New Zealand have hidden behind a “scientific approach” as per the Sanitary and Phytosanitary Agreement (SPS) without giving regard to either the New Zealand environment nor the New Zealand economy.**

Biosecurity New Zealand response

Impacts of diseases on the environment and economy were discussed in the consequence assessments for each organism considered to be a potential hazard. However, the *World Trade Organisation Sanitary and Phytosanitary Agreement* requires risk assessments to be based on science.

- 5.5 The Central South Island Ward of the National Beekeepers Association submission questions why the three import health standards have different standards for different countries and why the standards refer to different commodities. The submission questions why the import health standard for Australian honey is the most liberal despite the members’ belief that this is the commodity posing the most immediate biosecurity threat.**

Biosecurity New Zealand response

The three import health standards have different conditions because they cover the importation of dissimilar bee products from countries with differing health statuses:

- The import health standard for specified bee products from all countries, BEEPROIC.ALL, includes all of bee products that are either unattractive to bees, or processed so that they are unlikely to contain infective material, and do not require any zoosanitary certification.
- The other two import health standards include bee products that need zoosanitary certification stating that the country is free, or that apiaries have been inspected and are free, or that the products have been heat treated to manage the risk from specific diseases.

Biosecurity New Zealand is unsure what measures or threat the submission is referring to when it refers to the measures being the most liberal for Australian honey when this is the commodity posing the most immediate threat.

If the submission is referring to European foulbrood, Biosecurity New Zealand acknowledges that Western Australia is as free from European foulbrood as Niue, Pitcairn Island, Samoa, the Solomon Islands, Tonga, Tuvalu or New Zealand itself. If the submission is referring to American foulbrood, both standards have apiary inspection as an option. BEEPROIC.AUS also has irradiation and spore counting because Australia has approved methods of implementing these measures. Like apiary inspection, these measures provide at least the acceptable level of protection determined by Biosecurity New Zealand from this disease.

5.6 The Central South Island Ward of the National Beekeepers Association submission asks why there is an inconsistency between the risk management measures for European foulbrood and American foulbrood stated in the import health standard for bee products from Australia and what is required domestically.

The submission notes the following differences:

- **New Zealand honey exporters are required under the Animal Product Act 1999 to have a Risk Management Program (RMP), Good Manufacturing Practice (GMP);**
- **New Zealand beekeepers have a Pest Management Strategy (PMS) for American foulbrood which specifically prohibits the use of antibiotics to treat or mask the symptoms of American foulbrood. In comparison the import health standard requires hives are to be inspected and found not to be clinically infected or suspected to be clinically infected with *Paenibacillus larvae larvae*, but does not state that the hives have not been treated with antibiotics prior to the inspection date, which would mask the clinical symptoms of American foulbrood;**
- **Australia imports honey.**
- **Australian honey may be contaminated with antibiotic residues, be blended with imported honey, contaminated with imported resistant American foulbrood strains, and imported European foulbrood.**

Biosecurity New Zealand response

The sanitary measures considered necessary to manage the risk of introduction of European foulbrood and American foulbrood to an acceptable level are listed in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004), and these form the basis for the import health standards.

5.7 The Central South Island Ward of the National Beekeepers Association submission expresses concerns that there has not been sampling to establish a “base line American foulbrood spore loading for NZ honey” which would indicate whether the levels increase due to importation of honey and bee products.

Biosecurity New Zealand response

Any sanitary measures imposed upon imported honey must be equivalent to that imposed on domestic honey. The National Beekeepers Association is responsible for any restrictions on domestic honey through their management of the National American Foulbrood Pest Management Strategy legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*³⁸. Spore counting is not used under the New Zealand American Foulbrood National Pest Management Strategy for

³⁸ The *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* is available online at <http://www.knowledge-basket.co.nz/regs/regs/text/1998/1998260.txt>

disease control decisions at the individual hive level, as retail honey is not identified is a significant cause of American foulbrood spread in this strategy.

- 5.8 The Central South Island Ward of the National Beekeepers Association submission asks why Australia does not have controls which would prevent further importation of European foulbrood and how Western Australia can give an assurance that imported honey, or honey from eastern Australia, is treated to exclude European foulbrood thus maintaining their European foulbrood freedom claims.**

Biosecurity New Zealand response

Under the *Sanitary and Phytosanitary Agreement* of the World Trade Organisation, Australia cannot impose national controls for an endemic disease like European foulbrood apart from areas or territories that can demonstrate freedom from this disease.

Western Australia does have controls that have kept the state free from European foulbrood. Since 1977, Western Australia has had legislation and border controls in place to prevent the importation of bees, bee products and beekeeping equipment which could carry European foulbrood. While Commonwealth Laws allow the importation of honey and some hive products into Australia from other countries, these products cannot be imported into Western Australia because this is prohibited by state legislation, the *Beekeepers Act 1963* which overrides the Commonwealth laws.

Pasteurised honey³⁹, refined beeswax and royal jelly may enter Western Australia subject to risk assessment, health certification and, where appropriate, laboratory testing. Foods or health products containing honey, pollen, royal jelly, propolis and other hive products are restricted and subject to risk assessment prior to entry to Western Australia. Unpasteurised honey, honeycomb, unprocessed beeswax, pollen, bees, used hive equipment, used beekeeping appliances, queen bees, queen cells, packages (live bees in a wooden box), or other hive products are prohibited entry into Western Australia.

Signs alerting travelers that honey and associated products can not be brought into Western Australia are in place at domestic and international airports. Detector dogs are trained to find bees, honey and other hive products at all Western Australian entry points. Dogs and x-ray machines are also used to detect illegal imports at all post offices that receive overseas or interstate mail. Since the ban on imports of live bees, honey products and equipment was introduced in 1977, none of these items have been detected entering the state by post.

- 5.9 The Central South Island Ward of the National Beekeepers Association submission suggests that as honey and pollen are the natural feed sources of bees, it should be assumed that the imported bee products are suitable to be used by beekeepers as “feed” for bees.**

Biosecurity New Zealand response

³⁹ Western Australia refers to pasteurisation as being a process that heats honey to a core temperature of 65°C for at least 8 hours.

This was assumed in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

5.10 The Central South Island Ward of the National Beekeepers Association submission asks what actions of redress will be available if products are shown to be responsible for the introduction of a disease which we do not have in New Zealand, or a disease which is under legal control (American foulbrood).

Biosecurity New Zealand response

Regardless of the route of introduction, any exotic disease incursion into New Zealand will be managed by Biosecurity New Zealand according to the following established policies.

- The *MAF Biosecurity Authority Policy Statement on Responding to an Exotic Organism Incursion* (2001)⁴⁰ covers Biosecurity Ministries⁴¹ generic response principles for exotic diseases and pests affecting animals, plants and forestry.
- *MAF Biosecurity Authority Standard 153: Exotic Disease Programmes of Animals (including honey bees and fish)* (2004)⁴² specifies the outcomes required during an investigation and initial response phase for suspected cases of exotic diseases of animals.

When powers under the Biosecurity Act 1993 are exercised for the purpose of managing or eradicating a disease as part of an exotic disease response and this causes verifiable loss, compensation may be granted.

American foulbrood, which is an endemic disease, is managed National American Foulbrood Pest Management Strategy legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*. Therefore, it is not covered by exotic disease response policies.

5.11 The Central South Island Ward of the National Beekeepers Association submission expresses concern that the risk analysis did not consider many aspects of importation of bee products and did not consider that bee diseases have spread (and continue to be spread) world wide where a trade in bees and bee products is undertaken (even with controls).

Biosecurity New Zealand response

⁴⁰ The *MAF Biosecurity Authority Policy Statement on Responding to an Exotic Organism Incursion August 2001* is available online at <http://www.biosecurity.govt.nz/bio-strategy/library/policy-incursion.htm>

⁴¹ MAF, Ministry of Fisheries, Department of Conservation and Ministry of Health

⁴² *MAF Biosecurity Authority Standard 153: Exotic Disease Programmes of Animals (including honey bees and fish) October 2004* is available online at <http://www.maf.govt.nz/biosecurity/pests-diseases/animals/exotic-disease-response.htm>

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) considered the existing scientific information on bee diseases, as Biosecurity New Zealand is obliged to do under the *World Trade Organisation Sanitary and Phytosanitary Agreement* and section 22 of the *Biosecurity Act 1993*⁴³.

5.12 The Central South Island Ward of the National Beekeepers Association submission state that there is no surveillance program for NZ beehives conducted by personnel experienced in overseas diseases and notes that MAF Biosecurity has given no assurances that an unwanted organism can be identified in a NZ beehive in a time frame which would assist in an eradication attempt.

Biosecurity New Zealand response

Biosecurity New Zealand has operated an active surveillance programme for exotic diseases, pests and undesirable genetic strains of honey bees for a significant number of years. During the period May 2001 - May 2002 the Bee Disease Surveillance Standard Technical Review Committee made up of Biosecurity Authority⁴⁴ officials and representatives of the National Beekeepers' Association developed the current active surveillance programme that consists of:

- hive inspection and sampling for nominated exotic diseases, pests and undesirable genetic strains of honey bees (including high risk area⁴⁵ inspection and sampling, sampling of adult bees from export apiaries⁴⁶; and investigation of suspected exotic honey bee diseases);
- maintenance of records of beekeepers, apiaries, hives and bee diseases in an apiary database;
- management of exotic disease inquiries from beekeepers reporting suspected exotic diseases or unusual symptoms in hives, including further investigation when warranted; and
- reporting on activities and findings in *'The New Zealand Beekeeper'* and Biosecurity New Zealand's *'Surveillance'* magazines.

Since the 2004 season (July 04 - June 05), Biosecurity New Zealand has used AgriQuality Ltd⁴⁷ apiary inspectors authorised under the Biosecurity Act 1993 and trained in exotic

⁴³ The *Biosecurity Act 1993* is available online at http://www.legislation.govt.nz/libraries/contents/om_isapi.dll?clientID=203846&infobase=pal_statutes.nfo&jump=a1993-095&softpage=DOC&wordsaroundhits=6

⁴⁴ The section of MAF responsible for this biosecurity prior to the establishment of Biosecurity New Zealand in 2004.

⁴⁵ Throughout New Zealand 23 geographic areas, 13 in the North Island and 10 in the South Island, have been classified as being high risk because they have the greatest potential for entry of exotic honey bee diseases and pests. They include seaports, airports, major cities and tourist destinations.

⁴⁶ All apiaries that supply live bees or queens for export have a composite bee sample taken and tested.

⁴⁷ The Government agency authorised by Biosecurity New Zealand under the Biosecurity Act 1993 to oversee honey bee surveillance and export certification of live bees, bee genetic material and bee products.

disease recognition and sampling techniques to complete the inspection and sampling component of the honey bee active surveillance programme.

This was a change from the previously agreed system where samples were collected by trained beekeepers rather than by AgriQuality Ltd apiary inspectors, which was based on a decision by the Disease Surveillance Standard Technical Review Committee in 2002 who believed use of trained beekeepers was more cost effective. However, surveillance targets were not met when beekeepers were requested to inspect and sample their own hives using the sample kits provided.

Biosecurity New Zealand began a review of the technical components and funding arrangements, for delivery of the *MAF Standard for Surveillance of Diseases of Honey Bees*⁴⁸ in August 2003, in response to the release of the *Biosecurity Strategy for New Zealand, Protect New Zealand*⁴⁹. To begin the review process a technical working party, comprised of apiculture disease experts from independent organisations and AgriQuality Ltd, plus Biosecurity Authority officials, was convened to develop a series of technical options, with costings, for future implementation. The results from that review were presented to the Annual National Beekeepers Association Conference in June 2004. This review showed that the current surveillance programme requires considerable upsizing if it is going to be successful in timely detection of an exotic disease incursion. The consultation process has not been finalised, but is intended to be completed during the 06/07 financial year.

- 5.13 The Central South Island Ward of the National Beekeepers Association submission suggests that as honey and pollen are the natural feed sources of bees, it should be assumed that the imported bee products are suitable to be used by beekeepers as “feed” for bees. The submission included a photograph showing how imported honey may find its way into a NZ beehive; honey was smeared on the inside of a container and exposed it to the environment. The photo shows that bees were attracted to the container.**

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) acknowledged that honey is attractive to bees and could be fed to bees. It commissioned research from HortResearch to determine what percentage of honey in sugar water was attractive to bees. Biosecurity New Zealand have assumed, therefore, that imported honey is attractive to bees and that there is a possibility that bees will be exposed to any hazards present in it.

6 Comvita New Zealand Limited

⁴⁸ The *MAF Standard for Surveillance of Diseases of Honey Bees* is available online at <http://www.biosecurity.govt.nz/pests-diseases/animals/standards/bee-disease-surveillance.htm>

⁴⁹ The *Biosecurity Strategy, Protect New Zealand* is available online at <http://www.biosecurity.govt.nz/bio-strategy>

- 6.1 The Comvita New Zealand Ltd submission provided information about their importation of royal jelly powder in a slurry. This included the reasons why Comvita New Zealand Ltd imports royal jelly into New Zealand, a HortResearch Ltd research report that concluded that honey bees are not attracted to royal jelly when in the slurry form, how processing is done in a registered transitional facility that works under strict pharmaceutical GMP standards and Biosecurity New Zealand animal product standards.**

Biosecurity New Zealand response

Biosecurity New Zealand is confident with the information provided that the biosecurity risks associated with the importation and further processing of royal jelly slurry into capsules for human consumption are being effectively managed. Biosecurity New Zealand also understands that the demand for royal jelly cannot be met through domestic product or by exports from Australia or the Pacific Islands using the import conditions proposed in the draft import health standards, and that processing the royal jelly capsules in New Zealand allows Comvita New Zealand Ltd to exercise a high level of control over processing and specifications.

As the percentage of royal jelly in the slurry is less than 50%, when the import health standard for specified bee products from all countries is issued this product will be assessed as a composite product and may be re-issued a permit so that it can continue to be processed in a transitional facility when the current permit expires.

7 MA Pollard

- 7.1 MA Pollard questions the Biosecurity New Zealand methodology for making equivalence decisions and suggests that expected utility analysis and Bayesian probability theory would be more practical methods than those currently used by Biosecurity New Zealand.**

Biosecurity New Zealand response

Risk analyses could not use Bayesian probability theory and expected utility analysis without considering the expected economic benefits arising from the trade itself. This approach is not possible under the *World Trade Organisation Sanitary and Phytosanitary Agreement*⁵⁰, where benefits from trade are assumed and only the risks arising from organisms associated with the traded commodities may be considered. This requirement is closely reflected in the wording of section 22 of the *Biosecurity Act 1993*⁵¹, which is the

⁵⁰ Information about the *World Trade Organisation Sanitary and Phytosanitary Agreement* is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>.

⁵¹ The *Biosecurity Act 1993* is available online at http://www.legislation.govt.nz/libraries/contents/om_isapi.dll?clientID=203846&infobase=pal_statutes.nfo&jump=a1993-095%2fs.103&softpage=DOC&wordsaroundhits=6#JUMPDEST_a1993-095/s.103

domestic legislation underlying the development of risk analyses and import health standards.

- 7.2 MA Pollard asks why products with less than 2% honey are exempted from any sanitary measures. He suggests that composite products with less than 2% of bee products should have a manufacturer’s declaration that states that this material has been so treated that the probability of the material containing things pathogenic to bees is negligible.**

Biosecurity New Zealand response

Biosecurity New Zealand commissioned HortResearch to investigate the lowest concentration of honey or sugar water that would be attractive to bees. The study tested trained bees on several honeys as well as honey dew, sucrose, glucose, fructose and maltose. While bees were attracted to some of the honeys only at higher percentages, it was found that the lowest concentration of the most attractive honeys in the study was 2%.

Biosecurity New Zealand decided that this level would be feasible, and that that many of the processed products are packaged and processed so that they pose very low risk. Asking importers to submit a manufacturer’s declaration that ‘*this material has been so treated that the probability of the material containing things pathogenic to bees is negligible*’ is not acceptable, as this would allow manufacturers to determine what is meant by the term “negligible” rather than having this determination made by Biosecurity New Zealand as part of a case-by-case risk assessment.

- 7.3 MA Pollard questions the decision made to encapsulate bee products as the risk analysis does not discuss whether encapsulation increases or decreases the probability of bees becoming infected with honey bee pathogens. He suggests that encapsulated bee products should have a manufacturer’s declaration that states that this material has been so treated that the probability of the material containing things pathogenic to bees is negligible.**

Biosecurity New Zealand response

Section 2.2.7 of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) discusses capsules of pollen and royal jelly, and states that these forms of the commodity are not considered to be attractive to bees.

- 7.4 MA Pollard questions the decision to allow baking as an option as honey could be used as a glaze on these products. He recommends that cakes and bread should be removed from the list of baked items with no measures.**

Biosecurity New Zealand response

Biosecurity New Zealand considers this to be a negligible risk.

- 7.5 During the consultation period for the risk analysis, MA Pollard requested the raw data used to make decisions about European foulbrood. This data was sent to him, and he carried out his own analysis. Following that analysis, MA Pollard queried some statistical details and suggested that there should be more information about**

models based on Ordinary Least Squares (OLS) so that a reasonable judgement of the model can be made. He suggested that the risk analysis should have included the original data set, analysis of residuals, any outliers and the error term, results of tests for multicollinearity, autocorrelation, and heteroskedasticity.

Biosecurity New Zealand response

Biosecurity New Zealand met with MA Pollard and discussed the statistical analyses used by Cox and Domijan. MA Pollard verbally expressed his satisfaction that the analytical approach used in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) is valid.

7.6 MA Pollard suggests that the import health standards should have a definition of country of origin.

Biosecurity New Zealand response

Agreed. The following definition will be added to the eligibility section of the import health standard for the importation of bee products from Australia, BEEPROIC.AUS and import health standard for the importation of bee products from specified Pacific Island countries, BEEPROIC.PAC before they are issued.

The country of origin is the country in which the apiaries of the honey bees that produced the bee product were situated during the season of production (i.e. season of beeswax production, honey production, pollen production, propolis production or royal jelly production).

7.7 MA Pollard asks that clause 1.1 of the veterinary certificate for products from Australia be changed from: *Originate from apiaries in Western Australia and M. pluton has not been reported in this state; to: Originate from hives that have been in Western Australia and no other state for the last year or more, and M. pluton has not been reported in Western Australia and that none of the bee products have been mixed with bee products from other states.*

Biosecurity New Zealand response

By signing that the products originate in Western Australia, the official signing officials are signing that the products have not been mixed with products that have been imported from other states and territories of Australia. Amending this clause is not necessary.

7.8 MA Pollard asks for clause 1.1 of the veterinary certificate for products from Pacific Island countries to include the phrase *and that none of the bee products have been mixed with bee products from other states.*

Biosecurity New Zealand response

The Pacific Island countries specified in the draft import health standard do not import honey so will not be able to mix domestically produced honey with imported honey.

- 7.9 MA Pollard queries why options of heat and irradiation are not offered as options for Pacific Island countries so that these options could be there if these countries have an incursion in the future.**

Biosecurity New Zealand response

The Pacific Island countries specified in the draft import health standard do not have facilities to treat bee products by heating or irradiation. Therefore, if European foulbrood is reported in these countries and freedom no longer applies, no bee products will be eligible for import.

- 7.10 MA Pollard asks in his submission whether the freezing temperature is low enough for pollen as powdered materials are poor conductors of heat.**

Biosecurity New Zealand response

Biosecurity New Zealand considers that freezing will adequately manage the risk in pollen. None of the internal or external technical reviewers of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) advised otherwise.

8 National Beekeepers Association, NBA

- 8.1 The National Beekeepers Association submission dated 20 February 2006 seeks assurances that import health standards will be drafted on a case-by-case basis. The submission argues that import permits issued under the draft import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, should not be valid for up to 12 months and the disease status of any country could change within this period. The submission suggests that permits should only be valid for up to 2 months.**

Biosecurity New Zealand response

When the import health standard for specified bee products from all countries is issued, permits rather than import health standards will be used for composite products that have been assessed on a case-by-case basis as posing a negligible risk because of the way they are processed and packaged. Permits will not be issued for composite products that require veterinary certification stating that the country is free from a disease⁵². Therefore, as the permits are not reliant on disease information they can be issued for a 12 month period.

- 8.2 The National Beekeepers Association submission dated 20 February 2006 asks that the 2% level for composite products should specify the total sugar content including honey and added sugars; as any greater content significantly increases the attractiveness to bees.**

Biosecurity New Zealand response

⁵² Note: If importers are interested in importing products which do not pose a negligible risk and require such certification, they will need to apply for an import health standard to be developed.

When the import health standard for specified bee products from all countries is issued, importers will be required to send information about processed composite products containing 2-50% honey to Biosecurity New Zealand for an assessment. The types of processed products which contain honey are usually heat treated to levels that exceed those in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). Biosecurity New Zealand will consider the sugar content of the composite products when an assessment is made. These products include cough syrups, tea flavourings, marinades, alcoholic drinks, fruit beverages, baked items, cosmetics as described in the definition of composite products in the draft import health standard for the importation of specified bee products from all countries.

- 8.3 The National Beekeepers Association submission dated 20 February 2006 states that there needs to be consistent use of the safeguard determined in the risk analysis for heat treatment of bee products as one option for managing the risk from *Paenibacillus larvae larvae*. The submission suggests that this has been applied in clause 1.2.3 of the import health standard for specified bee products from Australia, but should be included in all import health standards for bee products from other countries.**

Biosecurity New Zealand response

The National Beekeepers Association submission is presumably referring to consistent use of the heat treatment option for American foulbrood.

Heat treatment to manage American foulbrood (120°C for at least 24 hours) is not listed as an option in the import health standard for bee products from Pacific Island countries, BEEPROIC.PAC, for two reasons:

- these Pacific Island countries export a narrow range of pure bee products which cannot be heated to such an extent. They do not export the same types of product as Australia where honey or pollen are added to other products which may be able to be heated.
- annual inspection of American foulbrood is critical to maintain information about the disease status of these Pacific Island countries.

Heat treatment to manage American foulbrood (120°C for at least 24 hours) is not included in the draft import health standard for specified products from all countries, BEEPROIC.ALL, because this draft import health standard does not include honey, pollen, royal jelly, raw beeswax and foundation beeswax. Note that in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) sanitary measures for American foulbrood are recommended for only honey, pollen, royal jelly and beeswax.

- 8.4 The National Beekeepers Association submission dated 20 February 2006 suggests that the model veterinary certificate for bee products from Australia should have details of the origin of the product making up the consignment in addition to the processing premises and registration number.**

Biosecurity New Zealand response

Agreed. The requirement to list the state or territory of origin will be added to the model certificate in the import health standard for bee products from Australia prior to issue.

8.5 The National Beekeepers Association submission dated 20 February 2006 states that the NBA does not believe that there is sufficient interstate border control to prevent bee products that have not undergone the required treatments from crossing to Western Australia before they are then exported.

Biosecurity New Zealand response

The Biosecurity Authority⁵³ assessed information from Western Australia in 2001 which demonstrated the following:

- There are natural barriers that restrict the natural drift of bees which could carry European foulbrood into Western Australia. The environment (hot, lacking of water and year-round nectar/pollen sources) prevents the establishment and migration of feral colonies across the entire border between Western Australia and the eastern states. This has been validated by surveys of both the northern border area with the Northern Territory and the southern border area with South Australia, with no feral colonies being found. Only the south-west area of Western Australia is suitable to beekeeping. Although some bees are transported to the Kununurra area near the border with the Northern Territory for pollination, 20% of the hives sent north are inspected by Department of Agriculture inspector for exotic diseases such as European foulbrood.
- Since 1977, there has been legislation and border controls to prevent the importation of bees, bee products and beekeeping equipment which could carry European foulbrood into Western Australia. While Commonwealth Laws allow the importation of honey and some hive products into Australia, all honey and hive products can not be imported into Western Australia because the state legislation, the *Beekeepers Act 1963*, overrides the Commonwealth laws and prohibits their importation. Pasteurised honey⁵⁴, refined beeswax and royal jelly may enter Western Australia subject to risk assessment, health certification and, where appropriate, laboratory testing. Foods or health products containing honey, pollen, royal jelly, propolis and other hive products are restricted and subject to risk assessment prior to entry to Western Australia. Unpasteurised honey, honeycomb, unprocessed beeswax, pollen, bees, used hive equipment, used beekeeping appliances, queen bees, queen cells, packages (live bees in a wooden box), or other hive products are prohibited entry into Western Australia.
- Signs alerting travelers that honey and associated products can not be brought into Western Australia are in place at domestic and international airports. Detector dogs are trained to find bees, honey and other hive products at all Western Australian

⁵³ The section of MAF responsible for this biosecurity prior to the establishment of Biosecurity New Zealand in 2004.

⁵⁴ Western Australia uses the term pasteurisation to describe heating honey to a core temperature of 65°C for at least 8 hours.

entry points. Dogs and X-ray machines are also used to detect illegal imports at all post offices that receive overseas or interstate mail. Since the ban on imports of live bees, honey products and equipment was introduced in 1977, none of these items have been detected entering the state by post.

These natural border and imposed border controls were verified by Biosecurity New Zealand during a technical tour in March 2006.

8.6 The National Beekeepers Association submission dated 20 February 2006 seeks assurances that the Australian certifying officers are sufficiently competent with a good knowledge of bee diseases and risk management measures, and that they only sign the certificates after confirming that the conditions have been met.

Biosecurity New Zealand response

Australia operates an equivalent system to that operating in New Zealand. Neither the New Zealand nor the Australian system requires the signing official to be an expert in bee diseases or risk management measures. These officials sign on behalf of the governmental veterinary services as part of a strictly controlled and audited system.

- In Australia, a state or territory government apiary officer (experienced in the diagnosis of bee diseases and risk management measures) provides eligibility documentation for the federal government Australian Quarantine and Inspection Service official veterinarian or certifying officer.
- In New Zealand, a government approved AgriQuality Ltd⁵⁵ apiary officer experienced in the diagnosis of bee diseases and risk management measures provides eligibility documentation for the New Zealand Food Safety Authority Verification Authority official veterinarian. Biosecurity New Zealand officials in Biosecurity New Zealand are aware of any changes to disease status for each country and notify AgriQuality Ltd and the Verification Authority⁵⁶ of changes to this disease status through the modification or revocation of the import health standards.

In both cases, it is an apiary officer who is experienced in apiculture who provides the information about the presence or absence of bee diseases. The official veterinarian or certifying officer does not need to be experienced in the diagnosis of bee diseases, but does need to be aware of the country's official disease status.

8.7 The National Beekeepers Association submission dated 20 February 2006 seeks assurances that Western Australia is maintaining a surveillance and inspection programme that will underpin the certification required, and seeks assurances that

⁵⁵ The Government agency authorised by Biosecurity New Zealand under the *Biosecurity Act 1993* to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

⁵⁶ The Verification Agency is part of MAF Biosecurity New Zealand New Zealand Food Safety Authority.

there is a robust surveillance programme and reporting requirements to ensure the prompt reporting of European foulbrood disease so that the statement in clause 1.1.1 of the Veterinary Certificate for bee products from Australia can be accepted.

Biosecurity New Zealand response

Western Australia currently operates two active surveillance programmes for honey bees: the National Sentinel Hive Programme; and the Western Australia Bee Pest and Disease Surveillance and Monitoring System. In addition, Western Australia has an effective system for passive surveillance.

- **The National Sentinel Hive Programme**

Sentinel hives at each of the ports shown in Figure 2 of this review of submission are inspected quarterly for European foulbrood, and other endemic and exotic pests and diseases of honey bees. Specimens are then sent to the state Animal Health Laboratories. These specimens include external parasites collected from sticky boards placed on the bottom board of the hives for 24-48 hours, and 100 adult bees collected from each hive. Sweep-netting of bees in these port areas is done to detect any imported Asian honeybees, and there is also a requirement for the captains of all vessels to check their ships and cargo for exotic bees before reaching Australian waters. The sentinel hives and associated flowers in the port areas are also visually examined for the presence of exotic bees which may carry exotic pests and diseases.

- **The Western Australia Bee Pest and Disease Surveillance and Monitoring System**

This started in 2005 and will occur annually in addition to the National Sentinel Hive System. 120 apiaries were visited by the Department of Agriculture apiary officer in 2005, and 937 hives were inspected. As the Western Australian bee industry is much smaller than New Zealand's, this survey meant that apiaries belonging to more than 50% of the commercial beekeepers were sampled for American foulbrood, European foulbrood, exotic mites and pests⁵⁷. Only eight cases of American foulbrood were confirmed. All tests were negative for European foulbrood, exotic mites and other exotic pests. In addition, there are random inspections of hives done by Apiary Inspection officers of the Agricultural Protection program who have been trained to recognise bee diseases, and beekeepers are also encouraged to submit combs showing signs of brood diseases for inspection and diagnosis by the Animal Health Laboratory.

⁵⁷ There are 914 beekeepers in Western Australia. The majority of which are amateurs owning fewer than 50 hives. About 80% of WA beekeepers have less than 100 hives. 39 apiaries were inspected from beekeepers with 30-50 hives. 46 apiaries were inspected from beekeepers with 50-150 hives, and 35 apiaries from beekeepers owning over 151 hives.

- **The Passive Surveillance Programme**

This is based on requirements in the *Beekeepers Act 1963* that all brood diseases of bees, including European foulbrood that are found or suspected must be notified to the Senior Apiculturalist (including submission of diseased brood comb and four larval smears to the Animal Health Laboratory). An average of about 10 suspect cases per year are submitted by beekeepers and subjected to laboratory diagnosis.

Responses to European Foulbrood are not covered under the *Australia Veterinary Emergency Plan, AUSVETPLAN*. Therefore, the Department of Agriculture has developed an *Emergency Incident Management Plan* specifically to deal with such an outbreak. This plan was submitted to the Biosecurity Authority in 2001.

8.8 The National Beekeepers Association submission dated 20 February 2006 seeks assurances that the Australian surveillance programmes effectively enable the declaration of area freedoms for bee louse and small hive beetle to provide the necessary protection for New Zealand beekeepers.

Biosecurity New Zealand response

All states and territories of Australia have surveillance systems present to detect the presence of exotic bees and parasites, small hive beetle and bee louse: the *National Sentinel Hive Programme* which involves the inspection of sentinel hives in at least 27 seaports and log traps quarterly for varroa, tropilaelaps and tracheal mites, and *Apis cerana*, respectively⁵⁸; and passive surveillance where beekeepers are required to notify the presence of notifiable diseases. In addition, there are AQIS inspections of vessels and cargo at ports upon arrival. The states and territories that have been recognised as free from small hive beetle and bee louse by Biosecurity New Zealand⁵⁹ all have this pest listed as notifiable and beekeepers are required to report the presence of these pests or suspected presence of these pests either immediately, within 12 hours, or within 24 hours. Failure to report small hive beetle and bee louse in each of these states and territories carries strict penalties including fines and imprisonment. Responses to bee louse outbreaks or suspected bee louse outbreaks are managed under the *Australian Veterinary Emergency Plan*

⁵⁸ The absence of Asian honeybees, and varroa, tracheal, and tropilaelaps mites are confirmed by log traps with pheromone lures in targeted locations, and the addition of acaricide strips in hives for 24-48 hours in conjunction with sticky boards placed on the bottom board of the hives, respectively. Thirty to 50 adult bees are collected from each hive for internal examination. Specimens are then sent to the State/Territory Government Animal Health Laboratories or CSIRO (Black Mountain, Canberra). If pests are found in the sentinel hives, the *Australian Veterinary Emergency Plan (AUSVETPLAN for Bee diseases and pests (Version 3.0))* would be enacted viz. sentinel hive and its colony shall be destroyed immediately and surveillance carried out within a 10 km radius.

⁵⁹ Australian Capital Territory, Northern Territories, South Australia, Tasmania and Western Australia are recognised as free from small hive beetle. Australian Capital Territory, New South Wales, Northern Territories, Queensland, South Australia, Victoria, and Western Australia are recognised as free from bee louse. Reporting requirements for each state and territory are listed in table 1 of this review of submissions.

AUSVETPLAN. Outbreaks or suspected outbreaks of small hive beetle are also managed under a national plan, the *National Small Hive Beetle Management Plan*⁶⁰.

- 8.9 The National Beekeepers Association submission dated 20 February 2006 requests verification that the heat treatments required in clause 1.1.2 of the veterinary certificate in the draft import health standards effectively kill all *M. pluton*, because the minimum infective dose is not known and as a result, a less than 100% kill presents an unacceptable risk to New Zealand beekeepers.**

Biosecurity New Zealand response

Biosecurity New Zealand agrees that the concentration of bacteria required to start a new European foulbrood infection is unknown. A leading international researcher on this disease has suggested that determining this level would be exceptionally difficult, given the wide range of factors that would influence it. These include the number of bees in a colony, the relative proportions of bees of different ages, the availability of other food sources, and genetic variability among bee populations. While an infective dose level would be very useful to have, it is unknown to science, and there appears to be little prospect of it being measured in either the short or long term. Biosecurity New Zealand imposes biosecurity measures regarding many other diseases for which the infective dose is unknown.

Biosecurity New Zealand is obliged to make a decision based on the information that is available, rather than the information that is desirable. Biosecurity New Zealand has used all available information on the epidemiology of European foulbrood in order to reach its conclusions on the safety of honey treated to ensure a million-fold reduction of European foulbrood organism levels. A 6D (or million-fold) reduction in organism numbers means that 99.9999% of organisms have been inactivated, and for honey that initially contains the maximum level reported in the scientific literature, the final concentration would mean that a bee would have to consume on average 300 ml to encounter even a single European foulbrood organism. Notwithstanding the absence of precise scientific information on the infectious dose of European foulbrood, the available scientific information suggests that the likelihood of infection being introduced into a honey bee colony by such a low concentration of any pathogen is extremely remote. The 6D reduction is a standard principle used in human food safety assessment, and the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) has been reviewed by international experts in bee diseases and judged to be technically robust. The decision that the resulting honey can be considered to pose a negligible risk is not inconsistent with the level of protection (4D or 5D) achieved by international standards for heat treatment of milk products from countries or zones with foot and mouth disease.

- 8.10 The National Beekeepers Association submission dated 20 February 2006 requests that clause 1.2.1 of the veterinary certificate in the draft import health standards be amended so that the inspection for American foulbrood is within 7 days prior to**

⁶⁰ The national plan to control the spread of small hive beetle and respond to outbreaks was endorsed by a SHB steering committee of Animal Health Australia and is available online at http://www.honeybee.org.au/SHB_FINAL_Mgt_Plan_AHA%2031-10-03_.pdf

harvest and not the currently specified 12 months. This would align it with the requirement in the American foulbrood Pest Management Strategy for all cases to be reported within 7 days that New Zealand beekeepers are obliged to comply with. The National Beekeepers Association states that clinical signs of American foulbrood can become apparent within 21 days, so the 12 month period is too long, and suggests that the current clause 1.2.1 does not show equivalence.

Biosecurity New Zealand response

The requirement to report known cases within 7 days of detection is not the same as a requirement to inspect hives prior to honey harvesting. The New Zealand American Foulbrood National Pest Management Strategy legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*⁶¹ is focused on transmission from hive to hive rather than transmission through commercially packed honey. This is reflected in the absence of any requirement in the National Pest Management Strategy for beekeepers to check the American foulbrood status of hives at the time of honey harvesting, or limits on spore levels in commercially traded honey. The risk management measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products (2004)* are designed to ensure that the level of spores in imported honey is not significantly greater than that in New Zealand produced honey, in order to be compliant with the *World Trade Organisation Sanitary and Phytosanitary Agreement*. Certification that the honey was not derived from hives known or suspected to be clinically affected by American foulbrood, backed up by annual inspection, is considered to provide a level of protection that is broadly equivalent to that achieved by the New Zealand American Foulbrood National Pest Management Strategy.

- 8.11 The National Beekeepers Association submission dated 20 February 2006 notes that clause 1.2.4 of the Veterinary Certificate in the draft import health standards will permit irradiated bee products including honey to be sold in New Zealand for human consumption. The sale of irradiated foods is currently not allowed in New Zealand except for a very narrow range of products.**

Biosecurity New Zealand response

Although irradiation is considered to address biosecurity concerns in imported bee products, permitting irradiated food to be imported into New Zealand or not is a food safety issue, and therefore the responsibility of New Zealand Food Safety Authority.

However, Biosecurity New Zealand is aware that the irradiation of food is subject to the *Australia New Zealand Food Standards Code. Standard 1.5.3 Irradiation of Food* which prohibits irradiation of food unless specific permission is given. The draft import health standards have two clauses to inform importers that there may be additional regulations relating to food safety. The first clause is clause 2.1 which states that:

⁶¹ The *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* is available online at <http://www.knowledge-basket.co.nz/regs/regs/text/1998/1998260.txt>

Commercial consignments of products imported into New Zealand for human consumption must comply with the Food Act 1981. These requirements are independent of the import health standard requirements and are managed by the New Zealand Food Safety Authority (NZFSA). Importers are advised to consult the NZFSA website: www.nzfsa.govt.nz/imported-food/index.htm or contact the NZFSA.

The second clause is note 4 following clause 7.3 which states that:

Irradiated foods intended for human consumption are not eligible for import into New Zealand unless they have been through a pre-market safety assessment process conducted by the Food Safety Association of New Zealand. Further information is available from the New Zealand Food Safety Authority website at <http://www.nzfsa.govt.nz/consumers/food-safety-topics/food-processing-labelling/food-irradiation/index.htm>.

This note explains the need for a pre-market safety assessment and if importers look at the website link they will see that bee products are not listed as one of the irradiated foods eligible for import into New Zealand. Honey bee products incorporated into medicines and nutraceuticals, such as pollen capsules, are not defined as foods and may be eligible for import. Importers should contact the New Zealand Food Safety Authority NZFSA to check the eligibility status of any bee products as this status may change.

- 8.12 The National Beekeepers Association submission dated 20 February 2006 requests that clause 2.2.1 of the Veterinary Certificate for bulk extracted honey from Australia be amended from *the honey originates from a state other than Queensland, New South Wales, or Victoria and A. tumida has not been reported in this state*; to: “... reported in the State of origin.”**

Biosecurity New Zealand response

Agreed. The import health standard will be amended accordingly.

- 8.13 The National Beekeepers Association submission dated 20 February 2006 requests that in addition, there should be a declaration that the use of antibiotics and other chemicals has been in accordance to label instructions, to ensure that there are no residues in imported products. This includes assurances that antibiotics have not been used prior to harvest to ensure that disease signs have not been suppressed.**

Biosecurity New Zealand response

Residues are a food safety issue and the responsibility of the New Zealand Food Safety Authority rather than Biosecurity New Zealand. The *Australian National Residue Survey Programme*⁶² has been monitoring for the following antibiotic residues in honey since

⁶² As recommended in *Codex Alimentarius* guidelines, Australia operates a statistical risk-based approach to residue monitoring. Stratified random samples are taken focusing on high-risk producers or areas. Collection of samples at the producer or packer level is approved by state government apiary officers, so that these officers can trace back and investigate any positive samples. This *National Residue Survey Programme* is operated by the Australian Department of Agriculture Fisheries and Forestry. The results of the *National Residue Survey Annual Report* are available online at <http://www.daff.gov.au/content/output.cfm?ObjectID=715E69E1-5C4B-4439-84A2091FE098AD6D>.

2002. As Table 2 of this review of submissions indicates no antibiotics have been detected in the past three years in national Australian honey samples.

It is also important to recognise that under the Trans Tasman Mutual Recognition Arrangement signed on 1 May 1998, food (including honey) produced in Australia that complies with the Maximum Residue Levels (MRLs) in the *Australia New Zealand Food Standards Code* can be legally sold in New Zealand.

This agreement also means that honey produced in New Zealand that complies with the *New Zealand (Maximum Residue Limits of Agricultural Compounds) Mandatory Food Standard, 1999* can be legally sold in Australia. More honey is imported into Australia from New Zealand than from any other country and New Zealand honey is often subject to exposure to varroa treatments and other pesticides, so this arrangement is critical for maintaining the export of New Zealand honey to Australia.

8.14 The National Beekeepers Association submission dated 20 February 2006 notes that the number of Pacific Island countries has been extended to what had been previously allowed to export to New Zealand.

Biosecurity New Zealand response

There have been two import health standards for bee products operating for the last five years:

- the import health standard for the importation of honey and propolis from Pitcairn Island, BEEHONIC.PIT, which covered products from Pitcairn Island; and
- the import health standard for the importation of specified bee products from all countries, BEEPROIC.ALL, which covered honey and propolis from Niue, Solomon Islands, Tonga, Tuvalu and Western Samoa. The countries on the draft import health standard are the same as those on the existing import health standards.

8.15 The National Beekeepers Association submission dated 20 February 2006 questions the knowledge of bee diseases and risk management measures of official veterinarians who would sign export certificates for Pacific Island bee products and requests details of the Pacific Island surveillance programme to enable a declaration of area freedom and information about any audit procedures of certification.

Biosecurity New Zealand response

Over the next six months, Biosecurity New Zealand officials will work with officials from the Ministry of Foreign Affairs and Trade (MFAT), Niue, Pitcairn Island, Samoa, Solomon Islands, Tonga and Tuvalu to develop an implementation plan to ensure that honey bee product imports can be managed under the recommendations of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

Biosecurity New Zealand will ensure that it has a high level of assurance that government officials from these countries can certify that the honey bee products meet the requirements stated in the draft import health standard for bee products from specified Pacific Island countries. No final import health standard will be issued for honey products from specified Pacific Island countries until the implementation plan is completed for each country.

The first step in the process of developing the implementation plan will be an assessment of each country's honey bee health status. AgriQuality Ltd⁶³ assessed the honey bee health status of Niue and Samoa in preparation for the changes to New Zealand's import health conditions.

A draft report on Samoa's honey bee health status has been recently completed and indicates that Samoa is still free from American foulbrood, European foulbrood, bee louse, small hive beetle, *Varroa* species mites and *Euvarroa* species mites⁶⁴. Biosecurity New Zealand is waiting on the results of a similar report on Niue's honey bee health status, but is assured that Niue like Samoa has an enviably high honey bee health status. The honey bee health status of Pitcairn Island, Solomon Islands and Tuvalu will also need to be re-assessed in a similar manner as part of this implementation plan. The next step will be to ensure that the government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases and approve a system for auditing each countries surveillance programme.

8.16 The National Beekeepers Association submission dated 20 February 2006 requests that the IHS should contain a restriction to prevent the re-exportation of importation of Pacific Island products.

Biosecurity New Zealand response

Import health standards contain the import controls and information that relate to biosecurity. Exportation of New Zealand honey is not a biosecurity issue.

8.17 The National Beekeepers Association submission dated 20 February 2006 requests that the Pacific Island products should also have the country of origin clearly displayed on the product.

Biosecurity New Zealand response

Agreed. The following clause will be added to the import health standard for bee products from specified Pacific Island countries prior to issue:

⁶³ The Government agency authorised by Biosecurity New Zealand under the Biosecurity Act 1993 to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

⁶⁴ This report outlines a survey of 294 of Samoa's beehives out of the national total of 467 hives and the survey was completed by AgriQuality Ltd. This report states that a *Bee and Bee Product Prohibition Order* was issued in 1999 under the *Customs Act 1977*. This report also provided a plan for the training of Samoan government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases.

These bee products are eligible for importation as long as the consignment meets all conditions of this import health standard, and are clearly labelled as being product of Niue, Pitcairn Island, Samoa, the Solomon Islands, Tonga, or Tuvalu.

- 8.18 The National Beekeepers Association submission dated 20 February 2006 asks for clause 2.1.4 of the Veterinary Certificate for Pacific Island products to be amended from: *the product has been frozen at -18 °C for 48 hours* to: “... for at least 48 hours.”**
Biosecurity New Zealand response

Agreed. The import health standard will be amended accordingly prior to issue.

- 8.19 The National Beekeepers Association submission dated 19 May 2006 states their concern that *Nosema ceranae* has not been included in the risk analysis. It asks for an assessment of the risk posed by imports of bee products containing this organism and how these risks will be managed.**

Biosecurity New Zealand response

Biosecurity New Zealand has assessed the risks posed by the importation of *Nosema ceranae*. A technical report is included in the appendix of this review of submissions document.

The status of *Nosema ceranae* is unknown in Australia and New Zealand. Nosemosis caused by a closely related microsporidian parasite, *Nosema apis*, is endemic in *A. mellifera* bees both Australia and New Zealand. As the host of *N. ceranae* is assumed to be the Asian honey bee, *Apis ceranae*, and *N. apis* is sensitive to treatments for bee products (heating and irradiation), it can be assumed that there is a higher likelihood of introduction of *N. ceranae* into countries, if these countries import untreated bee products from countries with the Asian honey bee *A. ceranae*.

New Zealand, Western Australia and the Pacific Islands specified in the draft import health standards do not import untreated bee products from countries with *A. ceranae*. Therefore Niue, Pitcairn Island, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and Western Australia can be recognised as being free from *N. ceranae* on the same basis as New Zealand.

New Zealand will add to the import health standard for bee products from Australia the measures for nosemosis recommended in the technical report. These measures will be limited to bee products from states and territories of Australia other than Western Australia as these states and territories import bees and untreated bee products from countries where the Asian honey bee (*Apis ceranae*) is present. The nosemosis measures may be exempted in the future for countries or territories that Biosecurity New Zealand recognises as free from *N. ceranae* on the basis of a freedom case. These measures may also be revoked if scientific evidence arises to demonstrate that *N. ceranae* does not cause a more severe clinical disease syndrome than *N. apis*.

The likelihood of release from the products listed in the import health standard for specified bee products from all countries is negligible, so no sanitary measures have been added to this import health standard.

9 Airborne Honey Ltd - Peter Bray

9.1 **The Airborne Honey Ltd submission states that there is no reference for the honey culture test required in the draft import standard and asks for a repeatable analytical method of sufficient sensitivity to be developed standardised and published before this import condition can be certified.**

Biosecurity New Zealand response

State and territory government officials have considerable experience spore testing honey and have developed sampling protocols to detect single spores of American foulbrood so that the infection can be traced back to individual hives and apiaries. Samples are submitted to Animal Health Laboratories which are accredited by the National Association of Testing Authorities (NATA). These state/territory government animal health laboratories use the test described in detail in the sub-committee's standard, *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2003). As the Australian and New Zealand Standard Diagnostic Procedures are consistent with listed in the *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*⁶⁵ it will use the sampling methodology specified in this manual⁶⁶. This methodology requires samples to be sufficient so that there is at least a 95% probability of detecting American foulbrood infection in each apiary.

Import health standards do not include references as they are legal rather than scientific documents. There is a requirement for tests specified in the model zoosanitary certificate to be either approved by Biosecurity New Zealand or to be tests specified in the *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*⁶⁷. In this case, the Honey Culture Test meets both requirements. It was developed by the Australian New Zealand official governmental Sub Committee on Animal Health Laboratory Standards⁶⁸ and is described in detail in the standard, *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2003). These *Australian and New Zealand Standard Diagnostic Procedures* are consistent with the *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (2005).

To clarify this issue, the clause on the Honey Culture Test has been modified to state that:

⁶⁵ The *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* is available online at http://www.oie.int/eng/normes/en_mmanual.htm

⁶⁶ Information about the OIE World sampling is available at http://www.oie.int/eng/normes/mmanual/A_00011.htm

⁶⁷ The *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* is available online at http://www.oie.int/eng/normes/en_mmanual.htm

⁶⁸ The Sub Committee on Animal Health Laboratory Standards is a sub-committee of the Animal Health Committee, reporting to Australian Primary Industries Standing Committee, and represents the activities of the veterinary laboratory network of Australia and New Zealand. The *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2003) is available online at <http://rrr.online.wa.gov.au/scahls/standards.htm>

The bee products have been subject to one of the following risk management measures for American foulbrood (Paenibacillus larvae larvae):

- have been subjected to the test specified as Culture of P l larvae from bulk honey for detection of American foulbrood in Appendix 2 of the Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases (2003) in an official laboratory, and found to have a P. l. larvae spore count of less than 500,000 per litre;

- 9.2 The Airborne Honey Ltd submission states that the causative agent of American Foulbrood, *Paenibacillus larvae larvae*, is very difficult to culture⁶⁹ and this method detects down to approximately 20,000,000 spores per litre.**

Biosecurity New Zealand response

The quote taken from the risk analysis has been taken out of context. It is used to argue why there is a negligible risk that the causative agent of American Foulbrood, *Paenibacillus larvae larvae* will infect any organisms other than *A. mellifera*.

The standard, *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2000) states that:

The culture of bulk honey samples for P l larvae spores and traceback to hives from which infected honey was extracted can be an effective means of detecting AFB outbreaks (Appendix 2). The culture of honey samples can also be used as a monitoring system for the presence of P l larvae spores and is an effective means of determining the prevalence of this organism in beekeeping areas. (pg 3)

- 9.3 The Airborne Honey Ltd submission states that there is a high incidence of *Paenibacillus alvei* spores in honey (often > 50%) and this will result in significant problems with the culturing and identification of *P. l. l.***

Biosecurity New Zealand response

The standard, *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2000) suggests that sheep blood agar comprising Blood Agar Base No. 2 supplemented with 7% citrated ovine blood and nalidixic acid can be used in areas where European foulbrood is endemic to inhibit the growth of the *Paenibacillus alvei*. As this is covered in this standard, no other safeguards are required in the import health standard.

- 9.4 The Airborne Honey Ltd submission claims that American Foulbrood spreads under the masking effect of oxytetracycline, and prophylactic feeding of oxytetracycline occurs in Australia.**

⁶⁹ The submitter states that this is acknowledged in the MAF import risk analysis for bee products.

Biosecurity New Zealand response

Biosecurity New Zealand understands that oxytetracycline is fed under prescription on mainland Australia only for European foulbrood. The feeding of oxytetracycline for American foulbrood is limited to Tasmania, as it is the only state that permits treatment of AFB with antibiotics.

The report *Rural Industries Research and Development Corporation: Commercial Beekeeping in Australia* (2003)⁷⁰ states that “since oxytetracycline treatments are undertaken in the spring in Tasmania, when the hives are being fed sugar and well before the honey flow commences, there is little likelihood of residues of OTC occurring in the honey”. The *Australian National Residue Survey Programme*⁷¹ has been monitoring for the following antibiotic residues in honey since 2002. As Table 2 of this review of submissions indicates no antibiotics have been detected in the past three years in national Australian honey samples.

- 9.5 The Airborne Honey Ltd submission queries Biosecurity New Zealand’s response to a question about oxytetracycline masking American foulbrood in the review of submissions on the risk analysis, Biosecurity New Zealand stated that “In a hive with no clinical signs there will be few infected (dead) larvae and therefore low spore numbers. If there are no clinical signs of infection, regardless of OTC usage, the risk is considered acceptable”. It states that this is an incorrect understanding by Biosecurity New Zealand as oxytetracycline feeding is a control practice that gives a high degree of probability that spore levels will routinely be above the specified level of 50,000 spores per litre.**

Biosecurity New Zealand response

Biosecurity New Zealand has found no information in the scientific literature to support the above speculation. Biosecurity New Zealand has assumed that the level of spores in a hive is broadly proportional to the level of clinical signs of American foulbrood that were present in the hive at the time the honey was formed, with or without the feeding of oxytetracycline. This is based on Australian research and backed up by expert opinion.

- 9.6 The Airborne Honey Ltd submission claims that inspection of hives at the time of honey harvest for clinical symptoms of American foulbrood with or without oxytetracycline feeding will do little to prevent honey with >500,000 spores per litre arriving in New Zealand. Therefore, clause 1.2.1 of the model veterinary certificate will not provide a negligible risk of honey with infectious levels of P. I. 1 in honey.**

⁷⁰ *Rural Industries Research and Development Corporation: Commercial Beekeeping in Australia* (2003) is available online at <http://www.rirdc.gov.au/reports/HBE/03-037.pdf>

⁷¹ As recommended in *Codex Alimentarius* guidelines, Australia operates a statistical risk-based approach to residue monitoring. Stratified random samples are taken focusing on high-risk producers or areas. Collection of samples at the producer or packer level is approved by state government apiary officers, so that these officers can trace back and investigate any positive samples. This *National Residue Survey Programme* is operated by the Australian Department of Agriculture Fisheries and Forestry. The results of the *National Residue Survey Annual Report* are available online at <http://www.daff.gov.au/content/output.cfm?ObjectID=715E69E1-5C4B-4439-84A2091FE098AD6D>.

Biosecurity New Zealand response

The import health standards contain no requirement to inspect hives at the time of honey harvest. The New Zealand National Pest Management Strategy for American Foulbrood legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*⁷² is focused on transmission from hive to hive rather than transmission through commercially packed honey. This is reflected in the absence of any requirement in the National Pest Management Strategy for beekeepers to check the American foulbrood status of hives at the time of honey harvesting, or limits on spore levels in commercially traded honey. The risk management measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) are designed to ensure that the level of spores in imported honey is not significantly greater than that in New Zealand produced honey, in order to be compliant with the *World Trade Organisation Sanitary and Phytosanitary Agreement*. Certification that the honey was not derived from hives known or suspected to be clinically affected by American foulbrood, backed up by annual inspection, is considered to provide a level of protection that is broadly equivalent to that achieved by the National Pest Management Strategy.

- 9.7 This requirement for 12 month inspection is not equivalent to that achieved under the New Zealand National Pest Management Strategy (PMS) as the PMS relies on interrelated measures such as a long history of American foulbrood control and an antibiotic free environment. In contrast, American foulbrood control in Australia is inconsistent. The differences between the two situations have been outlined in the table below, and indicates that as the two contexts for inspection are different, they are not equivalent:**

	New Zealand	Australia
National American foulbrood Programme in place	Yes	Run state by state, no uniformity
National database of hives	Yes	No
Registration of apiaries	Mandatory including hive numbers and 1:50,000 Map Grid Reference	Less than 10% of beekeepers registering hives
GIS mapping of hives and disease	Yes	No
Requirement to destroy hives and equipment	Yes	No
Legislative controls for infective honey	Yes	No
Compulsory annual reporting by beekeepers for American foulbrood	Yes	No

⁷² The *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998* is available online at <http://www.knowledge-basket.co.nz/regs/regs/text/1998/1998260.txt>

Annual auditing of system via samples of bees, honey and larvae	Yes	No
Targeted inspections and “diseaseathons” resulting from tracing and audits	Yes	No
Annual inspection of all hives for American foulbrood	Yes	No
Beekeeper training	Disease Elimination Conformity Agreement (DECA) conditional on training and examination	Ad hoc – not linked to control programme – no examination requirement to ensure training effective
Drug feeding and associated problems with making clinical symptoms of American foulbrood	Not permitted. Oxytetracycline not found in Residue Testing programme.	Routine prophylactic use with American foulbrood spreading due to masking.
<i>Paenibacillus larvae larvae</i> spores in honey	2.1% for 2005, level has been decreasing for last 4 years lowest recorded in World	12.5% for 1991 showing 280% increase over previous 7 years. No subsequent published nationwide data. Probably increasing.
Presence of <i>Paenibacillus alvei</i> obscuring results from Honey Culture Test (HCT) for American foulbrood	No	Yes

Biosecurity New Zealand Response

The risk management measures recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) are designed to ensure that the level of spores in imported honey is not significantly greater than that in New Zealand produced honey, in order to be compliant with the *World Trade Organisation Sanitary and Phytosanitary Agreement*⁷³.

Certification that the honey was not derived from hives known or suspected to be clinically affected by American foulbrood, backed up by annual inspection, is considered to provide a level of protection that is broadly equivalent to that achieved by the New Zealand Pest Management Strategy legislated through the *Biosecurity (National American Foulbrood Pest Management Strategy) Order 1998*.

⁷³ Information about the World Trade Organisation Sanitary and Phytosanitary Agreement is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>

9.8 The Airborne Honey Ltd submission cites industry opposition to the European foulbrood control measures recommended in the import risk analysis on two points:

- **Any assessment of the likely numbers of the causative agent of European Foul Brood, *Melissococcus pluton*, in honey is difficult [as cited in references] and there is only one limited study on the number of *M. pluton* bacteria in honey;**
- **There is no study on the minimum infective dose of *M. pluton*.**

Biosecurity New Zealand response

The *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) acknowledges there is limited information on European foulbrood concentrations in honey, with only a single paper from Australia (Wootton, 1981) directly addressing this point. However, there is no reason to suppose that the bacterial levels are not typical of those found elsewhere. Wootton collected honey samples from a limited number of colonies infested with European foulbrood and tested the levels of European foulbrood in the honey. The maximum level recorded was 3.3×10^3 . Biosecurity New Zealand considers it has acted prudently in citing the maximum reported level in the risk analysis. A commercial consignment of honey would originate from a large number (likely to be hundreds, or even thousands) of hives. Other research suggests that many honey samples from areas with endemic European foulbrood will display no detectable sign of European foulbrood. Imposing measures designed to treat a bulk honey sample derived from multiple colonies a having higher levels of European foulbrood than the highest recorded level from a single colony would be difficult to defend.

Biosecurity New Zealand agrees that the concentration of bacteria required to start a new European foulbrood infection is unknown. A leading international researcher on this disease has suggested that determining this level would be exceptionally difficult, given the wide range of factors that would influence it. These include the number of bees in a colony, the relative proportions of bees of different ages, the availability of other food sources, and genetic variability among bee populations. While an infective dose level would be very useful to have, it is unknown to science, and there appears to be little prospect of it being measured in either the short or long term. Biosecurity New Zealand imposes biosecurity measures regarding many other diseases for which the infective dose is unknown.

9.9 The Airborne Honey Ltd submission notes that Western Australia has remained free from European foulbrood by requiring imported honey to be heated to 65°C for 8 hours, yet the import risk analysis only requires 65°C for 4 hours and 7 minutes, and questions why Biosecurity New Zealand are prepared to use a heat treatment that is half that required by Australian authorities for interstate movements.

Biosecurity New Zealand response

The effect of heat in the inactivation of European foulbrood is fully discussed in section 21.3.2.1 of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). Biosecurity New Zealand's understanding, based on information received from the Western Australian State Government in 2001, is that the time/temperature treatment

for honey imported from other Australian states was initially based on the results of the Wootton et al (1981) work discussed in the risk analysis. This work estimated the maximum 'thermal death time' for *M. pluton* to be 8 hours at 60°C, and this was initially the time temperature requirement when pasteurised honey was first allowed into WA from other states. However, for reasons not known to Biosecurity New Zealand, nor fully explained in the WA documents related to their case for European foulbrood freedom, the time/temperature regime changed at some point to, as the submitter points out, 65°C for 8 hours. Biosecurity New Zealand has been told anecdotally that the 65°C / 8 hrs regime was instituted only in 1997, in response to an incursion of chalkbrood. However, as discussed in the risk analysis, Biosecurity New Zealand considered the Wootton et al (1981) data to be incomplete, and therefore Biosecurity New Zealand commissioned further study into the heat inactivation of European foulbrood. This work was completed in 2001 and is referred to as Ball et al (2001). However, as explained on page 74 of the risk analysis, expert statistical advice available to Biosecurity New Zealand indicated that the calculation of 'thermal death time' and 'extinction time' was not mathematically sound. As a result of that, Biosecurity New Zealand commissioned a HortResearch statistician to re-analyse the results of both datasets and to calculate a new inactivation curve, which was an exponential model rather than a straight line relationship. This allowed Biosecurity New Zealand to consider the level of protection gained by different time/temperature regimes in terms of required D values, as discussed on page 75 of the risk analysis. The question that Biosecurity New Zealand faced, was essentially "how safe is safe enough". Biosecurity New Zealand's consideration of this matter is documented on page 75 of the risk analysis, in particular the thinking behind choosing a 6D level of protection rather than the lesser 4 D level.

Thus, Biosecurity New Zealand has used all available information on the epidemiology of European foulbrood in order to reach its conclusions on the safety of honey treated to ensure a million-fold reduction of European foulbrood organism levels. A 6D (or million-fold) reduction in organism numbers means that 99.9999% of organisms have been inactivated, and for honey that initially contains the maximum level reported in the scientific literature, the final concentration would mean that a bee would have to consume on average 300 ml to encounter even a single European foulbrood organism. Notwithstanding the absence of precise scientific information on the infectious dose of European foulbrood, the available scientific information suggests that the likelihood of infection being introduced into a honey bee colony by such a low concentration of any pathogen is extremely remote. The 6D reduction is a standard principle used in human food safety assessment, and the bee products risk analysis has been reviewed by international experts in bee diseases and judged to be technically robust. The decision that the resulting honey can be considered to pose a negligible risk is not inconsistent with the level of protection (4D or 5D) achieved by international standards for heat treatment of milk products from countries or zones with foot and mouth disease.

It is worth noting that the Cox & Domijan model used in developing table 5 on page 75 of the risk analysis shows that the level of protection gained by application of the Wootton et al (1981) results and analysis alone (60°C for 8 hours) is less than 6D. The Cox & Domijan model shows that 9.6 hours is required at 60°C to achieve a 6 D reduction, which means that the Biosecurity New Zealand recommendations are in fact more risk averse

than the original requirements for European foulbrood that were instituted by the Western Australians. The fact that the current Western Australian pasteurisation requirements of 65°C / 8 hrs are no longer based on the Wootton et al (1981) risk analysis only serves to underline the difficulties in standard setting that are inherent in this area.

However, it should be remembered that a whole chain of events would have to take place for European foulbrood to become established in New Zealand, and heat treatment is only one of the obstacles in the way (albeit an important one).

- Step 1: Honey would have to contain European foulbrood bacteria (many honey samples from European foulbrood-infested regions show no measurable sign of this disease when tested).
- Step 2: Some bacteria must survive the heat treatment process.
- Step 3: The honey is shipped to New Zealand, but not consumed by humans.
- Step 4: The honey is exposed to foraging bees.
- Step 5: A bee actually collects one or more bacteria and returns with it to the colony.
- Step 6: The number of bacteria is adequate to start a new European foulbrood infection.

All of these steps would have to occur for a new infection to result. While the heat treatment is a key step in the process, tiny numbers of surviving bacteria are not in themselves necessarily going to start a European foulbrood infection. If that were so, then European foulbrood would already be in the country as a result of the illegal importation of honey, which undoubtedly occurs. Each year Biosecurity New Zealand confiscates several tonnes of honey products from arriving travelers, and Biosecurity New Zealand knows that some slippage occurs despite the strongest border measures in the world being applied. This honey will not have been subject to heat treatments such as those required in the IHS, and it is therefore likely to be a million times more infectious than honey imported according to the requirements of the risk analysis. The fact that New Zealand does not yet have European foulbrood highlights the significance of the steps 3-6 above.

Each year Biosecurity New Zealand confiscates several tonnes of honey products from arriving travelers, and Biosecurity New Zealand knows that some slippage occurs despite the strongest border measures in the world being applied. This honey will not have been subject to heat treatments such as those required in the IHS, and it is therefore likely to be many many times more infectious than honey imported according to the requirements of the risk analysis. The fact that New Zealand does not yet have European foulbrood highlights the significance of the steps 3-6 above.

9.10 The Airborne Honey Ltd submission questions why the honey component of composite products containing less than 2% can be imported with a manufacturer's declaration of the honey content rather than the same controls as honey products.

Biosecurity New Zealand response

Biosecurity New Zealand commissioned HortResearch to investigate the lowest concentration of honey or sugar water that would be attractive to bees. The study tested trained bees on kamahi honey, nodding thistle honey, manuka honey, rata honey, clover honey, South Island honey dew, sucrose, glucose, fructose and maltose. While bees were attracted to some of the honeys only at higher percentages, it was found that the lowest concentration of the most attractive honeys in the study was 2%. It was decided that this level would be feasible, and that many of the processed products are packaged and processed so that they pose very low risk.

Asking importers to submit zoosanitary certification that demonstrates that the honey has been subject to risk management measures for pests and diseases of concern to New Zealand is not justifiable products that contain less than 2% honey are unlikely to be attractive to bees and thus there is a negligible risk of bees being exposed to any infective agents.

10 Federated Farmers New Zealand Beekeeper Industry Group (NZBIG)

10.1 The New Zealand Beekeeper Industry Group requested more detail on Biosecurity New Zealand's proposed case-by-case assessment of composite products with over 2% honey, pollen or royal jelly, and the criteria that the products will be expected to meet.

Biosecurity New Zealand response

The application form in the appendices of the draft import health standard for the importation of specified bee products from all countries asks importers to specify the information about each composite product, whether any permits have been previously issued for similar products, the proportion of bee product ingredients likely to be attractive to bees, the origin of the bee products, whether the product has been heat treated or irradiated, and the final use of the product.

Biosecurity New Zealand is developing an internal implementation plan for this import health standard. This implementation plan will specify high level processes for case-by-case risk assessments of composite products, and will ensure that decisions made in this assessment process are consistently applied and based the assumptions in the import *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). The implementation plan will be completed prior to issuing the import health standard for the importation of specified bee products from all countries.

Although this implementation plan has not been completed, Biosecurity New Zealand have produced table 3 which outlines the questions that were included in the application form, and how information pertaining to these questions may be used to assess the biosecurity risk posed by each product in the future.

Table 3: Information Used to Make Case-by-Case Risk Assessments of Composite Products

Type of information requested	Rationale for requiring this information
Country of origin, product name and description	To specify and identify the product
	This information will not be used to make decisions about risk
How the product is packaged, contained or sealed	To assess the likelihood of spillage or interference
	Robust packaging and sealing of containers reduces the likelihood of spillage and increases product integrity
Whether the product is packaged for direct retail sale	To assess the likelihood of re-processing.
	Packaging of product for direct retail sale reduces the likelihood that the product will be re-processed and made more attractive to bees
Details of labelling	To assess the product's end use and verify product.
Quantity (No. of cartons/boxed/packages etc.)	To assess likelihood of re-processing
	Packaging of product into smaller size portions reduces the likelihood that the product will be re-processed and made more attractive to bees
Whether permits have been issued for similar products	To assess the existing trade and provide any background information about the proposed import
	This information will not be used to make decisions about risk
Proportion of ingredients likely to be attractive to bees or consumed by bees	To assess whether bees are likely to be attracted to the product or be able to consume the product
	Bees are attracted to honey, pollen, royal jelly and sugar. Liquids are easier for bees to ingest than some solids.
Country or countries of origin for all bee product ingredients	To assess whether the product needs to have been processed to manage American foulbrood and European foulbrood as stated in the <i>Biosecurity New Zealand Import Risk Analysis: Honey Bee Products</i> (2004)
Heat treatment and mixing the product has undergone during manufacture	To assess whether the product has been sufficiently heat treated to manage the risk of American foulbrood and European foulbrood. All products will need to be heat treated to at least ensure a 6-D reduction of European foulbrood
Irradiation of product to at least 15kGy	To assess whether the product has been sufficiently irradiated to manage the risk of American foulbrood and European foulbrood
Intended use of the product	To assess the product's end use and likelihood of re-processing

10.2 The New Zealand Beekeeper Industry Group asked whether composite products that have been given a permit to import will be tested or visually inspected when they arrive in New Zealand.

Biosecurity New Zealand response

As discussed in a previous response, permits will be issued for composite products which have been assessed as posing a negligible risk because of the way they are processed and packaged. It is highly unlikely that Biosecurity New Zealand will require post arrival testing of composite products, as the only test recommended in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) is spore counting for American foulbrood, and this measure can only be an option for managing American foulbrood when it is officially certified in a zoosanitary certificate as it requires a government approved sampling strategy, laboratory protocols in government animal health laboratories, and export certification to be set up.

10.3 The New Zealand Beekeeper Industry Group requested information pertaining to Western Australia's freedom case such as the border control between Western Australia and the other states to establish whether Western Australia is effectively isolated from the other states.

Biosecurity New Zealand response

The Biosecurity Authority⁷⁴ assessed information from Western Australia in 2001 which demonstrated the following:

- There are natural barriers that restrict the natural drift of bees which could carry European foulbrood into Western Australia. The environment (hot, lacking of water and year-round nectar/pollen sources) prevents the establishment and migration of feral colonies across the entire border between Western Australia and the eastern states. This has been validated by surveys of both the northern border area with the Northern Territory and the southern border area with South Australia, with no feral colonies being found. Only the south-west area of Western Australia is suitable to beekeeping. Although some bees are transported to the Kununurra area near the border with the Northern Territory for pollination, 20% of the hives sent north are inspected by Department of Agriculture inspector for exotic diseases such as European foulbrood.
- Since 1977, there has been legislation and border controls to prevent the importation of bees, bee products and beekeeping equipment which could carry European foulbrood into Western Australia. While Commonwealth Laws allow the importation of honey and some hive products into Australia, all honey and hive products can not be imported into Western Australia because the state legislation, the *Beekeepers Act 1963*, overrides the Commonwealth laws and prohibits their importation. Pasteurised honey⁷⁵, refined beeswax and royal jelly may enter

⁷⁴ The section of MAF responsible for this biosecurity prior to the establishment of Biosecurity New Zealand in 2004.

⁷⁵ Pasteurisation involves heating the honey to a core temperature of 65°C for at least 8 hours.

Western Australia subject to risk assessment, health certification and, where appropriate, laboratory testing. Foods or health products containing honey, pollen, royal jelly, propolis and other hive products are restricted and subject to risk assessment prior to entry to Western Australia. Unpasteurised honey, honeycomb, unprocessed beeswax, pollen, bees, used hive equipment, used beekeeping appliances, queen bees, queen cells, packages (live bees in a wooden box), or other hive products are prohibited entry into Western Australia.

- Signs alerting travelers that honey and associated products can not be brought into Western Australia are in place at domestic and international airports. Detector dogs are trained to find bees, honey and other hive products at all Western Australian entry points. Dogs and x-ray machines are also used to detect illegal imports at all post offices that receive overseas or interstate mail. Since the ban on imports of live bees, honey products and equipment was introduced in 1977, none of these items have been detected entering the State by post.

These natural border and imposed border controls were verified by Biosecurity New Zealand during a technical tour in March 2006.

10.4 The New Zealand Beekeeper Industry Group requested information pertaining to safeguards to ensure state of origin labelling.

Biosecurity New Zealand response

The query about state of origin labelling has been addressed through the addition of the following clauses in the import health standard:

7.1 This import health standard covers the importation from Australia of foundation beeswax and raw beeswax, honey, pollen, raw propolis, and royal jelly. These bee products are eligible for importation as long as the consignment meet all conditions of this import health standard, and the following labelling requirements:

7.1.1 Pasteurised honey which has been subject to the heat treatment listed in clause 1.1.2 shall be clearly labelled identifiable as being a product of Australia.

7.1.2 Unpasteurised honey which has not been subject to the heat treatment listed in clause 1.1.2 shall be clearly labelled identifiable as being a product of Western Australia.

7.1.3 All other bee products shall be either clearly identifiable as having been either irradiated in Australia or being a product of Australia.

7.1.4 The products shall be commercially packed in the original unopened packaging.

10.5 The New Zealand Beekeeper Industry Group requested information pertaining to Western Australia's surveillance programmes.

Biosecurity New Zealand response

Western Australia currently operates two active surveillance programmes for honey bees: the National Sentinel Hive Programme; and the Western Australia Bee Pest and Disease Surveillance and Monitoring System. In addition, Western Australia has an effective system for passive surveillance.

- **National Sentinel Hive Programme**

Sentinel hives in the seaports shown in Figure 2 of this review of submission are inspected quarterly for varroa, tropilaelaps and tracheal mites, and *Apis cerana*, respectively. The absence of Asian honeybees, and varroa, tracheal, and tropilaelaps mites are confirmed by log traps with pheromone lures in targeted locations, and the addition of acaricide strips in hives for 24-48 hours in conjunction with sticky boards placed on the bottom board of hives, respectively. Specimens are then sent to the Department of Agriculture Animal Health Laboratory. These specimens include external parasites collected from sticky boards placed on the bottom board of the hives for 24-48 hours, and 100 adult bees collected from each hive. Sweep-netting of bees in these port areas is done to detect any imported Asian honeybees, and there is also a requirement for the captains of all vessels to check their ships and cargo for exotic bees before reaching Australian waters. The sentinel hives and associated flowers in the port areas are also visually examined for the presence of exotic bees which may carry exotic pests and diseases.

- **The Western Australia Bee Pest and Disease Surveillance and Monitoring System**

This started in 2005 and will occur annually in addition to the National Sentinel Hive System. One hundred and twenty apiaries were visited by the state department of agriculture apiary officer in 2005, and 937 hives were inspected. As the Western Australian bee industry is much smaller than New Zealand's, this survey meant that apiaries belonging to more than 50% of the commercial beekeepers were sampled for American foulbrood, European foulbrood, exotic mites and pests⁷⁶. Only eight cases of American foulbrood were confirmed. All tests were negative for European foulbrood, exotic mites and other exotic pests. In addition, there are random inspections of hives done by Apiary Inspection officers of the Agricultural Protection program who have been trained to recognise bee diseases, and beekeepers are also encouraged to submit combs showing signs of brood diseases for inspection and diagnosis by the Western Australia Department of Agriculture Animal Health Laboratory

⁷⁶ There are 914 beekeepers in Western Australia. The majority of which are amateurs owning fewer than 50 hives. About 80% of WA beekeepers have less than 100 hives. 39 apiaries were inspected from beekeepers with 30-50 hives. 46 apiaries were inspected from beekeepers with 50-150 hives, and 35 apiaries from beekeepers owning over 151 hives.

- **The Passive Surveillance Programme**

This is based on requirements in the *Beekeepers Act 1963* that all brood diseases of bees, including European foulbrood that are found or suspected must be notified to the Senior Apiculturalist (including submission of diseased brood comb and four larval smears to the Animal Health Laboratory). An average of about 10 suspect cases per year are submitted by beekeepers and subjected to laboratory diagnosis.

Figure 2: Location of Sentinel Hives in Western Australia



10.6 The New Zealand Beekeeper Industry Group requested auditing of Australia’s biosecurity (border control and surveillance) by New Zealand officials and Biosecurity New Zealand to conduct post arrival tests and audits on product imported from Australia to determine the level of undetected non-compliance.

Biosecurity New Zealand response

Biosecurity New Zealand is confident that the Department of Agriculture, Forestry and Fisheries (DAFF) meets its obligations as a fellow member of the OIE⁷⁷ and operates as a veterinary administration under the *OIE World Organisation for Animal Health Terrestrial Code 2005*, and that the veterinary service the Australian Quarantine Inspection Service can officially certify that bee products meet the requirements of the import health standard.

⁷⁷ OIE World Organisation for Animal Health is the international standard setting body for animal health. Information about the OIE and its terrestrial code (which covers honey bee pests and diseases) is available online at http://www.oie.int/eng/en_index.htm

As a veterinary administration and veterinary service, DAFF and AQIS have their own auditing system. Therefore, post arrival testing of product and auditing of Australia's export certification system by Biosecurity New Zealand is unjustifiable.

10.7 The New Zealand Beekeeper Industry Group asked for information about the countries that Australia is importing from and their import conditions so we can assess the risk of pests and diseases being present in product imported from third countries.

Biosecurity New Zealand response

Importation of honey from a third country and re-exportation into New Zealand is not an issue, as the conditions of the import health standard for bee products from Australia exclude honey imported from third countries. Bee products must be certified as either having originated from an Australian state or territory, or having been irradiated in Australia.

The country assessment for Australia assumed that imported bee products could have been imported from any country in the world and could be infected with all of the hazards identified in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). Therefore, the level of irradiation required for this product is that which will mitigate the risk from all of the hazards identified in the risk analysis.

10.8 The New Zealand Beekeeper Industry Group asked for more information about the American foulbrood inspection and expresses its concern that the level of qualification of Australian inspectors and Pacific Island inspectors is inadequate. NZBIG recommends that the inspectors should be trained to the same standards as New Zealand's 'Authorised Persons' who undertake domestic inspections. NZBIG also asked for more information about the American foulbrood inspection and the methods that would be used to inspect hives, such as visual inspection or testing, and whether Biosecurity New Zealand will be auditing this inspection to determine the probability of undetected non-compliance.

Biosecurity New Zealand response

American foulbrood inspection of Australian hives will be done by the state or territory government apiary officers who are highly trained and knowledgeable about the differential diagnosis of American foulbrood. This level of knowledge is equivalent to New Zealand's accredited persons who undertake Biosecurity New Zealand's honey bee surveillance programme. They will visually inspect the brood frames of the hives. Honey samples will be collected according to state/territory government protocols and *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2003). This inspection and sampling is in addition to any surveillance carried out by the state or territory government apiary officers.

Biosecurity New Zealand will be negotiating with Pacific Island officials later this year and will require these countries to develop a training programme to ensure that each exporting Pacific Island country has appropriate government apiary officers who can differentially diagnose bee diseases and certify continued freedom from disease.

10.9 The New Zealand Beekeeper Industry Group expressed its concern that the risk analysis does not adequately assess strain variation in American foulbrood. The New Zealand Beekeeper Industry Group points out that it is not known what strains of American foulbrood are present in New Zealand, Australia or the Pacific Islands, and that this information needs to be established as the introduction of more virulent strains will have a detrimental effect on the American Foulbrood Pest Management Strategy. The New Zealand Beekeeper Industry Group strongly recommended that more research be done on this issue.

Biosecurity New Zealand response

The risk analysis does assess strains of American foulbrood – on page 58 it is stated that there are no reports of strains of *P. l. larvae* with differing pathogenicity. As no strains have been reported elsewhere in the world, no further assessment is required of the strains in New Zealand, Australia or the Pacific Islands or in any other countries.

10.10 The New Zealand Beekeeper Industry Group contended that for spore testing to be effective we need to know how American foulbrood distributes itself in honey (e.g. whether it sinks, floats or clumps together) so that there can be requirements to mitigate the risk of inaccurate (fluctuating) results. The New Zealand Beekeeper Industry Group requested that the sample rate be established (e.g. one sample per tonne or one sample per shipment) and included in the import health standard.

Biosecurity New Zealand response

State and territory government officials have considerable experience spore testing honey and have developed sampling protocols to detect single spores of American foulbrood so that the infection can be traced back to individual hives and apiaries. Samples are submitted to Animal Health Laboratories which are accredited by the National Association of Testing Authorities (NATA). These state and territory government animal health laboratories use the test described in detail in the sub-committee's standard, *Australia and New Zealand Standard Diagnostic Procedures – Honey Bee Diseases* (2003). As the Australian and New Zealand Standard Diagnostic Procedures are consistent with listed in the *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*⁷⁸ it will use the sampling methodology specified in this manual⁷⁹. This methodology requires samples to be sufficient so that there is at least a 95% probability of detecting American foulbrood infection in each apiary.

10.11 The New Zealand Beekeeper Industry Group asked for additional information about Pacific Island biosecurity such as:

- **the import conditions of these countries;**

⁷⁸ The *OIE World Organisation for Animal Health Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* is available online at http://www.oie.int/eng/normes/en_mmanual.htm

⁷⁹ Information about the OIE World sampling is available at http://www.oie.int/eng/normes/mmanual/A_00011.htm

- **disease surveillance and methods to detect an early detection of an incursion;**
- **how New Zealand will be checking product once it arrives in New Zealand; and**
- **how New Zealand will be auditing their border control and surveillance.**

Biosecurity New Zealand response

Over the next year, Biosecurity New Zealand officials will work with officials from the Ministry of Foreign Affairs and Trade (MFAT), Niue, Pitcairn Island, Samoa, Solomon Islands, Tonga and Tuvalu to develop an implementation plan to ensure that honey bee product imports can be managed under the recommendations of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004).

Biosecurity New Zealand will ensure that it has a high level of assurance that government officials from these countries can certify that the honey bee products meet the requirements stated in the draft import health standard for bee products from specified Pacific Island countries. No final import health standard will be issued for honey products from specified Pacific Island countries until the implementation plan is completed for each country.

The first step in the process of developing the implementation plan will be an assessment of each country's honey bee health status. AgriQuality Ltd⁸⁰ assessed the honey bee health status of Niue and Samoa in preparation for the changes to New Zealand's import health conditions.

A draft report on Samoa's honey bee health status has been recently completed and indicates that Samoa is still free from American foulbrood, European foulbrood, bee louse, small hive beetle, *Varroa* species mites and *Eugarroa* species mites⁸¹. Biosecurity New Zealand is waiting on the results of a similar report on Niue's honey bee health status, but is assured that Niue like Samoa has an enviably high honey bee health status. The honey bee health status of Pitcairn Island, Solomon Islands and Tuvalu will also need to be re-assessed in a similar manner as part of this implementation plan. The next step will be to ensure that the government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases and approve a system for auditing each countries surveillance programme.

10.12 The New Zealand Beekeeper Industry Group asked whether irradiated food products are allowed to be imported into New Zealand.

⁸⁰ The Government agency authorised by Biosecurity New Zealand under the Biosecurity Act 1993 to oversee surveillance and to provide eligibility documentation for export certification for honey bees, bee genetic material and bee products.

⁸¹ This report outlines a survey of 294 of Samoa's beehives out of the national total of 467 hives and the survey was completed by AgriQuality Ltd. This report states that a *Bee and Bee Product Prohibition Order* was issued in 1999 under the *Customs Act 1977*. This report also provided a plan for the training of Samoan government officials so that they will be able to differentially diagnose endemic and exotic honey bee pests and diseases.

Biosecurity New Zealand response

Although irradiation is considered to address biosecurity concerns in imported bee products, permitting irradiated food to be imported into New Zealand or not is a food safety issue, and therefore the responsibility of New Zealand Food Safety Authority.

However, Biosecurity New Zealand is aware that the irradiation of food is subject to the *Australia New Zealand Food Standards Code. Standard 1.5.3 Irradiation of Food* which prohibits irradiation of food unless specific permission is given. The draft import health standards have two clauses to inform importers that there may be additional regulations relating to food safety. The first clause is clause 2.1 which states that:

Commercial consignments of products imported into New Zealand for human consumption must comply with the Food Act 1981. These requirements are independent of the import health standard requirements and are managed by the New Zealand Food Safety Authority (NZFSA). Importers are advised to consult the NZFSA website: www.nzfsa.govt.nz/imported-food/index.htm or contact the NZFSA.

The second clause is note 4 following clause 7.3 which states that:

Irradiated foods intended for human consumption are not eligible for import into New Zealand unless they have been through a pre-market safety assessment process conducted by the Food Safety Association of New Zealand. Further information is available from the New Zealand Food Safety Authority website at <http://www.nzfsa.govt.nz/consumers/food-safety-topics/food-processing-labelling/food-irradiation/index.htm>.

This note explains the need for a pre-market safety assessment and if importers look at the website link they will see that bee products are not listed as one of the irradiated foods eligible for import into New Zealand. Honey bee products incorporated into medicines and nutraceuticals, such as pollen capsules, are not defined as foods and may be eligible for import. Importers should contact the New Zealand Food Safety Authority NZFSA to check the eligibility status of any bee products as this status may change.

10.13 The New Zealand Beekeeper Industry Group expressed concerns that inadequate precautions are being proposed to keep Small Hive Beetle (*Athena tumida*) and Bee Louse (*Braula coeca*) out of New Zealand as findings in the *Risk Analysis* were based upon research done on related species and not the actual honey bee.

Biosecurity New Zealand response

In the absence of specific information, the recommendations in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) were made by making reasonable deductions from information on closely related species. Biosecurity New

Zealand is satisfied that this fulfils its obligations under the *Biosecurity Act 1993*⁸² and the *World Trade Organisation Sanitary and Phytosanitary Agreement*⁸³.

10.14 The New Zealand Beekeeper Industry Group questioned whether the risk from hitchhiker beetle infestation during transit has been considered for bulk extracted honey and raw beeswax or propolis. As product or packaging can easily become infected after packaging and treatments, controls on how the product is packaged, handled and transported are essential as part of an import health standard.

Biosecurity New Zealand response

Small hive beetle exhibit a strong attraction to broodcomb and a mild attraction to honey. They do not exhibit attraction to honey once it has been packaged into clean drums or shipping containers of honey.

Figure 3 includes a photo taken of the typical packaging used to export bulk extracted Australian honey during a technical tour in Western Australia. The honey is packaged into large plastic inner containers which are surrounded by a metal grate to reduce the possibility of spillage. These containers are easily cleaned and inspected.



Figure 3: Photo Taken at Wescobee Packing Plant in Western Australia during the Biosecurity New Zealand Technical Tour March 2006

In regard to raw pollen and propolis, the clause relating to freezing will be modified to the following prior to the import health standard being issued:

⁸² The *Biosecurity Act 1993* is available online at http://www.legislation.govt.nz/libraries/contents/om_isapi.dll?clientID=138914307&infobase=pal_statutes.nfo&jump=a1993-095%2fs.22&softpage=DOC&wordsaroundhits=6#JUMPDEST_a1993-095/s.22

⁸³ Information about the *World Trade Organisation Sanitary and Phytosanitary Agreement* is available online at <http://www.biosecurity.govt.nz/strategy-and-consultation/strategy/international-agreements/sanitary-and-phytosanitary-sps-agreement>

If the product is raw beeswax or raw propolis, the product has been subject to the following risk management measures for hitchhiker organisms: freezing at -18⁰C or below for at least 7 days and have been maintained in a frozen state during shipment.

This amendment will mean that the risk of any hitchhiker beetle being present during transit will be mitigated.

10.15 The New Zealand Beekeeper Industry Group strongly recommends that the current draft import health standards be put on hold while more research is conducted into areas where there is currently a lack of information and recommends that an independent review of the submissions given in relation to the Import Risk Analysis: Honey Bee Products, December 2004 be undertaken, to ensure all concerns are given their due in a transparent and non-biased manner.

Biosecurity New Zealand response

The legal responsibility for issuing import health standards under Section 22 of the *Biosecurity Act 1993* is the Director-General of MAF. This is done on the recommendation of a Chief Technical Officer who must consider:

- the likelihood of any organisms being brought into New Zealand
- the possible impact on New Zealand of any imported organisms
- New Zealand's international obligations.

The process by which these matters are considered is Import Risk Analysis. MAF has played a leading role internationally in the development of Risk Analysis methods, and the methodology used by Biosecurity New Zealand, including international expert peer review, ensures transparency and lack of bias.

Differences of opinion that remain between Biosecurity New Zealand and stakeholders are not related to interpretation of scientific information but rather to differences in the perception of risks and their acceptability, and in particular different views on how precautionary decision makers should be in the face of imperfect scientific information. Biosecurity New Zealand does not consider that an "independent review of submissions" on the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products (2004)* would add anything new or result in a change in the decisions that have been made.

Biosecurity New Zealand is satisfied that the decisions reached by following the established Risk Analysis process in this case deliver a level of protection that is not inconsistent with that achieved by standards for other animal products such as milk products from countries or zones with foot and mouth disease.

10.16 The New Zealand Beekeeper Industry Group recommends that the assessing of *Paenibacillus alvei* as a saprophyte of honey bees (and not a hazard) be reassessed in

light of experimental evidence (not opinion) that was not included in the Risk Analysis. It also recommends that Biosecurity New Zealand reassess its stance on *P. alvei* having the capability to infect honey bee larvae without the presence of European Foul brood, and expresses its concern that beekeepers would not be able to visually differentiate the symptoms of *P. alvei* and American foulbrood out in the field and that this would lead to a detrimental effect on the American foulbrood Pest Management Strategy (PMS) which would violate the Biosecurity Act 1993.

Biosecurity New Zealand response

Biosecurity New Zealand is satisfied that the evidence in the scientific literature and international expert opinion supports the conclusions in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004) that:

- *Paenibacillus alvei* is not a primary pathogen of bees;
- *P. alvei* is a saprophyte that invades bee larvae killed by European foulbrood; and
- in the absence of European foulbrood, *P. alvei* does not confuse the diagnosis of American foulbrood.

10.17 The New Zealand Beekeeper Industry Group strongly recommends that Biosecurity New Zealand does not rely on heat treatment as a reliable risk management measure in relation to European Foulbrood, as the group it is concerned with the reliability of the scientific evidence in the Risk Analysis.

Biosecurity New Zealand response

Although Biosecurity New Zealand is confident that the recommended heat treatment to deliver a 6D (or million-fold) reduction in organism numbers means that the risk of European foulbrood being introduced in imported honey is negligible, it should be remembered that a whole chain of events would have to take place for European foulbrood to become established in New Zealand, and heat treatment is only one of the obstacles in the way (albeit an important one).

- Step 1: Honey would have to contain European foulbrood bacteria (many honey samples from European foulbrood-infested regions show no measurable sign of this disease when tested).
- Step 2: Some bacteria must survive the heat treatment process.
- Step 3: The honey is shipped to New Zealand, but not consumed by humans.
- Step 4: The honey is exposed to foraging bees.
- Step 5: A bee actually collects one or more bacteria and returns with it to the colony.
- Step 6: The number of bacteria is adequate to start a new European foulbrood infection.

All of these steps would have to occur for a new infection to result. While the heat treatment is a key step in the process, tiny numbers of surviving bacteria are not in themselves necessarily going to start a European foulbrood infection. If that were so, then European foulbrood would already be in the country as a result of the illegal importation of honey, which undoubtedly occurs.

Each year Biosecurity New Zealand confiscates several tonnes of honey products from arriving travelers, and Biosecurity New Zealand knows that some slippage occurs despite the strongest border measures in the world being applied. This honey will not have been subject to heat treatments such as those required in the IHS, and it is therefore likely to be a million times more infectious than honey imported according to the requirements of the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). The fact that New Zealand does not yet have European foulbrood highlights the significance of the steps 3-6 above.

- 10.18 The New Zealand Beekeeper Industry Group points out in its submission a drafting mistake where Part B section 7.1.7 refers to returned New Zealand honey being eligible for biosecurity clearance provided an inspector has no reason to believe that the honey is of NZ origin. NZBIG considers this should be amended to read “...is not of New Zealand origin”.**

Biosecurity New Zealand response

Agreed. The import health standard will be amended accordingly prior to issue.

- 10.19 The New Zealand Beekeeper Industry Group asks in its submission that the 2% honey, pollen or royal jelly threshold for composite products should address the issue of how much sugar is in the rest of the product. Whilst there may be a very small amount of honey in the product, the New Zealand Beekeeper Industry Group states if there is sugar contained in the product as well, this will make the product attractive to bees and cause the same risks as if it were honey.**

Biosecurity New Zealand response

Biosecurity New Zealand acknowledges that the New Zealand Beekeeper Industry Group is correct that it is the percentage of honey, pollen, royal jelly and sugar that makes a product attractive to bees. However, given the variety and quantity of processed products that contain honey, Biosecurity New Zealand needed to adopt a 2% threshold from the HortResearch investigation on the attractiveness of honey sugar water. It was decided that this level would be feasible and that asking for permits all products containing any honey would be impracticable.

When the import health standard for specified bee products from all countries is issued, importers will be required to send information about processed composite products containing 2-50% honey to Biosecurity New Zealand for an assessment. The types of processed products which contain honey are usually heat treated to levels that exceed those in the *Biosecurity New Zealand Import Risk Analysis: Honey Bee Products* (2004). These products include cough syrups, tea flavourings, marinades, alcoholic drinks, fruit

beverages, baked items, cosmetics as described in the definition of composite products in the draft import health standard for the importation of specified bee products from all countries. Biosecurity New Zealand will consider the sugar content of the composite products when an assessment is made.

10.20 New Zealand Beekeeper Industry Group requests in its submission that the spore count method is added as an option in the final import health standard for the Pacific Islands unless there is a particular reason why this has not been included.

Biosecurity New Zealand response

The Pacific Island countries do not have easy access to internationally recognised government animal health laboratories that could undertake the spore counts. Biosecurity New Zealand has also decided that the requirement for each exporting hive to undergo a full annual inspection for American foulbrood provides greater assurance that the Pacific Island country is free from the other diseases and pests of concern to New Zealand.

APPENDIX ONE: NOSEMOSIS DUE TO *NOSEMA CERANAE* IN HONEY BEE PRODUCTS

18th June 2006

SUMMARY

Nosemosis is a ubiquitous disease of honey bees which has been assumed to be due to the parasitic microsporidian *Nosema apis*. Recently the presence of the closely related species *N. ceranae* has been detected in European and Taiwanese bees by new molecular techniques. The two organisms are not readily distinguishable without such techniques. *N. apis* is present in New Zealand and is not under official control but *Nosema ceranae* is not known to be present in this country.

A causative relationship between the observed syndromes, increased colony loss and decreased honey production, and the presence of the new organism has not been established. It is considered unlikely that the introduction of *N. ceranae* will be responsible for increased levels of Nosema disease in New Zealand. However, due to the uncertainty present, the likelihood of release is considered non-negligible for honey, pollen and royal jelly and therefore risk management measures are recommended for these products.

HAZARD IDENTIFICATION

Hazard identification for *Nosema apis* can be found in section 38.1, p. 142 of the *Import risk analysis, Honey bee products*.

New Zealand Status

Nosema apis is present in New Zealand. New Zealand does not have *Apis ceranae*, nor does it import bees, honey or equipment, so there is no pathway for introduction. There are no reports of unusual Nosema disease events despite the stress of the recent spread of varroa mite. For these reasons New Zealand can be assumed free of *N. ceranae*.

Nosemosis is no longer listed by the OIE, however guidelines for laboratory testing are found in the 2004 Manual (OIE, 2004).

World situation

Nosemosis occurs throughout the world wherever honey bees are kept, and until 1996 when *N. ceranae* was discovered in China (Fries, 1996) it was thought to be due to *N. apis* in both *A. mellifera* and *A. cerana*. At that time *N. ceranae* was assumed that it was specific to *A. cerana*, and that it had a similar epidemiology in *A. cerana* as *N. apis* had in *A. mellifera*. It was only the recent development of molecular techniques that provided clarity; Rice, (2001) confirmed *N. ceranae* in *A. cerana* in Java, and *N. ceranae* has also recently been isolated from *A. mellifera* in Asia and Europe.

***N. ceranae* spores have been detected by PCR from one *A. mellifera* colony in Taiwan, a country in which *Apis cerana* is present.**

In Taiwan Nosema disease has been assumed to be caused by *N. apis* based on microscopic examination. In their recent work (Huang et al, 2004) sequenced an isolate from a sample of *A.*

mellifera in a colony, finding it to be *N. ceranae*. This provided evidence that *N. ceranae* could infect *A. mellifera* under normal beekeeping conditions, but it was not known if transmission was via native *A. cerana* or via other infected *A. mellifera*.

***N. ceranae* has been isolated from Spain, Italy, Germany and France; countries from which *A. cerana* is absent.**

A PCR was recently developed in Spain to improve diagnosis of Nosema in response to an increase in detection of spores in Spanish honey bees (Higes et al, 2006). *N. ceranae* was detected in *A. mellifera* samples from 11 of 12 regions of Spain that were tested, indicating that *N. ceranae* is widespread and common in that country. It has been suggested that unexplained increased winter colony deaths and reduction in honey production reported in Mediterranean countries in recent years should be investigated to determine if there may be a link to *N. ceranae*. Colonies in Bavaria and North Rhein-Westfalia have also tested positive to *N. ceranae*. *N. ceranae* has also been isolated in France and Italy.

There are historical reports of other microsporidia in both European and Asian honey bees based on morphological observations of spores using light microscopy. (Higes et al 2006).

Epidemiology

Bees become infected by ingesting spores from faeces, especially during grooming and comb cleaning (Bailey and Ball, 1991). Two reservoirs of infection in a colony are therefore live infected bees and deposits of viable spores on or in wax. Spores are also found in honey and robbing of honey from weak colonies is believed to spread disease (Fries, 1993).

Seasonal factors causing bees to defecate inside the hive are most important in determining the severity of disease (Fries, 1997). Such factors include hive nutrition, pollen supply, inclement weather and stresses from other infection such as varroasis.

In faecal droppings, spores may retain their viability for more than 1 year. Spores may also remain viable for up to 4.5 years in dead bees. The survival time of spores in honey is uncertain. The relative importance of faeces, honey and dead bees as reservoirs of infective spores is not fully understood and it seems that temperature may have a marked effect on the rates at which spores lose viability, regardless of their medium. It is likely that faecal contamination of wax, especially in combs used for brood rearing, or other hive interior surfaces, provides a sufficient inoculum for *N. apis* to be successfully transmitted to the next generation of bees (OIE, 2004).

The lifecycle of *Apis cerana* is similar to that of the western honey bees, and like *Apis mellifera* it is used in apiculture with modern moveable comb hives. *A. cerana* colonies comprise significantly fewer bees than *A. mellifera*, and their lower honey yields mean they are being rapidly supplanted by imported *Mellifera* races (Milner, 1996).

***N. apis* and *N. ceranae* are closely related and can only be definitively distinguished with sub-microscopic or molecular methods**

Nosema ceranae and *N. apis* are both group IV Microsporidia (Keeling & McFadden, 1998). Spores of *N. ceranae* are described as smaller than those of *N. apis* and there are fewer polar filament coils. As these organisms cannot be readily distinguished using light microscopy, PCR techniques are necessary to differentiate *N. apis* from *N. ceranae*.

Inactivation of Nosema by physical/chemical processes

Time temperature combinations are advised for killing spores of *N. apis* in hive equipment or tools (OIE, 2004):

- heating to a temperature of at least 60°C for 15 minutes;
- heating to 49°C for 24 hours;
- Fumigation with a solution of at least 60% acetic acid.

There is no reason to suspect that *N. ceranae* spores are more heat resistant than *N. apis* as the organisms are so closely related. It is reasonable to extrapolate the recommendations to spores of *N. ceranae*.

Irradiation of nosema cysts with a dose of 2.5 kGy prevented the development of disease (Hornitzky, 1994).

RISK ASSESSMENT

Release assessment

It is considered that the presence of *A. cerana* honey bees in a country increases the likelihood of infection of *A. mellifera* honey bees with *N. ceranae*.

It is reasonable to assume that the spores of *N. ceranae* would be transmitted in a similar manner to *N. apis* in *A. mellifera* colonies. Bees become infected by ingesting spores. Since spores may survive in faecal deposits for more than a year, transmission may occur via any bee products that may have been contaminated with faeces.

Honey stores in heavily infected colonies are believed to contain spores (Fries, 1993). As soiled comb is a known route of infection the likelihood of release for honeycomb is non-negligible.

There is no published data on the presence or absence of *N. apis* or *N. ceranae* spores in extracted honey, and survival time of spores in honey is uncertain. As the likelihood of transmission by bees ingesting extracted honey is unknown the likelihood of release is assumed to be non-negligible.

Beeswax considered in the MAF risk analysis is produced by melting and holding at at least 60°C for 2 hours. Propolis, as considered in the risk analysis is chemically extracted for manufacture into powder or tincture. Spores of *N. apis* may be killed on hive equipment or tools by heating to a temperature of at least 60°C for 15 minutes (OIE, 2004) and there is no reason to expect *N. ceranae* spores to be more heat resistant. Therefore the likelihood of release of *N. ceranae* in beeswax and propolis is considered to be negligible.

The likelihood of release is considered negligible for beeswax and propolis as defined in the risk analysis, and non-negligible for honeycomb, honey, pollen, royal jelly and venom.

Exposure assessment

In order to become established in honey bee colonies, bee products contaminated with *Nosema ceranae* would have to be fed to, or be attractive to, adult bees. Therefore the likelihood of exposure is non-negligible for commodities that are attractive to bees.

Venom is not attractive to bees and there is no indication for feeding these products to bees. However, venom can be added to products that are attractive to bees and therefore the likelihood of exposure is negligible provided it is packaged for direct retail sale.

The likelihood of exposure is considered non-negligible for honeycomb, honey, pollen, royal jelly, but it is considered negligible for venom packaged for direct retail sale.

Consequence assessment

Notwithstanding the speculation, primarily in Spain, that *N. ceranae* may play a role in increased mortality, there is a experts differ over the significance of the finding of the new isolate. In particular the conclusion that the effect of the new isolate is any different to the classic disease is questionable (Ritter, 2006; Fries, 2006). In limited infection experiments undertaken in 1995 *N. ceranae* infections developed quantitatively similarly to *N. apis* infections in *A. mellifera* worker bees (Fries, 2006). It is considered unlikely that the introduction of the “new” strain of nosema into New Zealand would be responsible for increased levels of nosema disease.

Risk estimation

Due to necessary steps in manufacture the likelihood of release for propolis and beeswax is negligible. The likelihood of exposure is negligible for venom, however the likelihood of exposure for honeycomb, honey, pollen and royal jelly is considered non-negligible.

Due to the uncertainty regarding the consequences of infection the risk estimate for honeycomb, honey, pollen and royal jelly is non-negligible.

RISK MANAGEMENT

As the risk is considered to be non-negligible for honeycomb, honey, pollen and royal jelly, risk management measures are justified for this commodity from countries known⁸⁴ or suspected⁸⁵ to be infected with *N. ceranae* in order to reduce the risks to an acceptable level.

These measures will be considered temporary until further information becomes available. In particular, the possibility of a survey of Nosema in New Zealand will be explored. If New Zealand freedom can be demonstrated the measures will become permanent.

Option evaluation

Risk management objective

The objective is to effectively manage the risk of *Nosema ceranae* by ensuring that imported honeycomb, honey, pollen and royal jelly do not harbour the organism when given a Biosecurity clearance in New Zealand.

⁸⁴ Known infected countries are those where *Nosema ceranae* has been positively identified.

⁸⁵ Suspected infected countries are those that import bees, bee products or equipment from countries where the Asian honey bee (*Apis cerana*) is present without treatment that inactivates Nosema spores.

Risk management options

It is reasonable to extrapolate the recommendations of inactivation of *N. apis* spores to spores of *N. ceranae* in honeycomb, honey, pollen and royal jelly.

Spores may be killed by:

- heating to a temperature of at least 60°C for 15 minutes.
- heating to 49°C for 24 hours.
- fumigation with a solution of at least 60% acetic acid
- gamma irradiation with a dose of more than 2.5kGy.

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APPENDIX TWO: COPIES OF FULL SUBMISSIONS

Department of Conservation submission dated 10 February 2006

Department of Conservation comments on the draft Import Health Standards for the Importation into New Zealand of specified bee products from: All Countries; Pacific Island Countries; Australia

Thank you for the opportunity to comment on these import health standards. Please note we have no comments on the IHSs from All Countries or Australia. We have provided comments below on the IHS from the Pacific Islands. There may be a greater risk of introduction of exotic organisms from the Pacific Islands because of the low level of entomological knowledge on remote Pacific Islands and the reliability of communication channels and diagnostic services for rapidly reporting and identifying exotic organisms.

Department of Conservation comments on the draft Import Health Standard for the Importation into New Zealand of specified bee products from Pacific Island Countries

(1) Risks to native bees and other native insects

We note that consideration of the risks to native bees and other native insects was given for all the organisms on the pest list that are not in New Zealand, and for those that are in New Zealand but for which you are requiring measures, e.g., *Varroa destructor*.

We agree that it is unlikely that these organisms will affect native bees or other native insects due to: the organisms being specifically adapted to *Apis mellifera*; the fact that many of the diseases are spread because of the crowded nature of life in a honey bee hive; and because there is contact between the generations of honey bees. The same situation does not apply to native bees as they live as solitary individuals.

(2) Biosecurity risks on Pacific Islands and reliance on the knowledge of the Official Veterinarian or Official Certifying Officer

Our concern with this import health standard is the reliance on the Official Veterinarian or Official Certifying Officer to know that European foulbrood, bee louse and the small hive beetle are not present anywhere in their country. We question the level of entomological knowledge on remote Pacific Islands and the reliability of communication channels and diagnostic services for rapidly reporting and identifying exotic organisms.

(3) Measures in the IHS

If the statements on country freedom for European foulbrood, bee louse and small hive beetle cannot be relied on, then there are no measures for these organisms in particular

bee products, therefore increasing the risk that these organisms may be introduced to New Zealand.

There are no measures for drums of honey, to which the adult small hive beetle may be attracted after processing. It is acknowledged that this is possible in section 30.2.1.1 of the risk analysis. Freezing for 24 hours is a suitable measure or other suitable measures such as heating, repackaging and cleaning are described in the 2.1.1 of the IHS for bee products from Australia.

There is no mention of royal jelly or the need for it to be frozen or dried in the IHS. In section 30.2.1.4 of the risk analysis it suggests that the small hive beetle could be present if the product isn't be frozen or dried. We suggest that measures be specified for royal jelly in the IHS.

Four weeks isolation from contact with bees is recommended to prevent bee louse in comb honey. We note that in the IHS only 2 weeks isolation is required and although this is long enough for the small hive beetle it is not a long enough time to ensure freedom from bee louse.

Comments provided on behalf of the Department of Conservation by:

Dr Barbara Brown
Deputy Chief Technical Officer

Brian Lancaster submission dated 19 February 2006

Brian Lancaster
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Re Review Import Risk Analysis
Honey Bee Products

I would like to bring to your attention the MAF response to my first submission regarding imports.

The MAF response to 1.1 pg. 6 states.

Without continuous selection pressure for resistance in the form of antibiotic use, the persistence of these strains could reasonably expect to be limited.

As this is supposed to be based on science, I would like to see this statement backed by fact, including trails, before our industry is subjected to this assumption

MAF response to 1.2 on page 6

Using area freedom in a country that allows the feeding of OTC is not allowing the full extent of any AFB infections to be present at all times. The feeding of OTC for EFB?AFB masks the signs of clinical AFB without removing the spores, which re-infect.

An AFB infected hive showing visual signs; once treated with OTC will stop displaying those visual signs for some time. As stated in the MAF response spores in honey is primarily a result of spore growth of infected larvae. As you can see from the previous sentence the damage is already done, millions of spores could have been produced before OTC is applied, however once applied the visual symptoms are no longer present for some time. AFB spores are a time bomb waiting to go off. Any spores that are in a hive tend to be spread around the hive with general housekeeping and constant movement of bees. It must be remembered that spores last up to 40 years and it only takes 10 spores fed to 1 larvae to start an infection. Another concern is robbing. Unless an area is controlled by law what is to stop hives entering that area that haven't been inspected and/or treated. Unless that area has a data base tracking and inspecting these hives, how can it claim area freedom? The problem with this approach is that it extends our Bio-security borders to another country that is out of our control.

MAF response to 1.4

States that this pathway is hypothetical.

What? How do MAF envisage honey arriving in NZ?

I would like to explore this further with a few scientific answers .6D reduces number of organisms 99.9999%

How many organisms are likely to be in –?

1 250 gm pack?

2 500 gm pack?

3 1kg pack?

4 30 kg plastic pail?

5 200 litre drum?

All these are pathways for honey.

If anyone of these containers was compromised anywhere in the country all bees within 3km radius would take all available honey back to their hives. It is the colony of bees that will become infected not individual bees. Under this scenario 1 spore in any one of the above containers will be enough to start an infection of EFB because it will be taken back to a hive to start that infection. How can this possibly be acceptable risk as stated my MAF.

Thanking you for accepting this submission

Yours truly,

Brian Lancaster

Apiarist

Canterbury

Lorimers' Honey Limited – Hillcrest Honey Submission Dated 19 February 2006



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Introduction

Hillcrest Apiaries has been in existence since the end of the Second World War, and Tony and I are second generation beekeepers. We are a commercial enterprise that currently runs over 1,000 honeybee colonies. The family have always been politically involved with the National Beekeepers' Association. Tony has spent time on the Executive (6 years) in the past, and I am currently the Association President in my second elected term.

As President, my main areas of concern has been to maintain our relative bee disease free status, and to capitalise on our 'clean green' image to maintain and increase our exports as our Industry viability relies on the ability to compete on the world market seeing as we are a net exporter of bee products. Coupled with this of course is a concern about the country's Biosecurity Strategy (or lack of one in the past) to keep out unwanted organisms and to detect and eliminate any incursions.

We maintain that there are many areas within the Risk Analysis which we are unhappy with the conclusions drawn and will continue to lobby against the importation of bee products.

Submission on Import Health Standards

The Import Health Standards

Three IHS's have been drafted and we will make comment on all three.

1 Bee Products from all countries:

Covers composite products – containing honey, pollen or royal jelly, and encapsulated medicines for human consumption and trade samples of honey.

- 1 They must comply with the Food Act 1981
- 2 They must comply with the Animal Products Act 1999

If less than 2% no permit is required but must meet eligibility requirements
If greater than 2% must be assessed by MAF before issuing a permit – up to 50% bee products – be it honey, pollen or royal jelly.

Case against the IHS:

- a) We oppose this IHS on the principle that we do not support their decision to draft generic IHS, because of the changing disease status throughout the world which means product could come into the country before an IHS was amended. Each IHS should be drafted on a case by case basis when a country has asked to export product to New Zealand and should be at their cost.
- b) Where permits are issued we argue against these being valid for up to 12 months – We believe this period is too long a time in which the disease status could have changed. We would suggest that permits only be valid for up to 2 months.
- c) Products included under this IHS should also **not contain any added sugar** - it is the total sugar content that determines the products attractiveness to bees. Until this is changed in the IHS, we oppose the IHS as it stands. Very important for the composite bee products – section 7.1.2 and 7.1.3

Form for requesting a case by case assessment of a composite product containing at least 2% Honey Pollen and Royal Jelly

Question 16: does not make sense – needs to be changed before IHS is issued.

If people responsible for writing and reviewing the drafting of the IHS can not get the document right before being released, it reinforces the fact that there is always the ‘people error factor’ in everything.

Where people are responsible for signing documents to say that product has undergone the required treatments there is a potential for them to get it wrong and a new disease be introduced via imported product.

It still concerns us that once legal imports are introduced into New Zealand that may have undergone treatments to make the risk negligible that the public will then bring in similar product that has not undergone treatment. This becomes very high risk to the industry. There will need to be a significant publicity campaign to outline that bee product imports are illegal unless they have undergone specific risk management measures to reduce disease risk – this campaign should be at the cost of the Government.

2 Specified Bee Products from Australia

IHS covers: Foundation beeswax, raw beeswax, honey, pollen, raw propolis and royal jelly.

- 1 They will not require a permit but,
- 2 Will require a zoosanitary certificate

a) Origin of consignment should not only have the address of the processing premises and registration number, **it should also have the details of the origin of the product making up that consignment. Possibly a signed certificate of State of Origin from the producer.** This may help to prevent product being shipped from one state of Australia across to Western Australia and then exported with the minimum of treatment to ensure product safety with respect to bee diseases etc

We do not believe that there is sufficient interstate border control to prevent bee products that have not undergone the required treatments from crossing to Western Australia and then exportation.

We argue that the veterinary officer who signs the certificate is unlikely to have a good knowledge of bee diseases and risk management measures, so is likely to sign document without checking that the conditions have been met.

To add to this we would like to know what the details of the surveillance programme are to enable a declaration of area freedom. Also like to know what the audit procedures are and the frequency of these.

Until these are supplied we argue against the issuing of this IHS.
Veterinary Certificate:

b) section 1.1.1 How is Western Australia determining area freedom – what is the surveillance programme and what are the reporting requirements to ensure prompt reporting of disease found? Unless there is a robust system in place this should not be one of the risk management measures.

c) section 1.1.2 the use of heat treatment as a means to manage this risk as by BNZ's own admission the heat treatment does not kill all EFB spores and also the minimum infective dose is not known. Allowing in product that may have live bacteria is not acceptable to us.

d) section 1.1.3 – irradiation with at least 15kGy. New Zealand product is not allowed to be irradiated, therefore should not be used for imported product. Does irradiation penetrate to the core of the honey in the container? Proof needs to be supplied that this treatment will work irrespective of the container size.

Until these questions are answered with references, we recommend that the HIS is not issued and imports of bee products do not proceed.

e) section 1.2.1 - freedom from American Foulbrood – inspected by an approved apiary inspector within the previous 12 months and found not to be clinically infected.

We argue that clinical symptoms can show up from 21 days, so the 12 month period is too long. New Zealand beekeepers are required to inspect and report AFB within 7 days of finding clinical symptoms. Therefore this does not show equivalence.

Also with Australia feeding OTC for control of EFB, this masks symptoms of AFB - colonies may still have AFB bacteria present and as has been raised in the past – are there different strains of AFB in Australia?

f) section 1.2.3 Where is reference that proves core temperature of 120 degrees C for 24 hours is sufficient to kill AFB spores.

g) section 1.2.4 Irradiation of product in New Zealand is not allowed and therefore should not be allowed for product from Australia.

h) section 2.1.1 and section 2.2.1 with regards to small hive beetle and bee louse – we ask what their surveillance programme they have in place to detect these unwanted organisms to enable them to declare area freedoms. If surveillance and reporting requirements are not in place this does not give New Zealand beekeepers good assurance that product entering the country will indeed be free from these unwanted pests.

We ask that these questions are answered with references given before the IHS is issued and imports proceed.

In Addition:

We also suggest that there should be a declaration of the use of OTC and other chemicals in accordance to label instructions, to ensure that there are no residues in product.

Also more importantly for New Zealand that there is some form of proof of use of OTC a number of weeks prior to harvest of products to ensure minimum likelihood of high level of spores being in product just prior to export – would also help to keep residues to a minimum.

3 Specified Bee Products from Pacific Island Countries

- 1 Includes: Nuie, Pitcairn, Samoa, Soloman Islands, Tonga and Tuvalu
- 2 Includes Foundation beeswax, raw beeswax, honey, pollen, raw propolis and royal Jelly.
- 3 No permit required
- 4 Must have zoosanitary certificate

a) Origin of the consignment should also have the country of Origin for the producers of the product.

b) We note that the number of Pacific Island countries has been extended to what had been previously allowed to export to New Zealand.

c) We argue that the veterinary officer who signs the certificate is unlikely to have a good knowledge of bee diseases and risk management measures, so is likely to sign document without checking that the conditions have been met.

To add to this we would like to know what the details of the surveillance programme are to enable a declaration of area freedom.

Also we ask what the audit procedure is and how frequently audits will be carried out on the certification process to give us assurance that certification is being conducted correctly.

Arataki Honey Ltd, Rotorua Division Submission Dated 20 February 2006

Ministry of Agriculture and Forestry
Biosecurity New Zealand

SUBMISSION RE: IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS FROM ALL COUNTRIES, AUSTRALIA AND THE PACIFIC, ALSO THE RISK ANALYSIS.

The establishment of what is an acceptable risk is a very difficult matter. In this case we believe it should be influenced by the need for the product to be imported into New Zealand and the possible effects on honey bees, human health and livelihoods.

If we allow imports of bee products into New Zealand under the conditions set out in the above, the likelihood of European Foulbrood becoming established in our beekeeping industry would be very high. This would seriously detrimentally affect New Zealand beekeeping. The effect on New Zealand's prosperity would be even far greater, with substantial lowering of beehive numbers and the great lessening of pollination of food crops and clovers which help so greatly in fixing nitrogen in our soils.

But the really big risk is the direct killing of New Zealanders by the importation of the mutating Bird Flu Virus, H5N1, in Bee Products. Birds and bees have a natural close affiliation. Birds and bees sip nectar and collect pollen from the same flowers, sometimes even at the same time. Propolis is collected by bees, from trees where birds have perched for the night and some birds even eat honey bees.

The Bird Flu viruses are dynamic and are continually evolving. When H5N1 gains the capacity to spread easily from person to person, we will be in real trouble. This is most likely to happen in Asia. We think it will be very difficult for you to establish the parameters of what is acceptable in the amount of Bird Flu H5N1 virus that is in the honey, because the virus is constantly changing. But we feel the importation of bee products into New Zealand should be banned now because when the virus starts killing thousands of people it will be too late to put controls in place.

Beekeeping is often carried out by small farm holders particularly in countries like Asia where fowls and beehives are kept on the same property. The beekeeper will feed brood from beehives to the fowls (particularly drone brood), then put the fouled combs back into the beehives. Birds very commonly nest in boxes of honey combs before they are put onto beehives. The nest is just normally pulled out, and then combs placed onto hives. Sometimes contamination can be somewhat more direct with birds sitting on the side of a honey tank or buckets and nature taking its normal course, Plop! And sometimes birds will fall into honey tanks and buckets and of course they get stuck there. The honey, which always has pollen in it, could be exported to New Zealand and the MAF authorities would know nothing about these natural occurrences and testing would not be likely to pick this up as contamination could be variable throughout the product (same applies for EFB).

The extracting of honey in many countries is carried out in primitive unhygienic conditions compared with New Zealand - in the open, with no health and safety controls, using pots and

buckets to put the honey in, could well be on the side of the road. Even Australia may well have some primitive extracting plants. They certainly used to have extracting plants on dirt floors and they used galvanised drums and we are concerned at rumours that inspecting apiaries for bee diseases on some official documents means checking the bee sites from the roadside and not checking inside the beehives. We do not have faith that certification of overseas countries are of sufficient standard to keep EFB out of New Zealand.

Has a study been carried out on the quantity of the bird flu virus that is required to be eaten by humans from imported honey, to make them infected? I suspect it will be somewhat difficult to establish, but I also suspect nil contamination of bird flu virus in any bee product imported into New Zealand would be the only acceptable aim for most New Zealanders.

I cannot find any good scientific evidence on the amount of EFB spores one would find in honey, say, from Australia, or how many EFB spores is required to infect hives in New Zealand. But the effect of losing a few hundred million dollars of kiwifruit crops etc is nothing, compared with the risk of half a million people dying from the introduction of bird flu virus with imported honey from, say, China. This could destroy governmental authorities' credibility and the government that allowed this to happen. Why take the risk!

Re: Specified Bee Products From Australia:

- 1.1.1 ...M.pluton has not been reported in this State.
What makes you think, if it was there, it would be reported?
- 1.2.1 ...Inspected within the previous 12 months.
Disease status can change in 12 months – irrelevant
- 1.2.4 ...Irradiated with at least 10kGy
Is it legal to sell foodstuffs in New Zealand which have been irradiated with nothing on the label?
- 2.1.1 ...Tumida has not been reported in this State
Once again, they have nothing to gain in reporting it. It would probably restrict bee exports to Canada if they did.
- 2.2.1 Once again, if it were there, would it be reported? Should be removed
- 2.2.3 ...Comb honey has been heated to at least 50 deg C for a minimum of 24 hours.
You cannot do this to comb honey. It would no longer be comb honey as the wax would separate from the honey at this temperature. 43 deg C is the maximum temperature.
- 2.3 Does this freezing at -18 deg C or below for at least 7 days, kill all hitch hiker organisms? I believe not.
e.g. AFB and EFB

It is well known that Australia imports Chinese honey and Australian and Chinese honey have been blended and exported to Canada; that Chinese honey is not all true honey, some is analog honey and very hard to detect, produced by feeding sugar to beehives; that there has been major drug problems over the years with Chinese honey; and that Australia uses drugs to control bee diseases which would be unacceptable if found in honey exported to New Zealand.

All are very serious reasons for not allowing the importation of honey into New Zealand from Australia. The effect of cheap sugar contaminated honey being allowed into New Zealand would destroy the NZ beekeeping industry, including its free pollination services, just as it is currently doing in Canada and the USA. Almond growers are unable to find sufficient hives for paid pollination of their crops.

Import Health Standard For The Importation Into New Zealand Of Specified Bee Products From Pacific Island Countries

Seems to be somewhat inadequate as the controls of imports of Bee Products into the listed countries may be less than the controls of imports for the same products into New Zealand.

See 1V Veterinary Certificate:

- 1.1 ... Have never been reported in this country.
This does not say that they are not there and also does not cover all diseases and pests of bees or other organisms that are not wanted in New Zealand, which could be carried by these bee products. This is not acceptable.

Now we come back to establishing what an acceptable risk is. We don't really need the importation of bee products; after all we have a surplus of most bee products produced here, which are produced under Health or NZFSA standards. I would recommend that we should be running extremely low risk levels of accidental importation because the stakes are so high. It could devastate New Zealand. The risks suggested are unacceptable. To allow additional bee products to enter New Zealand, at least until very full research is carried out into EFB spores in honey and the level that is required to cause EFB in NZ bees – and the same applies to other viruses. The bacteria *Paenibacillus alvei* that will come in with the honey with EFB spores in it, is also another risk. The risk is unacceptable. This is liable to detrimentally affect our Pest Management Strategy for AFB as it will be extremely difficult to determine whether the brood is affected by this bacteria or AFB. But by far the major one is the Bird Flu.

Keep alive; keep bee products out of New Zealand.

Russell Berry
Managing Director
Arataki Honey Ltd, Rotorua Division
20 February 2006

Central South Island Ward of the NBA Submission Dated 20 February 2006

Members of the Central South Island Ward of the National Beekeepers Association (NBA) are extremely concerned at the possibility of importations of bee products that may have a detrimental effect the health of our beehives and ultimately the effect on sustainable beekeeping with follow on effects to the wider agricultural community. As practical beekeepers we also acknowledge our practical knowledge of the treatment of bee products altogether with any assurance from the technical people leaves us with serious concerns that unwanted organisms can be kept out of this country if importation of products is undertaken.

Our members are also concerned at the procedure undertaken with the Import Risk Analysis (RA) of Honey Bee Products and the Review of Submissions associated with this risk analysis. Biosecurity Act, Sec 22 (5) (b) states the chief technical officer must have regard to.. ‘the nature and possible effect on people, the New Zealand environment, and the New Zealand economy of any organisms that goods of the kind or description specified in the import health standard may bring to New Zealand’

Ministry of Agriculture and Forestry (MAF) response to submitter’s views which, in the eyes of the submitter and others pose a risk to the NZ environment, and the NZ economy has been;

“This is beyond the scope of the risk analysis...”

The summary of the RA states;

“Many submitters raised issues that were beyond the scope of the RA, such as the economic effects of imports on the local beekeeping industry”

Our members reject limitations on the scope of the RA to cover only the local beekeeping industry. A greater benefit of beekeeping is the pollination services (paid and unpaid) which are undertaken by bees and beekeepers. Any detrimental effect on bees is likely to be compounded throughout the wider agricultural sector.

MAF have hidden behind a “scientific approach” as per the sanitary and phytosanitary agreement (SPS) without giving regard to neither the NZ environment nor the NZ economy.

It would appear that there are three draft IHS which differ in content, notably there is a differing standard accepted by MAF Biosecurity for the bee products from Pacific Island, Australia and the rest of the World (All countries). There are also notable differences in the eligible commodities covered in the IHS. Australia imports bee products thus area freedoms and differentiations may not be appropriate.

This submission applies to all IHS and comments are specifically referred to the IHS for Australian Honey as this is an area where the NBA members see an immediate threat of an introduction of disease or pests and it appears the most liberal of the IHS drafts developed.

Standards of Australian Beekeeping:

The control and treatment of existing bee diseases American Foulbrood (AFB), European Foulbrood (EFB) differ greatly between NZ and Australia. The Animal Products Act 1999 introduced a standard of hygiene (Risk Management Program (RMP), Good Manufacturing Practice (GMP)) for NZ exporters. There is no evidence to suggest the Australian beekeepers have a commitment to honey bee health and food production standards similar to those which exist in NZ. We see it as being inconsistent with our standards to allow exporters of Australian honey to meet lesser standards than those existing in NZ.

New Zealand beekeepers have a Pest Management Strategy (PMS) for AFB which specifically prohibits the use of antibiotics to treat or mask the symptoms of AFB. The IHS for Australian honey provides for importation based on the premise that hives have been inspected and found not to be clinically infected or suspected to be clinically infected with *Paenibacillus larvae larvae*. By the use of the “either or” in the Veterinary Certificate (IHS) it is possible for infected beehives to be treated with antibiotics prior to the inspection date. This will undoubtedly mask the clinical symptoms of AFB to the extent that a veterinary certifying officer may be able to “get round any AFB issue”.

Australia also imports honey. The integrity of the Australian honey exporters was placed in jeopardy when it was discovered that “Australian” honey contained residue levels of antibiotics when tested in Canada. Further investigation found that the Australian honey also contained honey from other countries (Argentina). The integrity of the officials who signed any veterinary certificate would be under scrutiny if this practice is common in Australia.

In a study conducted in 2005 by M Hornitzky it would appear that AFB sampling for oxytetracycline (OTC) resistance indicated that a Victorian beekeeper had honey with an AFB OTC resistant strain similar to Argentine OTC resistant strains. Although NZ does not feed antibiotics the distressing issue here is that it would appear the Victorian hives have been infected with Argentine AFB. NZ policy of eradication of AFB is compromised if imported honey does not have a spore count at an equivalent level as NZ honey. To date the RA talks about infective dose and does not address the equivalence issue nor presumably has there been any sampling work carried out to establish a “base line AFB spore loading for NZ honey”.

The study also recommends that imported honey samples be cultured for *Melissococcus pluton* (the cause of EFB) to determine whether resistant *M. pluton* strains have been imported into Australia. This begs the question why does Australia not have controls which would take into account the possibility of further importation of EFB and how can Western Australia give assurance that imported honey, or honey from eastern Australia, is treated to exclude EFB thus maintaining their integrity for EFB freedom claims.

If the methods of treatment for bee products are appropriate then it can be assumed that imported bee products are suitable to be used by beekeepers as “feed” for bees. (Honey and pollen are the natural feed for bees). The beekeepers need to know what the actions for redress are if imported products are shown to be responsible for the introduction of a disease which we do not have in NZ, or a disease which is under legal control (AFB).

Conclusion

Our members are concerned that the Import Risk Analysis did not consider many aspects of importation of bee products and did not consider that bee diseases have spread (and continue to be spread) world wide where a trade in bees and bee products is undertaken (even with controls).

MAF Biosecurity have given no assurances that an unwanted organism can be identified in a NZ beehive in a time frame which would assist in an eradication attempt. There is no surveillance program for NZ beehives conducted by personal experienced in overseas diseases.

MAF have given considerable weight to World Trade Organisation (WTO) and SPS agreements to facilitate trade. MAF, Govt, beekeepers and the wider agricultural community need to make sure that the benefits attained from trade can be sustained. Imports of harmful organisms could easily erase such gains. It must be remembered that a country's first line of defence is prevention and that prevention is always less costly than eradication.

The responsibility to keep NZ free of pests and diseases rests with MAF Biosecurity. It has been seen that many pests and diseases come into this country mostly through the trade in commodities. Despite their best efforts of health standards and border inspections, there are always a few organisms which escape the controls. Beekeepers and the wider agricultural community's need assurances that protocols will keep pests and diseases out and if they do "turn up" in NZ MAF will carry out its responsibility in reversing a situation which has been allowed to happen because the controls imposed have been inadequate.

To give the reviewers of this submission an impression of how imported honey may find its way into a NZ beehive I have included a photo in which I smeared some honey on the inside of a "honey container" and exposed it to the environment (similar to a housewife discarding a honey pot in the rubbish) bees were attracted to the container and will return to their hive with a load of honey and whatever pests or diseases it contains.

ROGER BRAY
CANTERBURY BRANCH CHAIRMAN,
CENTRAL SOUTH ISLAND WARD.
NATIONAL BEEKEEPERS ASSOCIATION

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Reference; Australian Government, Rural Industries Research and Development Corporation
Oxytetracycline sensitivity of *Paenibacillus larvae.subsp. larvae* isolates
By M Hornitzky, Jan 2005; RIRDC Publication No 05/021

Comvita New Zealand Limited Submission Dated 14 February 2006



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Pre-Clearance Directorate Biosecurity New Zealand
Ministry of Agriculture and Forestry PO Box 2526
Wellington
imports@maf.govt.nz

Attn: Sally Aitken

14.02.06

Dear Sally

SUBMISSION ON IMPORT HEALTH STANDARDS: BEE PRODUCTS

Comvita New Zealand Ltd wishes to make a submission regarding the importation of royal jelly slurry.

Royal jelly capsules and royal jelly and evening primrose oil capsules are core products for Comvita New Zealand Ltd. We contract out the manufacturing of these capsules. Having these capsules manufactured in New Zealand to Comvita's specifications means we have increased control over process and specifications. This includes the ability to carry out regular audits of the manufacturing and quality control processes.

We are aware of the serious threat of introduced pests and diseases to New Zealand's bee industry, and very much support efforts made to protect the industry.

Insufficient quantities of royal jelly are harvested in New Zealand to fill Comvita's needs.

The import risk analysis: Honey Bee Products 15 December 2004 states that attractiveness to bees is an important consideration in the risk analysis. Fresh royal jelly is considered attractive to bees. The powder is considered a risk because as it absorbs moisture it becomes attractive to bees.

The Review of Submissions Nov 2005 states the consultation process will review "... issues of science surrounding likelihood..."

Our supplier currently imports royal jelly powder in a slurry. This form is considered to have reduced attractiveness to bees, the carrier preventing the rehydration of the powder and rendering the royal jelly unattractive to bees. The nature of the slurry also prevents widespread contamination in the case of a spill.

Our supplier is a registered transitional facility that works under strict pharmaceutical GMP standards. Tight traceability, sampling, process control, and environmental control standards are adhered to. All sampling and processing is done in GMP approved areas. These areas are air controlled and sealed from the outside environment. Any waste is disposed of in a documented and approved manner.

As such the risk of bees accessing the slurry is negligible, and it is unlikely that bee diseases will be introduced into New Zealand through importation of royal jelly powder in this form.

Comvita endorses the submission made by our supplier, and hopes that the above factors will be considered when making decisions on the draft Import Health Standards.

Yours sincerely
Sharon Seager
Regulatory Affairs Manager
Comvita New Zealand Ltd

M.A. Pollard submission dated 16 February 2006

M A Pollard
1 Whatawhata Road Dinsdale
Hamilton

16 Feb 2006
Sally Aitken
Biosecurity New Zealand
Ministry of Agriculture and Forestry
PO Box 2526
Wellington.

Dear Sally Aitken,

Here are my submissions on the draft import health standards;

- Import Health Standard for the importation into New Zealand of specified bee products from all countries, dated 22 December 2005.
- Import Health Standard for the importation into New Zealand of specified bee products from Australia, dated 22 December 2005.
- Import Health Standard for the importation into New Zealand of specified bee products from Pacific Island countries, dated 22 December 2005.

My thanks to yourself, Robyn Hampton, and Martin Van Ginkel, for making information available to me. I am most interested to see what others have to say about the draft Standards and would be most grateful if you sent me a copy of any review of submissions or revised Import Health Standards that result from the latest round of consultation and comment.

Yours sincerely M A Pollard

Thank you for the opportunity to make submissions on the:

- Import health standard for the importation into New Zealand of specified bee products from all countries, dated 22 December 2005,
-
- Import Health Standard for the importation into New Zealand of specified bee product from Australia, dated 22 December 2005;
-
- Import Health Standard for the importation into New Zealand of specified bee products from Pacific Island Countries, dated 22 December 2005.

There are four technical things associated with the drafts that need work.

Section 4.2 -all drafts, Equivalence.

First, the methodology of equivalence, section 4.2 of each draft import health standard's methodology is not capable of coherent decisions about equivalence. The methods of expected utility analysis and Bayesian probability theory are offered as the best practical method for making and communicating decisions about equivalence.

Sections 5.1.2, 7.1.2.2, 7.1.3 ~1, BEEPROID ALL.

Second, the excepting of products with less than 2% bee product in them from any sanitary measures. The work cited in the IMPORT RISK ANALYSIS; Honey Bee Products (henceforth the RA) does not support the exception of these products. American foul brood can be dealt with by dilution. Dilution is not accepted as a sanitary measure for any of the other things pathogenic to bees that might be present in a composite product containing material from honey bees (Henceforth, bee material).

The exception should be removed; and replaced with a standard such that regardless of the amount of treated material a colony of bees consumed the material so consumed would be so free of material pathogenic to honey bees that the probability of their becoming infected by consuming this treated material is negligible.

Sections 5.1.3, 7.1.4.1, etc BEEPROID.ALL

Third, the suggestion that the encapsulation of honey bee products is a Panacea' to the problem of honey bee products acting as a vector for bee pathogens. The RA does not tell us if the encapsulation of bee products increases or decreases the probability of honey bee becoming infected by honey bee pathogens. True the encapsulated material while sealed is no problem to bees. The sheer ease with which encapsulated material can be distributed, may mean the probability of becoming infected is increased rather than decreased by the widespread sale and distribution of encapsulated bee material. Again, it is suggested that all the bee material used in encapsulated products is treated to a standard such that regardless of the amount of treated material a colony of bees consumed the material so consumed would be so free of material pathogenic to bees that the probability of their becoming infected by consuming this treated material is negligible. A similar point is made about the glazes and ices used on baked goods.

Section 1.1.2 Veterinary Certificate BEEPROID.AUS.

The heat treatment standard offered for M. pluton is troublesome. There are problems with the data, the methods used to get it, the analysis of it, the results produced from it and the standard derived from those results. It is suggested that the standard should be revised, an interim standard is suggested and plans for creating a robust standard are offered.

(Much is made in the submission about the need to have the raw data from which the standard was created unfortunately it did not occur to this submitter that the data, if asked for would be available. Eventually he did think to ask and was delighted to find that much of it was available and I am most grateful for the help of MAF's staff in making this material available. If it had been possible a full technical analysis would have been included with this submission, but time ran out, and in all fairness such technical works are tedious reading. The essential points though are still in place; if OLS is used then it must be accompanied by a full discussion on the behaviour of the residuals and the error term. Without this discussion it is impossible to tell if the work is any good. In making the standard the upper bound of a strict confidence interval

should be used and an extra margin should be added to account for variation not captured in the sample data, e.g. variations in the rate of heating, cooling etc.)
Minor difficulties and errata are noted and worked through in the order that they are found in the three draft import health standards.

Import health standard for the importation into New Zealand of specified bee products from all countries. (Henceforth Beeproid.all)

Comments. Section 3

Please provide a definition of "country of origin". In particular, if a bee product is made with bee material from country A, and country B and is imported from a third country, C, what then is the country or countries of origin for that product? A definition that provided guidance on this would be useful.

Section 4.2. 'The OIE methodology as interpreted by MAF is not capable of producing clear and consistent decisions about what material should be imported and under what conditions. This is purely a point of decision making technique. To make a good fist of making any nontrivial decision three things must be the courses of action must be similarly described in terms of utilities.' First, the uncertainties present in the situation must be quantified in terms of values called probabilities. Second, the various consequences of the courses of action must be similarly described in terms of utilities. Third, that decision must be taken which is expected on the basis of the calculated probabilities - to give the greatest utility.' (Lindley page vii). These points have been made to MAF before in Pollard 2005. And dismissed in the Import risk analysis Honey Bee Products Review of submissions. (Henceforth the RARS) as "... beyond the scope of the review of submissions" (RARS P 16). With respect I the points made above and in Pollard (2005) are at the heart of the Risk Analysis process.

A decision about equivalence is a decision about indifference. If two products are considered equivalent then we are just as happy to accept the risks of importing one product as we are to accept the risks of importing the other. Indifference is a basic notion and combined with the three laws of probability; convexity, addition, and multiplication provide the logical underpinning to expected utility analysis. In particular, if one accepts that decision makers can contemplate and make choices between alternatives they must have rules to see that the choices made are consistent or in the sense used by Lindley, coherent. If the rules are not followed the results may be absurd. The methodology set out in section 2.3 of the RA is troubling, especially the phrases "The OIE methodology makes it clear that if the likelihood of release is negligible for a certain potential hazard, then the risk estimate is automatically negligible..." (RA p 11).

This really is absurd as it conflates the roles played by probability and utility in expected utility analysis. If by likelihood the OIE mean probability and by risk estimate they mean the expected utility of the particular decision then there is a problem. An example will help.

Let us say we have events, uncertain events θ_j , and the probability of an event is $P(\theta_j)$; we have consequences of our decision C_{ij} and attached to these consequences are utilities, u so, $u(C_{ij})$ means the means the utility of consequence c if decision d_i is taken and if event θ_j obtains.

Let us take an example say that decision i equals 1 is to import a particular honey product. And that event j equals 1 is that the importation of that honey product that leads to a reduced amount of pollination done by feral bees.

Suppose further that we have determined that the probability of an importation leading to the spread of a disease that greatly reduces the amount of pollination done by feral bees is $p(\theta_1)$ equal to 1×10^{-3} , and that the utility of the reduced pollination is this $u(C_{11})$ equals 1×10^8 then the expected utility $1 \times 10^{-3} \times 1 \times 10^8$ equals 1×10^5 . Now, a probability of one in one thousand is not large, about the size of the probability of throwing four consecutive ones with a fair die. Is it negligible? Even if it is the utility associated with the event is large and the expected utility is moderate if not large and certainly not negligible.

Clearly, if the consequences of an event are trivial then we don't need to bother ourselves about the probability of these consequences occurring. And if the expected utility of a pair of decisions and events is trivial we need not bother with them until more information is at hand. We cannot make this decision before forming the expected utility equation, unless, of course the probability of the event is zero. Zero probability is usually reserved for things that are logical rather than practical impossibilities. Small probabilities will matter if the consequences of the events that have those small probabilities are large enough. It would be irresponsible to dismiss the product of an expected utility calculation because one of the factors in that product, the probability factor was small, the other factor maybe large.

The methods put forward:

Lindley's methods are Bayesian, and you lose nothing useful by adding them to the methods you already have. If, on examination some former decisions are found to be incoherent there are ways to fix the trouble; you can revise your earlier assessments of probability and recalculate. To make clear and consistent decisions about the equivalence of bee products or about decisions to import in general you need the methods of expected utility analysis. And because the thinking is expressed in numerate form, there is no room for vagueness and this is a great help in communicating what one thinks are the risks and consequences of any decision:

The RARS says of the OIE methodology "The methodology used is internationally recognized and well regarded". This may be, but the MAF interpretation of it may be novel.

In what ways does MAF think that bees could become infected by pathogenic material from composite and encapsulated honey bee products? The RA left discussion of this until the development of the draft import health standard so what has MAF determined? In calculating the probabilities associated with the risk of composite and encapsulated bee products what form of the multiplicative law of probability has MAF used? What was the result of the calculation and where can the calculations be found? These things are not trivial as by displaying the calculations everyone can see what MAF thinks on the topic.

We might think about how much infected honey, say, would have to be in a container for a hive to become infected under the usual range of conditions if the colony had free access to the container and the material in it, this is fairly easy for some of the pathogens in honey.

It would though, be misleading if we stopped there. We also have to think about the possibility of infection arising from all the manifold sources of infection that might challenge a colony; and how likely and how severe each possible source of infection might be, both alone, and in combination.

It is easy to dismiss the risk of infection posed by the pathogenic material that mayor may not be in a composite bee product in a capsule, that may or may not be exposed to bees, that may or may not collect pathogenic material from the exposed capsule, that mayor may not return to the hive, that mayor may not successfully signal to fellow bees that they should return with the first bee to take more material from the exposed contents of the capsule, and so on. Certainly each of the individual probabilities appear to be small and if they were all independent of one another the product of multiplying them together would be small.

Such a conclusion would very probably be false. It is not clear that the probabilities are independent, and so things are not clear cut.

"One event, E, is independent of other events if the probability of E, $p(E|H)$ is unaltered by any information concerning the other events. (H stands for history or the sum of our knowledge about events like E and those related to it) A set of events is independent if the statement in the last (unbracketed) sentence is true for each event in the set." (Lindley page 50)

Since judgments of probability are subjective what is independent in the view of one decision maker may not be independent in the view of another.

(MAF may object to my suggestion that probability is subjective or rather that assessments of probability are subjective. But they are, there are, it true, some assessments we are very sure about like those that appear in the long run and are described by classical statistics; but each time we make an assessment of probability it involves a leap, a leap of induction} a belief that our future past will be like our past pasts. "They may or may not be, we cannot be sure and so the assessment of a probability about a thing that will or will not happen in the future is a subjective assessment)

If events are judged to be independent then the multiplicative law is then for three events E_1, E_2, E_3 ; [$p(E_1 \text{ and } E_2 \text{ and } E_3) = p(E_1) p(E_2) p(E_3)$] where $p(E)$ is read "the probability of the event E occurring.

If, however the events are judged not to be independent, then the multiplicative law has a different and more burdensome form. Where $p(E_1/E_2)$ is read the [$p(E_1 \text{ and } E_2 \text{ and } E_3) = p(E_1) p(E_2/E_1) p(E_3/E_1 \text{ and } E_2)$] probability of event E_1 , occurring.

What is the point of all this? It is this, while some individual assessment of probability are subjective, the way those assessment sand later assessments of probability are fitted together is in no way arbitrary or vague or capricious they are always controlled by the three laws of probability and enforced by the use of explicit indifference and comparison.

The three laws limit what you can say about the uncertainty of a particular situation, but they also leave a lot of space for personal views.

So, are the events surrounding the risk of bees becoming infected by pathogenic material from composite and encapsulated independent events or not. Well some events at least are related. The probability that one bee becomes infected depends on the total amount of infectious material brought into a colony at one time. And this in turn depends on the success of bees in finding infectious material and encouraging other worker bees to returning to the infected material. The longer the infected material is exposed the greater the probability, and once found the probability of the colony becoming infected depends on how many other bees are attracted to the infected material. This in turn will depend on how close to the colony the infected material in comparison to other food sources. (By close is meant close in terms of work effort, as bees appear to be good at calculating efficient loads and they appear to work to rules that optimise the amount of food collected at each trip). The probability that material is feed to bees by mistake, by a well meaning but ignorant person feeding honey to native birds on the fringe of an urban rural area (think west Auckland here) and on the probability of hives being nearby. The probability that material becomes exposed will depend on how successful the sellers of composite and encapsulated bee products are at getting the public to buy them, this in turn will depend on the price charged and the amount of and quality of advertising for the products. (Here think of the 'nature bee' adds on commercial radio, IZB etc) and on the discretionary incomes of the people living in the areas where people and bees are most likely to interact. So it is unlikely that all these events are independent and until we see the calculations MAF has used in its determination of risk there is no telling if the determination is coherent of or not.

Given that dilution is offered as a treatment only for American Foulbrood and no other bee pathogen one suspects the 2% notion is not coherent. And the absence of any discussion about the amount of protection or risk afforded by encapsulation leaves one only with doubt not reassurance that MAF is right.

5.1 change "section 6"to section 7.

5.1.2 suggested change. Delete the words "less than 2%" and add the words "provided that they are accompanied with a declaration from the manufacturer stating 'that all the bee products used, in making the above product have been treated such that regardless of the amount of treated material a colony of bees consumed the material so consumed is so free of material pathogenic to bees that the probability of their becoming infected by consuming this treated material is negligible.

Comment. Where did this" 2%" rule come from?

There is in the RA a discussion about the percentage concentration of honey solution that bees will collect in preference to water alone. The conclusion being that" the lowest concentration of honey and sugar that bees collected in preference - to water was 2%" (p 4 the RA).

On page 9 of the RA both pollen and royal jelly are considered and it is thought that if they were available to bees they would be attractive to them.

None of this suggests that 98% dilution with any of the usual fillers used in commercial products makes untreated honey, pollen, or royal jelly any less infectious to bees. With the exception of American foulbrood, where dilution such that the spore count is less than half a million per litre.

Note also that the honey solution at 2% is not unpalatable to bees, they will just as easily take the two percent solution as they will water. And if some misguided person were to feed honey solution to native birds and they put 1% of honey containing say 25000 M. pluton per ml then the solution would have about 250 P M. pluton per ml and this would be rather more than we are comfortable with as a 100 M. pluton fed to a bee larvae less than a day old can be enough to start trouble under the right (for us wrong) conditions.

It is not clear where a product stated to have 1.8% honey, 1.8% and 1.8 % Royal Jelly would stand. No analysis of the risks and benefits from importing composite products containing low percentages of honey bee material is given in the RA and it is not at all clear what consideration has been given to these risks and benefits in the development of the Draft import health standard. Further given the difficulties with the methodology used in making comparisons of equivalence (see discussion under 4.2) it may be that quite incoherent decisions are being made.

Another difficulty albeit remote, is that some enterprising' seller of bee products might use the 2%' loophole' to import quite large amounts of untreated bee products and then package them for resale. If the cost of treating and certifying bee products were high it might be attractive for people to something like the following. The bee product importer could approach an importer of bulk food, something like peas and buy 2% of the weight' of a shipping container, say 2% of 20 tons. Now together they specify the imported product as 'soup mix', 50% yellow split peas, 40% green split peas, and 8.01% lentils, and say 1.98% bee pollen. Now the whole product is a composite product that conforms with the 98% rule". The bee pollen does not have to be treated regardless of what condition it is in, it is easily recovered (although a cheeky importer might put it into sacks mixed with sacks of the peas etc). The importer of the peas etc has a load 2% smaller than usual, the importer of the bee pollen has about 396 kg of pollen, that he or she can do what they like with and none of it treated. This is a foreseeable thing and the rule should be revised to stop it from happening. A suggested wording for the manufacturer's declaration is offered. What I have in mind is that any bee material imported into the country (other than returned New Zealand materials) should be treated such that the probability of that imported bee material carrying pathogens to bees is so low that it is trivial.

5.1.3 Suggestion add the words "provided that they are accompanied with a declaration from the manufacturer stating that all the bee products used in the product have been treated to the standard that/regardless of the amount of treated material a colony of bees consume the material so consumed would be so free of material pathogenic to bees that the risk of their becoming infected by consuming this is negligible.

Comments see above at 5.1.2

Note encapsulation is not a panacea.

The RARS says on page 26 that" The matter of packaging will be fully explored and addressed in the development of the Import Health Standard (s).

What investigations were made and what results were found and where can those of us interested in checking the calculation of the probabilities and utilities used by MAF find the results of your exploration?

Encapsulation is hinted at as a sort of de facto sanitary measure.

Encapsulation is no panacea. While the encapsulation is intact there is no problem; but dilution along with encapsulation and then widespread distributed may make for more spread of pathogens rather than the less efficient or negligible risk of spread that is hinted at. In particular think of M pluton, away extremes of light and heat it can survive for along time and dilution is unlikely to be a problem to it as the capsules once made are closed to air.

Perhaps the best way of dealing with 5.1.2 and 5.1.3 is to delete them altogether and include all composite products; however they are packaged in section 5.2.

If on the other hand if it is too hard to make all the necessary assessments and the cost of treating honey, pollen and royal jelly to make it safe for bees (and people of course) to consume, is cheap, it would be simpler if nothing else, to require all the material used in the bee material products to be treated.

7.1.2.1 Suggestion delete the words “less than 2%”.

Add the words “and that this material has been so treated that the probability of the material containing things pathogenic to bees is negligible”.

For the reasons given under sections 5.1.2. and 5.1.3.

It may be better to delete section 7.1.2.2 and relabel section 7.1.2.3 as section 7.1.2.2.

7.1.3.1 Suggestion, remove the words ‘cakes and bread’ from the standard. True enough material ready for retail sale is usually packaged in a way that bees or other insects cannot get at it, but once opened for consumption, the material can be discarded, perhaps in a way that bees will find it. This would be a concern if raw untreated honey with pathogens in it were used as an ingredient in a glaze or more especially in icing. Both glazes and icing are put on the baked base after the base has been baked and is quite cool. (See the New Zealand Bread Book page 101). Glazes are often boiled for a short time or simmered but they are not kept hot enough for long enough to kill all the things such as American foul brood that might be in them. And what is true of glazes is true but only more so for ices. Hot water may be used to produce a nice plastic mix but the heating is not severe enough to worry most bacteria. Honey as an ingredient in cake fillings is not unknown and in a filling a reasonable amount of honey would possible. The threat posed by the honey glaze on one bun would be trivial but we are interested in the total or cumulative probability of a colony of bees becoming infected not from one single source necessarily but from all the possible sources of infection - that might be present. It would seem easy enough to ask people to surrender this material at the border and be done with it.

7.1.3.4 Suggestion Remove the words "less than 2%"

Add the words" and that this material has been so treated that the probability of the material containing things pathogenic to bees is negligible'

For the reasons given under 5.1.2 and 5.1.3:

7.1.4.1 Suggestion add, the words "and that the shipment is accompanied by a manufacturer's declaration that \"this material has been so treated that the probability of the material containing things pathogenic to bees is negligible”.

For the reasons given under 5.1.2 and 5.1.3.

7.1.7 Suggestion, insert the word "not" after the word 'of' and before the word 'New Zealand' in the final line of 7.1.7. The not completes the double negative and the requirement, is, I, suppose that a package of New Zealand honey that has been sent back can be returned without any further treatment.

8.1 Change the words' section. 6' to 'section 7'

9.1 Change the words' section. 6' to 'section 7'

Draft import health standard for the importation into New Zealand of specified bee products from Australia. (Henceforth Beeproid.aus)

Comments Section 3 Please add a definition for Country of origin. And please use a Definition that covers blended products made with bee material (honey, pollen, Royal Jelly etc) originating in more than one country, that is to say made with bee derived material taken from hives located in more than one country .

4.2 See the comments under section 4.2 Beeproid. all.
IV Veterinary Certificate.

1.1.1 Suggestion.

Delete this section and replace it with the following.

Originate from hives that have been in Western Australia and no other state for the last year or more, and M pluton has not been reported in Western Australia. And that none of the bee products have been mixed with bee products from other states.

This emphasises that it is material from Western Australia that is acceptable. It would, for example, be unacceptable if hives were shipped from other states and the material taken from them then being laundered through a Western Australian apiary. (Given the costs of transport it seems unlikely but it is a foreseeable, if, unlikely event.) Secondly it emphasises that no mixing of acceptable and unacceptable honey is allowed unless that honey, or other bee product is being shipped through a state of Australia other than Western Australia. So Western Australian honey with a low spore count of say P.I. larvae could be used in a blended honey from say New South Wales, but things could not be done the other way round.

1.1.2 Suggestion

Rethink the methods used to get the model used to create the standard and make a new standard.

We all agree that if honey is heated enough and for long enough that a colony of bees could consume as much of that honey as it liked and not become infected by M pluton. It is not clear that the model used to produce the standard tells us what enough is.

There is much to complain about. From the methods used to get the data, to the selection of the particular model, its specification" and the inferences and the standard drawn from it. Some of these complaints are about things that perhaps should be done differently. Many of the complaints are about things that aren't there that should be there and in a discussion about a model based on Ordinary Least Squares (OLS) really must be there before a reasonable judgment of the model can be made. In particular and for future reference when you produce an OLS based model please let submitters and would be submitters see;

the original data set
analysis of residuals, any outliers and the error term
results of tests for multicollinearity, autocorrelation and
heteroskedasticity

This is the bare minimum list. (I am mindful that Murray says that it is to I keep any statistic" to a minimum (Murray p 183)

The last point, heteroskedasticity is often a problem in pooled data and it is a further problem as heteroskedasticity affects the estimates of variances. In particular it may invalidate the results of tests of significance and lead us to underestimate the true variance of the OLS estimator. In short our confidence intervals will be too short. This leads to another point that of variance, or rather several unrelated things that in the construction of the data and in the analysis of the data reduce both the actual amount of variability in the data, and the amount of variability reported from the data. Of course neither of these things reduces the variability in the true data, nor the variance of the population parameter c^2 . In constructing a heat treatment regime one would think that the finding of the population variance for the resistance of M. pluton to being killed by heating would be fairly important; or rather finding a good estimate of the true population variance would be important, as we are interested in heating enough not to kill on average but to kill so much of the M. pluton, even the most resistant of it, that the risk of infection to bees eating treated honey is negligible.

It seems best to collect these otherwise scattered observations together, as if they were raised in the logical order of sample design, data, collection and analysis, interpretation and standard creation they would be easily missed. First Ball et al work is on a blend of European honeys. It is not clear that they are representative of the honeys of the world; and the results a Wootton et al. (1981) suggest stratified sampling would be better.

Second "Massaging" of the data by Ball et al. Blending the honeys together and averaging values from pairs of sample tubes each is a method for reducing the variability recovered from the data.

Third, the choice of logs, putting data in logs (in this case to the base 10) is hard for saving effort in putting in the data as, for example 1000 is log 3 and 1000,000 is log 6 but it also suppresses variability in the data and the importance of any outliers.

Fourth, the choice of the log form model, yes it allows the use of OLS, but the analysis is by computer package and good nonlinear regression packages are available. (The data would look different, to, when plotted. The uneven scales used in figure 6 of page 169 the RA produce an apparently nice straight line, the untransformed data are different they are a nice rectangular hyperbola with an odd shaped lump at the right hand tail)

Logs are convenient but they are not here, essential and even if it is just to show how good the log form model is discussion with at least one other form of model might be useful.

Fifth my understanding of this may be wrong so be patient here.

From the table on page 17 of the RAMS and the table on page 168 of the RA, it appears and page 7 of BEEPROID.AUS it appears that the 6D Inactivation time is the expected mean time not just the 6D inactivation time at a particular temperature. At first glance it makes no difference as the prediction would be the same regardless, whether we choose just the plain y_0 or the Expected value of y_0 , $E(y_0)$ but it does matter as choosing the latter produces confidence intervals that are narrower actually more tightly bowed in around the OLS estimator. This mayor may not be an advantage to us. It rather depends on how we chose to interpret the confidence intervals. So, whilst the discussion in Cox and Domijan gives a fair amount of discussion about the averages of 6 D inactivation times and thermal death times not much discussion of variance, other than confidence intervals and a discussion on the nonlinearity of 'some of the data are given matters it affects the OLS estimator, our statistics of significance and our interpretations of our results. And it affects our tests in indirect ways through the behaviour of the error term. The error terms 'picks up' all the variation that is not accounted for in our chosen parameters, so how it moves matters a lot.

The point being made is simple. Variance is important to the conclusion draw from the data we have, and the amount of reassurance that we can we he about these conclusions.

Several things, none of them obviously related have happened in the creation, processing and interpretation of the data that reduce the amount of variability recovered from or apparent from the data. Of course the true population variance is unaffected by our sampling of the population but our perceptions about the magnitude of the true variance a population might be changed, we might easily underestimate it.

The model used by Cox and Domijan is novel. The left hand side looks very like the kind of term used in first difference models and so the first question is; was autocorrelation a problem in the original data?

What have you done with the error term? The equation is a stochastic one and the error term 'picks up' all the variation not explained by the other parameters.

What have you assumed about the error term and its behaviour.

Why is t^2 used? We would not expect the upward trend to continue forever, we would think it would tail-off, which suggests a cubic is needed. It would be best to add a cubic term and test to see if the equation is better. And what were the simple and partial correlations for each of the variables, and have any important variables been omitted? Without seeing the partial correlations who is to know?

The estimated coefficients themselves are troubling. The coefficient for temperature² is near enough to zero which is not what we would expect and the coefficient temp x log time is not large at all. Putting the data in logs and thus using the absolute value of the drop in numbers is counter intuitive and sets one puzzling about what signs you really expected the coefficients to have. The obvious way to plot a 'drop' model is to put the drops not in absolute terms but in actual terms and plot using the negative values of they axis. This approach is better than using logs as it shows how the rate of decline in numbers of M pluton slows as the higher temperatures are used. Figure 3 suggests that even in logs the data are heteroskedastic. Did you find them and what problems did

this lead to, for your t values for example. Indeed, where the analysis of residuals is in particular what were the results for omitted variables.

All, the discussion of the results obtained by Wootton et al (1981), Ball et al (2001) ,and Cox and Domijan (2004) is in terms of classical statistical inference so it is worth reminding ourselves of a few basics. Classical inference is grounded on two points;

First, the sample data constitute the only information that is relevant. Second, all of the methods used to construct and assess different methods of inference are based on long run behaviour, and it is assumed that this behaviour occurs under essentially the same circumstances.

Bayesian inference is different but given the cool reception given to the submitter's suggestion to use Bayesian methods in the RA any substantial discussion of using Bayesian methods to understand and improve on the work of Ball et al will be delayed till a more appropriate time.

Both methods though make use of the ideas of Random variables and probability distributions and we will recall some useful points. A variable X is a random variable if for every real number, say a , there is a probability, denoted $P(X \leq a)$ that X takes on a value less than or equal to a . If the random variable takes on only a particular finite set of values it is called a discrete random variable. For example the numbers of a particular type of bacteria in a given amount of honey. A random variable is called a continuous random variable if it can take on any value in a certain range. For example, time. The maths of continuous random variables is easier than the maths of discrete random variables we will find it convenient to pretend that a discrete random variable can be approximated by a continuous random variable. For example the number of bacteria in a given amount of a particular honey.

A formula giving the probabilities for different values of a random variable X is called a probability distribution if the random variable is a discrete one, and a probability density function if it is for a continuous variable.

It seems that MAF is happiest discussing variability and how to deal with it through the device of confidence intervals. And to be sure if we made the confidence intervals wide enough we would be very sure indeed that we had an interval wide enough to include the true values of the population parameters we are interested in so we will pause from discussing the shortcomings of the work underlying the heat treatment standard for M pluton and make some brief points about confidence intervals and their use.

These comments are basic and the topic of confidence intervals for β_1 and β_2 simultaneously will be raised as it will lead us into a discussion. Usually we are interested in constructing a confidence interval for either β_1 , β_2 etc. Let us say we are interested in β_2 before getting a sample estimate $z\beta$.

We can construct an interval such that the true value lies in the interval $1-\alpha$ of the time, in the long run, assuming conditions are essentially alike. The interval is random as it is constructed around a sample estimate from the parameter β , that is to say, that since $z\beta_2$ is a random variable the interval constructed around it is not a random variable but rather a random interval, 'and this really matters because the probability statements made about the confidence interval applying the long run sense meaning that if we constructed confidence intervals again and again from different sample $z\beta_2$ s

using the 1-a basis then on average these intervals will be around the true value of β_2 in 1-a of the examples.

Notice we do not say that the probability of β_2 being between the set limits is 1-a, and further once we have a particular example of ${}^z\beta_2$ the interval is no longer a random one it is a fixed one; and the true value for β_2 either lies within the estimated interval or it does not. The probability that the true value of β_2 is in the interval is either 1 or zero. This must be kept in mind when talking about confidence intervals. It is also a warning about drawing inferences about the true value of the population parameter when we have rather few estimates of it.

What these confidence intervals show is interesting and disturbing.

First, as the confidence intervals reflect what happens when we consider all the regression lines for all the possible β s or rather combinations of β s in the elliptical joint confidence region for $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ it seems the data are giving problems. The slope of the regression lines is far from stable, this will give us trouble as the data is pooled data and we would like to have used dummy variables to look at the effect of heat at particular temperatures and to model the effect of different levels of pH etc in different samples of honey. Either the data need to be partitioned or if you want a model that covers all the temperatures a non linear model looks worth an attempt. The problem being that a non-linear model will most probably show that heating above say 80 degrees centigrade must be done for longer than is shown with the linear (log linear) model fitted. Second we do not know whether or not the true figure for the expected 6D inactivation time lies in the constructed confidence band or not, the thing either does or it does not. The only way we can get a feel for this probability is by taking more samples from more experiments, fitting new regression lines and confidence bands and seeing how they compare. To be sure about the probability that our confidence band held the true mean a good number of experiments would need to be constructed, Note the confidence band does not say that there is a 95% probability that the true value for the mean lies within the one band that has been constructed. That probability statement, holds only in the long run for a large number of experiments repeated under essentially the same conditions. If we don't have a lot of experiments or conditions are changing, other methods, non classical one are needed.

Third the obvious thing to do with the limited data we have is to estimate the confidence band at a much higher level. After all should like our heat treatment to work in the long run all the time. So at a minimum try plugging in a 50%, 60%, 70%, 80%, 90%, 95%, 99% and if it can be done a 99.9% limit for the confidence band just to see how the thing behaves. Fourth set the standard at something above the upper bound of the 99% confidence band. Remember, that band reflects the variability in one set of sample data for the thermal inactivation of M pluton under one (two different?) set of laboratory conditions. This leads to the bugbear of most standards derived from lab work. The standard will be used in the field and the heating and handling will be done under commercial conditions where the material is handled both in bulk and in modest amounts. And there will be variability in the way heating is done and the speed with which it is done. So the standard must have a margin, a margin to reflect variation from sources other than those captured in the experimental data.

This point is worth expanding on. Two things are especially striking about the information reported in the RA. First the data for temperatures much above 85° suggest that there is hysteresis and that it is of a higher order. And the work reported on methods of treatment using heat and

pressure suggest that the rate of heating or even the rate of change of the rate of change of heating make a big difference to the time taken to kill M pluton. So very fast heating maybe extra effective, but slow methods of heating may require extended periods of heating at a given temperature. Bacteria, if given time enough may be able to adjust themselves to quite high temperatures for quite long periods this is not good for the proposed standard's voracity.

A second point about variability. It is reported that Ball et. al started their experiments concentrations of M pluton of between 10^7 and 10^6 bacteria per ml of solution and the RA implies that this fact combined with the fact that Wooton et al, (1981) found a maximum of 3,300 M pluton margin per ml of honey provides a wide of confidence about the results of Cox and Domijan's modeling of the thermal inactivation of M pluton the RARS page 11 under point 4.16 echoes this. Another interpretation is possible; it is only a hypothesis as no work has been done on it. Ball et al had suitable methods for producing this 3000 fold increase in concentration. So would any of the methods used in handling and treating bulk honey produce similar or greater concentrations of M Pluton in the honey? No work appears to have been done on this so we do not know⁸⁶. We simply are ignorant about it there is no evidence either way. If we think the possibility utterly trivial we could ignore it or if it is thought more important we could do some sampling from honey treated and handled by commercial methods and this would reduce our ignorance and few samples would be needed if Bayesian methods were to be used.

Before discussing the possible design of any future experiments a digression on attitudes to science and scientific methods. There are two distinct things, the body of scientific knowledge as it stands at any particular time and the method of science or I more particularly, what one should do in the face of ignorance about something we would like to know about and when the body of scientific knowledge has something to say about it.

In the RA and the RARS much is made of the fact that any restrictions on importations of material and any standards for the treatment of imported material must be science based or based on science.

All this seems reasonable enough but when faced with genuine ignorance for example how much M pluton must a colony of bees X consume over what period and under what circumstances for the colony to become infected with M pluton or more particularly what is the probability density function of this random variable. My suggestion is that there is a difference of attitude between MAF and several of the submitters to the RA. MAF would say, something like the body of scientific knowledge should be used to make inferences about what is likely to be the case, and if we are sufficiently sure that the inferences are likely to be borne out in practice then all is well and things can proceed. My suspicion is that several of the submitters to the RA would agree with using the body of scientific knowledge to form inferences about what is likely to be the case, and

⁸⁶ Actually some work has been done. Ball et al tried to collect M Pluton samples from store brought honey, that had, presumably been handled and thus heated in the usual course of degranulation and softening of honey that is commercially handled. Ball et al had trouble because the growth of other bacteria interfered with the growth of M Pluton and the handled and then cultivated honey produced pleomorphic cells in clumps and rods. This suggested that honey heated and handled commercially will produce M pluton that behave differently to the single cell HAW isolate used In Ball and that the behaviour of M pluton in honey is more complex than the model of Cox and Domijan shows. Parsimony is good but fitness for purpose is supreme.

then if we are not sufficiently sure that the inferences are going to be right then we must design and do experiments to test how well our inferences and the body of scientific knowledge fit what our experiments reveal. There is, it seems, a disagreement in attitude.

The way to resolve this is simple, each should set about using the Bayesian methods available to calculate the likely value of sample information and then they should compare notes; they may not agree but if they do all is well and some experimenting can' be designed or discarded as needed. Now this, may not make the parties agree about what needs to be done but it would quantify and make clear by how much and perhaps why they disagree and this would be useful; it would in part influence the design of our experiments as the experiments must reflect what we think are the salient parts of the problem or rather the salient parts of our ignorance.

What it costs to sample honey and test for the numbers of bacteria or spores of bacteria; the submitter does not know. If the cost were low (in the tens or fewer dollars per sample) then one could design a nice pure experiment where a representative sample of honeys treated by the usual commercial methods was taken with control sample taken as, stored at room temperature and used for future reference. If testing were dear (in the hundreds of dollars a sample) a much smaller and selective sampling would be taken. Prior information would be used to select a stratified sample where what were thought to be a selection of either the most heavily infected honeys or the honeys containing strains of M pluton thought most resistant to killing by heat or perhaps the honeys with conditions such that they make the M pluton more resistant to being killed by heat (if, indeed there are such strains of M pluton or such honeys) and then treating them by commercial methods to what is thought to be the least demanding level set down in the current standard; and see if enough M pluton or spores of M pluton survive to be a problem to bees. This will be made difficult by other bacteria being present.

Another experiment might be needed to find out what is meant by 'be a problem to bees' as no work has been done on this. On the other hand if the numbers of M pluton or M pluton spores that are viable is very low after treatment we may have few worries, but to conclude this after a 6D reduction we would need to know the initial numbers of M pluton in the sample as Cerf (1977) cited in Cox and Domijan (2004) page 167 of the RA points out that he recommends that the possible number of reductions under that the curve can be studied over should depend on the size of the initial population regardless of the model employed! True, he is talking of getting calculations to achieve a 12 D reduction, a reduction a million fold more than the one contemplated in the standard. Yet the general point seems reasonable. It would be handy to know the initial numbers of bacteria or spores in a sample so that the standard used to set down the times needed to get the needed reduction could allow for all the highest concentrations of material that might be present as well as the average concentration of spores etc.

If nothing done in the commercial extraction, handling, storage, and packaging of honey increases the concentration of M pluton in honey beyond the concentration of 3,300 per ml found by Wootton et al (1981) and if nothing in the production of the honey undercultivation raises it beyond that level a 6D or perhaps a 7D reduction in the numbers of M pluton might well be enough.

The standard set will not achieve this sort of reduction. First the creator of the standard has not got the right interpretation of the work done by Cox and Domijan (2004) even if all is well with their

work (and all is not well with it) the standard as created says in effect; that we do not mind that over the long run about 2.5% of the honey subjected to heat treatment under the standard will not be treated to achieve a 6D reduction in the numbers of M pluton. If the interpretation of the treatment as being thought of as a random variable some of the honey will be untreated and under the proposed standard rather more will be untreated or undertreated than you intend.

It would seem wise to set the standard at or above the upper bound of a wide confidence band rather than the 95% band that has been used. The band itself has been set from work that is troubled. There are troubles with the design of the experiment, the collection of the data, its analysis, and its interpretation. In particular, several things have conspired to reduce the variability reported from the data and the importance of the variability that remains has either been ignored or underplayed. In particular, the effect of variability (variance) on the reliability of tests of significance. There is no discussion of the error terms in the equation; no discussion of the analysis of residuals from the equation; no discussion of the presence or absence of problems from the multicollinearity, autocorrelation, and heteroskedasticity this is not good. Further the importance of the nonlinearity in the data has been underplayed and the choice of log forms and regression limit the expression of that nonlinearity although it shows through even in plots using uneven scales, and in the confidence bands estimated from the log form

Some further work is needed. As a start, make a full discussion of the model you have and see it is the best of the available linear estimators. Then try and find a good nonlinear model that fits the data and preferably does so without the need to use logs. Then reassess the standard. Or if it is thought easier design a new experiment and collect new data and start again.

The standard, as it is published is likely to be inadequate to do what is expected of it. It is not rigorous enough. Now the standard for American foul brood is likely to be much too strong for M pluton so some sort of compromise is needed using the information already at hand; this is one possibility, there are a great many others.

Perhaps the simplest thing to do is to re estimate confidence interval at 99.9 %, take the upper bound and add a margin of fifty percent.

This, would in effect, raise the standard.

This at first appears much too severe but there is sane reason for it. First we do not know that the true population parameter for a 6D or 7D reduction in the numbers of M pluton that are viable in the honey is in our confidence interval. Second the work of Wootton et al (1981) is disturbing. Some honeys seem to contain things that help M pluton survive heat treatment. And Ball et al (2001) cite evidence that M pluton shows little genetic divers it must be something in the honey that does the buffering. We do not know what it is nor how much of it or sane other thing in honeys from countries other than Australia, that does the same thing there is. The methods used by Ball et al who added the inoculum to the honey blend just before the sample was placed in the heating bath is a little disturbing, if there is some factor in the honey that helps M pluton buffer itself against damage from heat then it may take time to acquire it.

Also the speed of heating was rapid. If the M pluton take time to adjust themselves to heat then the more rapid the heating the more effective the heat treatment at a given temperature. And the speed of heating and the rate of change of the speed of heating may make a difference as might the speed

of cooling and recall that at the end of heating period Ball et al quenched the samples of M. pluton suspension in iced water. That bacteria can adjust themselves to heat is not a surprising hypothesis. Bacteria are ancient and probably evolved when the Earth was a good deal hotter than it now is. As the Earth cooled it would be advantageous for bacteria to learn to survive at lower temperatures. When heated moderately slowly one wonders if they can somehow 'remember' how to adjust their metabolic processes to cope with heat as their ancestors had. Of course sane bacteria, the thermophiles have retained their ability to function and survive at moderately high temperatures (70 to 80 degrees C).

If any of this is right, then the standard must have enough margin to cope with this, we are after all interested in practical results. A further worry is the clumping together of bacteria, this makes them harder to kill by heating. Ball et al. are relaxed about this but they are presumptive, rather than experimental reassurances that Ball et give.

Most of these worries are just that.

The point is the standard as published must be made more strict. The standard is based on one sample that is probably not representative. We do not have good estimates of the mean and variance of the population" (i.e. the true parameters for the population mean and variance for the 6D inactivation time for M. pluton in the honeys of the world, or the honeys most likely to be imported into New Zealand) and to cope with this a standard with a wider margin of safety is most important; and some well designed experiments would be helpful too. Experiments that model the behaviour of M. pluton under the conditions of commercial heat treatment and handling of different types of honey, are indicated.

Draft import health standard for the importation into New Zealand of specified bee products from Pacific Island countries.(Henceforth Beeproid.proid.pac)

Comments. Section 3. Please add a definition of country of origin. For the reason given in the discussion of section 3 Beeproid.all above.

4.2 Please add the methods of expected utility analysis to the methods already used to judge equivalence. For the reasons given in the discussion under section 4.2 Beeproid.all above.

IV Veterinary Certificate.

1.1 add the words after the word and " that they have not been mixed with bee products from any other state and "then continue with European. . .

This emphasises that the honey etc must come from the particular country listed in the certificate. And if one were really worried about the possibility of honey being laundered through Pacific Island countries one would add "that I have taken reasonable steps to see that the bee products have not been mixed with bee products from any other state" these words could go between the second" and" and "European" of the revised version offered above.

Or more simply revise to the following.

Suggestion 1.1 The bee products originate from apiaries in.....and I have taken reasonable steps to see that the bee products have not been mixed with bee products from any other state and that European foulbrood etc. as in the rest of 1.1.

One would think that the probability of bee products being laundered through Pacific Island countries would be small, yet it is a foreseeable event and it may be just as well to craft the wording of the veterinary certificate in such a way declaration in such a way that the veterinary officer is aware of the possibility and does something to prevent the laundering of bee products through the country that the certificate originates from.

1. 2 A query I would it be wise to add the options of suitable heat or irradiation?

These things may not be wanted at the moment by the exporting country I but they might be wanted in the future. Putting them in now would keep things even with Australia and may save extra work in the future.

2.1.3 A query. Is this temperature cold enough for long enough. In particular if pollen is put in a plastic lined cardboard drum or barrel is -18 for 48 hours long enough to get the middle of the material in the drum cold enough for long enough? Powdered materials are good insulators and are poor conductors of heat what is the thermal coefficient of dry powdered pollen? It maybe useful to find this out as it would apply to both heating and freezing treatments used to sterilize pollen products.

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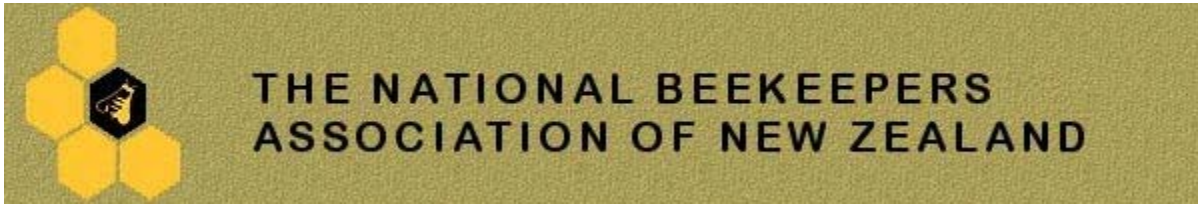
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National Beekeepers Association Submission Dated 20 February 2006



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Submission on Import Health Standards for Bee products

The National Beekeepers Association (NBA) acknowledges the opportunity to comment on the three import health standards for bee products. However, the NBA remains very concerned that the risk analysis upon which these standards are based does not provide a satisfactory level of protection to New Zealand beekeeping.

The NBA will continue to oppose the risk analysis until satisfactory levels of protection are afforded the industry and requests that no import health standards be issued until satisfactory assurances of protection are provided for. This is based on the NBA's concern for the level of disease risk, the future viability of beekeeping in New Zealand and most importantly the pollination services provided by beekeepers to the horticulture and agriculture sectors.

With regard to the three import health standards, the NBA makes the following observations and respectfully requests detailed responses to allay its concerns.

Bee Products from all countries:

The NBA:

1. seeks assurances that each IHS will be drafted on a case by case basis.
2. notes (in clause 5.2) that there is a limit of 2% honey content above which MAF will assess on a case by case basis. However, the NBA advises that the 2% level should specify the total sugar content including honey and added sugars; and that any greater content significantly increases the attractiveness to bees. On that basis, the NBA can not accept the importation of products exceeding 2% total sugar content including honey.

3. does not support the 12 month validity (in clause 5.4) of import permits issued because this period is too long and the disease status could be changed during this period. The NBA suggests that permits only be valid for up to 2 months.
4. that there needs to be consistent use of the safeguard determined in the risk analysis for heat treatment of bee products as one option for managing the risk from *Paenibacillus larvae larvae*. This has been applied in clause 1.2.3 of the import health standard for specified bee products from Australia, but should be included in all import health standards for bee products from other countries.
5. notes that in the Form for requesting a case by case assessment of a composite product containing at least 2% Honey Pollen and Royal Jelly
 - 5.1 the NBA is concerned that Question 15 will be used to permit irradiated products be sold for human consumption.
 - 5.2 that Question 16 should be amended to read “14 and 15” and not “16 or 17”.

Specified Bee Products from Australia

The NBA:

1. requests that to make the origin of consignment transparent, the certification should not only have the address of the processing premises and registration number, it should also have the details of the origin of the product making up that consignment. The NBA assumes that an auditable trail will be able to verify the State of origin and the producer. This may help to prevent product being shipped from one state of Australia across to Western Australia and then exported with the minimum of treatment to ensure product safety with respect to bee diseases. The members of the NBA do not believe that there is sufficient interstate border control to prevent bee products that have not undergone the required treatments from crossing to Western Australia before they are then exported.
2. seeks assurances that western Australia is maintaining a surveillance and inspection programme that will underpin the certification required.
3. seeks assurances that the certifying officers are sufficiently competent with a good knowledge of bee diseases and risk management measures, and that they only sign the certificates after confirming that the conditions have been met.
4. seeks assurances that there is a robust surveillance programme and reporting requirements to ensure the prompt reporting of disease so that the statement in clause 1.1.1 of the Veterinary Certificate can be accepted.
5. requests verification that the heat treatments required in clause 1.1.2 of the Veterinary Certificate effectively kill all *M. pluton* because the minimum infective dose is not known and as a result, a less than 100% kill presents an unacceptable risk to New Zealand beekeepers.

6. requests that clause 1.1.3 of the Veterinary Certificate be amended to ensure that irradiation is only applied to containers that will enable the irradiation treatment to completely kill all *M pluton*. This is to provide assurances that treatment is not certified where irradiation has not been able to effectively penetrate to the core of the honey in the container.
7. requests that clause 1.2.1 of the Veterinary Certificate be amended so that the inspection for AFB is within 7 days prior to harvest and not the currently specified 12 months. This would align it with the requirement in the AFB Pest Management Strategy for all cases to be reported within 7 days that New Zealand beekeepers are obliged to comply with. The NBA knows that clinical signs of AFB can become apparent within 21 days, so the 12 month period is too long. The current clause 1.2.1 does not show equivalence.
8. notes that clause 1.2.4 of the Veterinary Certificate will permit irradiated bee products including honey to be sold in New Zealand for human consumption. The sale of irradiated foods is currently not allowed in New Zealand except for a very narrow range of products.
9. seeks assurances that with regard to clauses 2.1.1 and 2.2.1 of the Veterinary Certificate that the Australians surveillance programmes effectively enable the declaration of area freedoms to provide the necessary protection for New Zealand beekeepers.
10. requests that clause 2.2.1 of the Veterinary Certificate be amended to read "... reported in the State of origin."
11. requests that in addition, there should be a declaration that the use of antibiotics and other chemicals has been in accordance to label instructions, to ensure that there are no residues in imported products. This includes assurances that antibiotics have not been used prior to harvest to ensure that disease signs have not been suppressed.

Specified Bee Products from Pacific Island Countries

The NBA:

1. notes that the number of Pacific Island countries (which now include: Niue, Pitcairn, Samoa, Solomon Islands, Tonga and Tuvalu) has been extended to those that previously could export bee products to New Zealand.
2. seeks assurances that each Pacific Island involved is maintaining a surveillance and inspection programme that will underpin the certification required.
3. will not accept importation where certification statements are based on a lack of surveillance information.
4. considers that the IHS should contain a restriction to ensure that products imported into any of the Pacific Islands are not re-exported with any bee products being consigned to New Zealand.

5. seeks assurances that the certifying officers are sufficiently competent with a good knowledge of bee diseases and risk management measures, and that they only sign the certificates after confirming that the conditions have been met.
6. requests that the products in each consignment should also have the country of origin clearly displayed on the product.
7. requests that clause 1.2 of the Veterinary Certificate be amended so that the inspection for AFB is within 7 days prior to harvest and not the currently specified 12 months. This would align it with the requirement in the AFB Pest Management Strategy for all cases to be reported within 7 days that New Zealand beekeepers are obliged to comply with.
8. requests that clause 2.1.4 of the Veterinary Certificate be amended to read "... for at least 48 hours."

Yours sincerely

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National Beekeepers Association Submission dated 19 May 2006

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By Fax: (04) 819 0728

New disease risk identified for imports of bee products

The National Beekeepers Association (NBA) has continued to see assurances for the diseases risks associated with the importation of bee products.

We are concerned to now learn that there is a disease that was not identified in the risk analysis. The organism involved is *Nosema ceranae*.

Can you please confirm with a report to the NBA via me to give your assessment of this disease and how any risks associated with it will be managed?

Yours sincerely

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National Beekeepers Association Letter to the Hon. Jim Anderton Minister of Biosecurity and Associated Technical Report Dated 7 June 2006

Hon. Jim Anderton
Minister for Biosecurity
Parliament Buildings
Wellington

New risk identified for bee product imports

Dear Mr Anderton

The National Beekeepers Association of New Zealand Inc. (NBA) continues to oppose the proposed importation of bee products due to the associated disease risks. Representations have been made to you about the concerns held by beekeepers.

The NBA has continued to seek assurances about the disease risks involved and on 19 May advised the Director PreClearance in Biosecurity New Zealand of a new organism *Nosema ceranae* which had not been considered in the risk assessment.

The Executive of the Association has conducted a search for information on *Nosema ceranae* and a report has now been received by the NBA and is hereby submitted for your information. This report also identifies further anomalies in the Import Risk Assessment for bee products that gives the Executive further concern with regards to the validity of the authors' conclusions.

The NBA now seeks assurance that this organism will be considered along with the other technical issues raised by beekeepers before any decision to implement new import health standards for bee products.

Yours sincerely
Jim Edwards Executive Officer

cc:

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Nosema ceranae
An exotic? microsporidian parasite in *Apis mellifera*

Report to National Executive of the National Beekeepers Association of New Zealand Incorporated

Frans Laas
5th June 2006

Foreword

I have written this short report on *Nosema ceranae* to inform the National Executive on the status of this parasite previously unknown in Europe which appears to be more virulent than the widespread *Nosema apis*. Because of the limited time I have only done an overview of the readily available information. I have written this over a single day so it is somewhat limited in its scope but most of the known published work has been included. I have made some suggestions at the end for your consideration.

Introduction

Nosema apis Zander is an ubiquitous microsporidian parasite that infests the Western honeybee *Apis mellifera* and also *A. cerana* (Rice 2001). It is responsible for widespread economic losses and mortality in managed honeybee colonies throughout the world including New Zealand. Related *Nosema* sp. also infect a wide range of insect families including other members of the family *Apidea*, *Lepidoptera* and *Orthoptera*. It is also related to the *Giardia* and *cryptosporidium* group. Until recently it was assumed that it was the only *Nosema* species infecting *A. mellifera*.

In 1999 Spanish beekeepers began experiencing unusually heavy winter mortality in managed colonies. This was attributed to Nosemosis, however the disease process did not appear to follow the normally accepted symptoms and suspicions were raised. Was it a new organism or had *Nosema* somehow mutated and produced a more virulent form? The causative organism had been examined by the usual microscopic methods and identified as *N apis*, however not all dead colonies showed evidence of *Nosema* infection. It was becoming evident that a different pattern of infection was occurring and further investigation was required. In 2005 the organism that appeared to be causing this new epizootic was identified as a previously unreported microsporidian, *Nosema ceranae*. (Higes et.al. 2006)

Nosema Ceranae

This organism was first identified in China (Fries et al. 1996) in *A. cerana*. It was thought to only infect *A. cerana*. Morphologically it is almost indistinguishable from *N apis* and the usual diagnostic tool of examining specimens under light microscopy at 400x will fail to distinguish between the two species. Reliable differentiation can only be done using molecular diagnosis of the ribosomal gene sequences. It was assumed that *N ceranae* would be endemic throughout the

range of *A. cerana*. Once it was discovered it was effectively forgotten about as it seemed logical that *A. cerana* should have its own specific *Nosema* species.

A Short History

Nosema ceranae has obviously been in existence for a long period of time until its formal identification in 1996. The question remains as to what it has been its effect on *A. cerana* and when did it first cross the species barrier and infect *A. mellifera*.

In 1972 honeybees in Taiwan became infected with *Nosema* (An and Ho 1980), however the causative organism was identified as *N apis*. Recently the SSUrNA gene of the *Nosema* species infecting *A. mellifera* in Taiwan was sequenced and found to be consistent with *N ceranae* rather than *N. apis* (Huang et al. 2005). No *N apis* was reported in this study. While this was the first report of *N. ceranae* infecting *A. mellifera* it is probably safe to conclude that *A. mellifera* had been infected since at least 1972 in Taiwan.

In 1999 beekeepers in Spain reported unusually heavy overwinter mortality in managed colonies, which was attributed to *N apis*. However there were some inconsistencies with the normally accepted symptoms and suspicions were raised. Was it a new species of *Nosema* or a mutation of *N apis*? *Nosema* appeared to have become more virulent! The rate of Nosemosis was also reported to be increasing (Martin et al. 2005)

In 2004 a formal investigation was carried out and *N ceranae* was identified as being present in 11 of 12 samples taken from adult bees from a subsample of severely infected colonies and found by microscopic examination to be positive for *Nosema* sp (Higes et al. 2006). In Spain the occurrence of nosemosis has increased from 10% in 2000 to over 88% in 2004 (Ritter 2006). The presence of *N ceranae* has also been confirmed in Germany. Increased overwinter mortality of managed colonies throughout Western Europe has been unusually high over the last European winter. *N ceranae* induced Nosemosis is implicated.

Ritter raised the following questions regarding *N ceranae*

- Where did *N ceranae* originate, although it carries the ceranae label and is associated with *A. cerana* what is the truth about its status?
- Was the organism recently introduced into Spain and responsible for the high mortality in colonies because it is more virulent as the Spanish presume?
- Has it always been present but only recently identified as *N ceranae*?
- Is the apparent increase in the virulence of Nosemosis more to do with other stress factors associated with *Varroa* and other pathogens?

Observations in Germany have noted a change in the course of the classic symptoms of Nosemosis over the last 2-3 years (Ritter 2006). The normally accepted course of the disease is chronic in its action with affected bees crawling out in front of the hive, gradual colony dwindle and lost colony productivity. In many instances the disease is not apparent. In Germany the new

course of the disease involves rapid death of the colony often with the hive full of dead bees, an acute form of infection. Bees are also making strong cleansing flights in temperatures as low as 4° C. Ritter was not able to conclude that these cleaning flights were associated with this new form of Nosemosis. Ritters' conclusions appear somewhat ambivalent towards *N ceranae* and he suggests good management of Varroa and optimal apiary sitting to be an aid in managing this new form of Nosemosis.

It is quite clear that something has changed dramatically in Europe with regard to overwinter mortality over the last few years.

Nosema Down Under

Nosemosis is also present in New Zealand and Australia and *N apis* is assumed to be the causative organism for this disease.

Australian researchers have done some work on the prevalence and effects of this disease in that country (Rice 2006, Hornitsky 2005). Rice mentions the existence of *N ceranae* and also reports infection of *A. cerana* with *N apis*. Hornitsky's review does not mention *N ceranae*.

In New Zealand Louise Malone of Hort Research has produced a wide range of publications on *Nosema*, not only in honeybees but also Bumblebees and other insect families.

I believe little research has been done on assessing the economic impacts of Nosema in commercial hives in this country. Some years ago I read a study by Ron Vantoor on work done in Otago comparing honey production in colonies treated with fumagillin compared with controls and found that treated hives had produced 30% more honey. I cannot locate this paper at present. There is probably a body of work that has been done in this country on economic impacts but is probably forgotten about.

Nosema apis is classed as a notifiable disease under the Biosecurity(Notifiable Organisms Order) 1993. However *Nosema ceranae* is not, which is understandable since it was only identified as a species in 1996.

Comments about Nosema from the Import Risk Analysis HoneyBee Products

The Import Risk Analysis: Honey Bee Products (15th December 2004) (IRA) has a list of organisms that are a potential risk to honey bees in this country. Under section 38 (pg 142) *Nosema* disease is listed. However only *Nosema apis* is recorded. *Nosema ceranae* has been recognised as a separate species for 8 years prior to the publication of IRA. Why no mention of it in the IRA? It is also interesting to note that the O.I.E. has removed *Nosema* from List B in May 2004.

The conclusion about the risks from *Nosema* in section 38.1.5 read

"*N. apis* is present in New Zealand, it is not under official control, and there is no evidence to suggest that: more virulent strains exist abroad. Therefore *N. apis* is not classified as a potential hazard for the purposes of this analysis."

This is an interesting statement. At the time of writing the IRA it was becoming evident in Europe that something was happening with Nosemosis. MAF Biosecurity's intelligence gathering should have picked this up if they were actually looking for potential threats to New Zealand's biosecurity status.

Looking at the list of references attached to the Nosema section I note that the most recent reference date for references was 1997.

Fries I (1997). Protozoa. In: Morse R, Flottum K (eds). Honey Bee Pests, Predators, and Diseases Third Edition. Pp 59-76. AI Root, Ohio

Fries was the discoverer of *N. ceranae* (published 1996, Fries is a leading authority on Nosema) and you would think that it would be mentioned in that book. Looking at the paucity of the references and some of them nearly 50 years old suggests some sloppy research on the part of the authors' who are conveniently anonymous.

I also looked at Section 41 regarding other races of bees.

"New Zealand is known to have three honey bee races - *A. m. ligustica*, *A. m. mellifera*, and *A. m. carnica*. The Italian bee is the predominate race in this country, and until 2004 the European black bee was the only other race used (Matheson, 1997). Carniolan semen was imported from Europe in the autumn of 2004 and has been inseminated into Italian queens. Husbanded colonies in New Zealand are often hybrids of the Italian and European black bees."

I note a few factual errors in this section as well. *A. m. carnica* and *caucasica* as well as some other Middle Eastern races were imported into New Zealand prior to 2004, plus the alleged illegal importations. My own morphometric analysis of Southern South Island commercial stocks indicates a surprisingly high content of Carniolan genetics in these stocks. These genes did not emanate from the 2004 introduction of Carniolan semen. The Italian bee was never the predominate race in New Zealand, it was always a variable hybrid more correctly termed an Italian Type. The reference section again is noted for its paucity and lacking of some relevant New Zealand material. More sloppy research.

Conclusions

Little is known about *N. ceranae* especially its epidemiology. The current evidence from Europe indicates a far more virulent form of Nosemosis linked to *N. ceranae*. There are many questions about *N. ceranae* but few answers. At present the only definitive thing about this organism is that it can be identified and that it can infect both *A. mellifera* and *A. cerana*.

Nothing is known about its distribution throughout the world, how it arrived in Europe or as Ritter suggests, it may have been present in Europe for a very long time and was mis-identified.

- What is its status in Australasia? The parasite is known to occur in Java and Australian researchers are aware of its existence.

- What does Louise Malone know of it as she is New Zealand's resident expert on Nosema? Is it present in and Australia New Zealand? we need to establish this.
- How viable are *N. ceranae* spores in honey?

The Biosecurity (Notifiable Organisms Order) 1993. and other relevant legislation needs to be amended to account for this new organism.

The Import Risk Analysis HoneyBee Products is now a defective document and needs to be sent back for review and amendment. Deficiencies in the authors' scholarship also need to be addressed.

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Submission on the

DRAFT IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS FROM AUSTRALIA

Peter Bray - Airborne Honey Ltd. 22 February 2006

CONTROL MEASURES FOR AMERICAN FOULBROOD

The Import Health Standard allows importation of honey from Australia on the proviso that it meets anyone of the following measures for American foulbrood:

1.2 The bee products have been subject to one of the following risk management measures for American foulbrood (*Paenibacillus larvae larvae*):

EITHER

1.2.1 originate from Australian hives that have been inspected within the previous 12 months by an Apiary Inspector approved by the state Department of Agriculture and found not to be clinically infected or suspected to be clinically infected with *P. l. larvae*;

OR

1.2.2 tested and found to have a *P. l. larvae* spore count of less than 500,000 per litre;

OR

1.2.3 subject to heat treatment where the core temperature has reached at least 120°C for a minimum of 24 hours;

OR

1.2.4 irradiated with at least 10 kGy.

American foulbrood (AFB) is a major, economically significant disease of honeybees World wide. New Zealand had major problems with AFB in the late 1800s and early 1900s that nearly destroyed the fledgling honey industry. This situation led to AFB being placed under control by the Apiaries Act 1906. AFB has subsequently been controlled under legislation in New Zealand since that date. One key part of this control is that the feeding of antibiotics for AFB has always been illegal in New Zealand but is legal (and routine) in the majority of countries in the World. New Zealand spends over \$1 ,000,000 annually on control of AFB with direct (Pest Management Strategy) and indirect costs (hive destruction, lost production/income, inspections etc). However this cost is outweighed by the benefit that New Zealand has the lowest reported levels of *Paenibacillus larvae larvae* in honey of anywhere in the World and these levels are decreasing. Consequently over the long term, the cost of AFB control will decrease as a large portion of the

control cost is the destruction of infected hives.

The 2004 **Import risk analysis: Honey bee products** (IRA) summarised much (but not all) of this information but concluded that:

For honey, pollen, royal jelly and beeswax, the likelihood of release and exposure are non-negligible, and the consequences of introduction are also considered to be non-negligible. Therefore, for these commodities the risk of *P.l.* larvae is considered to be non-negligible and the **organism is considered to be a hazard.**

The risk of this hazard is directly related to **the number of viable *P. I. larvae* spores per litre (SpL) in honey arriving in New Zealand.** A level of 500,000 SpL was set in the IRA as providing negligible risk. Only two studies for AFB infectivity have been undertaken, one in 1932 and one in 1994. These have established that it requires somewhere between 5,000,000 and 50,000,000 spores per litre of honey to start an infection. The figure of 50,000,000 was considered by the IRA as the figure to choose. A safety factor of two orders of magnitude reduction from this upper level was then applied i.e. 500,000 SpL.

Thus according to the IRA, for the risk to be negligible, imported honey has to be treated/managed such that AFB transmission is a negligible risk and this will be achieved by having less than 500,000 viable spores per litre of honey.

This produces some difficulty.

Firstly as noted in the IRA, *P. l. larvae* are very difficult to culture:

Apart from larvae and pupae of *A. mellifera*, only a few media that are rich in organic growth factors will induce germination or sporulation of *P. l. larvae* (Alippi, 1999a; Dingman and Stahly, 1983). An inoculum of many millions of spores is needed to start growth on these media (Bailey and Ball, 1991).

Calculation of Germination Rate.			
From Mark Goodwin, 9 mls water plus 1 ml with 3.3×10^5 spores germinated at one spore per plate with 64 microlitres of solution per plate.			
	spores	mls	
Honey with Spores	330,000	1	330,000
Water	0	9	0
Total Solution		10	330,000
Spores per ml			33,000
Mis per plate			0.015625
Spore per plate			515.625
Germination Rate			0.19%

The current method of culturing *P. I. larvae* for identification in honey was pioneered by Hansen and refined and used by M. Hornitzky in his work referenced in the IRA (Hornitzky 1991). Due to the low level of germination of *P. I. larvae*, this method detects down to approximately 20,000,000 SpL. The reference in Hornitzky's 1991 paper to Australia having 12.5% of honey containing *P. I. larvae* spores is therefore only measuring honey that has 20,000,000 SpL or greater (>20,000,000 SpL).

Sensitivity of AFB Culturing Test	
Minimum infective Dose (MiD)	
Spores/litre	50,000,000
Spores/ml	50,000
Spores/gm	35,286
Specific Gravity of Honey	1.417
1 ml water	1
1 gm honey=mls	0.71
total mls honey/water	1.71
micro litres solution per gm honey	1705.72
micro litres per plate	64
Parts of gm represented by total plate	0.0375
Spores per plate at MiD	1,324
Colonies per plate representing MiD at average germination	2.6
Spores per litre represented by 1 AFB colony per plate	19,472,900

There is a high probability that a significantly higher level of Australian honey tested in this 1991 study would have shown *P. I. larvae* present if the test's sensitivity was able to detect 500,000 SpL

Secondly, a control level of <500,000 SpL and a test sensitivity of 20,000,000 SpL presents the problem of just how the required level of 500,000 SpL be monitored and achieved as required in part 1.2 of the Import Health Standard (IHS):

"tested and found to have a *P. I. larvae* spore count of less than 500,000 per litre"

What "test" is being referred to here? A repeatable analytical method of sufficient sensitivity must be developed, standardized and published before any credibility can be given to an import claiming to meet this standard.

In Australia there is also a high incidence of *Paenibacillus alvei* spores in honey - often in over 50% of samples. This causes significant problems with the culturing and identification of *P. I. larvae* spores e.g. From the **July 2002 Import Risk Analysis: Honey bee hive products and used equipment**.

Each year for the last five years, New Zealand laboratories have tested 300-500 bee and honey samples for *P. larvae larvae*, the cause of American foulbrood (AFB). They have not reported the problems that have been experienced in Australia where *P. alvei*

overgrows culture plates being used for culturing *P. larvae larvae*

Hornitzky in 1993 reported using the addition of nalidixic acid to the culture plates to inhibit *P. alvei* growth. K. Antunez 2004 reported using this method but also notes:

The PCR technique used in this work was very useful for the identification of *P. I. larvae*, since in many cases the colonies could be overgrown by other microorganisms like *P. alvei* which cover all the plate

Any standardized test for detecting *P.I. larvae* at the 500,000 SpL level will have to accommodate this problem in an acceptable manner.

Additionally, while the 1991 data (12.5% honey contaminated with *P. I. larvae* at the >20,000,000 SpL level) from Australia is old and well out of date, its timing is important to consider. EFB was first discovered in Australia in 1977 and took several years to become widespread being recorded in Tasmania in 1984. The use of antibiotics (Oxytetracycline - OTC) for EFB's control correspondingly also took several years to become widespread.

It is well known that AFB spreads under the masking effect of OTC.

BP Oldroyd, RD Goodman, MAZ Hornitzky and D Chandler 1989 **"The effect on American foulbrood of standard oxytetracycline hydrochloride treatments for the control of European foulbrood of honeybees (*Apis mellifera*)"**

"The results show that recommended treatments for European foulbrood (EFB) effectively mask AFB disease, making it likely that beekeepers treating EFB also suppress signs of AFB disease if it is present. As it is common practice in Australia to treat EFB prophylactically with OTC, an escalation of AFB in Australian hives is anticipated."

Hornitzky-M Honeybee pollination in Japan, with special reference to strawberry production. Australasian-Beekeeper. 1988,90: I, 11-12; Bj.

"In further tests, positive results were obtained for 12 of 20 colonies treated with oxytetracycline hydrochloride that did not show disease symptoms."

This prophylactic feeding is further alluded to by a 2004 paper from Australia's Rural Industries Research and Development Corporation (RIRDC) **"Evaluating alternative antibiotics for control of European Foulbrood disease"** in Australia. This paper examines alternative antibiotics to OTC for EFB treatment because of the problems with continued contamination of Australian honey with OTC.

And a further RIRDC report titled "R&D plan for the Honeybee Program 2002-2007" contains the following:

"As mentioned earlier the use of antibiotics for the control of EFB is leading to the masking and therefore probable increases in AFB levels."

Australia had a rapidly changing picture for AFB treatment in 1991 when the 12.5% level of *P. I. larvae* in honey was reported. This figure represented a 280% increase in the incidence of *P. I. larvae* spores in honey over the previous 7 years. This was mostly due to the rise in OTC use for EFB spilling over to affect AFB. All indicators and research predict that this is increasing and will continue to increase to the level of other countries and regions where over 50% of honey is normally infected (at the >20,000,000 SpL level) as indicated in the IRA:

Positive tests for spores have been reported for 8% of 82 honey samples from USA and Canada (Steinkraus and Morse, 1992), 55% of 394 Argentinian honey samples (Alippi et al., 2004b), 62% of 68 Austrian honey samples (Derakhshifar, 1994) and 56% of 131 honey samples from a range of countries (Hansen, 1984).

Additionally, Ohe-W-von-der and Dustmann-JH; 1998 reported that:

"In all, 3500 samples were investigated in 1993-1996. All 62 imported honeys and 45% of the 54 samples from apiaries in other countries were contaminated with *P. larvae*"

And Tasmania which has been using OTC for AFB since the 1950s had a level of 68.4% of honey with *P. I. larvae* in the late 1980s.

This subject is so important for the control of AFB and spread of *P. I. larvae* spores in honey that New Zealand's AFB Pest Management Strategy (AFB PMS) specifically bans the use of drugs:

14. Restrictions on use of drugs---(1) No person may use any drug, substance, or mixture of substances in relation to apiaries, honey bees, appliances, or bee products that has the effect of masking, obscuring, or concealing symptoms of American foulbrood or increasing the difficulty of detecting the disease or *Paenibacillus larvae* larvae.

On this note it is extremely disturbing to see the following comment in MAF's review of the IRA submissions on page 6 - 1.2

1.2 The submission expresses concern that oxytetracycline (OTC) fed for control of EFB suppresses the clinical signs of AFB and so may result in difficulties in recognition of AFB and therefore a potential increased level of AFB spores in bee products

MAF response: Section 20.2.1.1 of the risk analysis states that although *P. I. larvae* spores are frequently found in honey, the higher the concentration of spores in honey the greater the likelihood that disease would be detected in the hives of origin. The number of spores in honey or other products is primarily a result of spore growth in infected larvae. In a hive with no clinical signs there will be few infected (dead) larvae and therefore low spore numbers. If there are no clinical signs of infection, regardless of OTC usage, the risk is considered acceptable.

This is an incorrect understanding by MAF on this fundamental point. MAF's position is at odds with the published literature on the subject along with the supporting facts. Clause 14 from the AFB PMS is in place precisely because of this issue.

The level required to be met as decided by MAF is <500,000 SpL. This level is either met, or it is not. Inspection of hives for clinical symptoms of AFB in the Australian context will give limited assurances and, taken as the only control measure, will guarantee that the control level is routinely breached.

A control practice that gives a high degree of probability that the control level will be routinely exceeded cannot be considered "acceptable".

Some Australian states have a system of monitoring *P. I. larvae* in honey for beekeepers that send in samples. Information from The Animal Research Institute at Yeerongpilly, Qld. gives the following information:

The levels of colonies germinating on a plate are graded as follows:

- 1 + category means that the number of colonies of *P. larvae* counted on the culture plate was between 1 and 20.
- 2+ category means that there were 21-50 colonies of *P. larvae* counted on the plate.
- 3+ category means that more than 50 colonies were isolated.

Research for this program has also provided a guide as to the likelihood of not finding clinical signs of AFB in hives for a given category.

1 + category honey will have a 44% chance of no clinical symptoms of AFB being found in the hives represented by that particular honey sample. This is the same as saying that hives with honey with up to 400,000,000 SpL (800 times the IHS required 500,000 SpL level) will have a 44% chance of clinical symptoms of AFB not being found.

2+ category honey will have a 21 % chance of no clinical symptoms of AFB being found in the hives represented by that particular honey sample. This is the same as saying that hives with honey between 400,000,000 SpL and 1,000,000,000 SpL (between 800 times and 2,000 times the IHS required 500,000 SpL level) will have a 21% chance of clinical symptoms of AFB not being found.

It can be seen that, by itself, an inspection of all hives at the time of honey harvest for clinical symptoms of AFB, with or without OTC feeding, will do little to prevent honey with >500,000 SpL arriving in New Zealand.

But it gets worse, the relevant clause in the IHS is:

1.2.1 originate from Australian hives that have been inspected within the previous 12 months by an Apiary Inspector approved by the state Department of Agriculture and found not to be clinically infected or suspected to be clinically infected with *P. I. larvae*;

One scale produces enough spores to contaminate honey from 159 hives 20 days after infection		
One AFB scale has	2,500,000,000	spores
At 500,000 spores per litre this is	5,000	litres
This represents	7,085	Kilos
Australia has	673,000	Hives
Average Australian Crop	30,000,000	Kilos
Average crop per hive	44.58	
Number of hives' crop potentially contaminated	159	

From the IRA:

Infected individuals usually die nine days or more after hatching in either the larval or pupal stage, but recent in vitro studies have shown that larvae can die at a younger stage before the capping of the cell (Brodsgaard et al., 2000). Most spores are formed 11 days after hatching in propupae and each infected larva produces about 2500 million spores (Sturtevant, 1932).

I.e. in less than 15 days from clinical symptoms of one diseased larvae, there are enough spores to contaminate the entire crop from around 159 hives assuming a 44.6 kilo crop. An inspection for clinical symptoms within 12 months will offer negligible (using the definition as defined by MAF in the IRA) assurances that the level of spores found in imported honey will be below 500,000 SpL.

TO SUMMARISE.

Relying solely on an annual inspection of hives for clinical symptoms of AFB will have an inadequate impact on incidence of *P. I. larvae* at a level greater than 500,000 SpL arriving on New Zealand shores.

EQUIVALENCY

It is clear that clause 1.2.1 will be inadequate to provide negligible risk of honey arriving in New Zealand with infectious levels of *P. I. larvae* in the honey. However the IRA mentions equivalence in two places that need to be commented on, if clause 1.2.1 is claimed to allow equivalence.

The Import Risk Analysis indicates:

An equivalent level of protection to that achieved under the New Zealand National Pest Management Strategy (PMS) for American foulbrood could be achieved by requiring official veterinary certification from the country of origin that the bee products were not derived from hives that were known or suspected to be clinically affected by American foulbrood. For equivalence to the PMS, such certification would have to be backed by an annual inspection of hives by a person certified as competent to make the diagnosis of American foulbrood, following the guidelines set out in Appendix 3.4.2 of the OIE Code.

This assumes that the AFB PMS's sole mode of operation is an annual inspection of hives for clinical symptoms of AFB. This is wrong. The PMS relies on numerous interrelating mechanisms against a context and history of AFB control dating back to 1906 to achieve control of AFB. To repeat, New Zealand has the lowest reported levels of *P. I. larvae* in honey in the World. This outcome is the important part. In 2005 New Zealand had a falling level of 2.1 % *P. I. larvae* detected in honey (597 samples). Australia had 12.5% and rising in 1991. There is a 6 times lesser chance that *P. I. larvae* would be found in New Zealand honey today than in Australian honey in 1991. Sourcing honey from "hives that have been inspected within the previous 12 months" will never make this an equivalent outcome.

Although risk management measures against American foulbrood are warranted as a result of there being an official control program in place in New Zealand, under the principle of nondiscrimination covered in article 2.3 of the WTO Sanitary and Phytosanitary agreement, the measures imposed must not be greater than those achieved under the rules of the official control program. In other words, the acceptable level of risk is signalled by the rules of the control program. **The relevant rules under the National Pest Management Strategy are rules 29 (1) and 31(1) which prohibit the sale or use of bee products from hives known or suspected to be clinically affected by American foulbrood**

It is not possible to pluck one measure out of the AFB PMS and then use compliance with this measure to claim equivalence.

Therefore, it is appropriate to impose measures on imported bee products to provide the same level of protection that would be achieved by the application of that rule on New Zealand hives.

As mentioned the AFB PMS controls AFB in New Zealand with a range of interrelated measures contained in a complex piece of legislation that has been built on over 100 years and has the benefit of operating in a drug free environment unencumbered by the problems associated with the presence of EFB and OTC usage. Again, there is no single measure in the AFB PMS that can be picked on in isolation that will give equivalence of outcome.

AFB control in Australia is a mixed bag. In the introduction to the Australian DRAFT "AFB Business Plan 2003/2004" the following paragraphs are noteworthy:

State and Territory jurisdictions have legislative responsibility for the management of AFB. However each jurisdiction has a differing approach for the management of AFB with varying results. These State-based programs are mainly funded through the collection of apiarist registration fees. **Unfortunately, the numbers of apiarists registering their hives is presently low (<10%),** suggesting that the State-based programs do not have the major support of industry

How can honey enter New Zealand under clause 1.2.1 of the IHS if less than 10% of apiarists have registered their hives?

Recent Australian experience of **considerable and widespread economic loss caused by AFB and the limited success of State-based management programs in controlling the disease,** has re-emphasised the need for improved management and control systems applied in a nationally coordinated program.

Additional Paragraphs throughout the document indicate there are serious problems with AFB control in Australia compared to New Zealand.

The Prevalence of AFB in Australia is hard to determine due to the highly mobile nature of apiarists and inability to measure its incidence in feral bee populations.

It is common for apiarists to move hives and operate across State and Territory boundaries. **There are no restrictions in place or means to monitor the movement of infected or uninfected hives** across these jurisdictional boundaries, which facilitates the spread of disease.

Honey culture tests (HCT) - does not have either a high sensitivity of specificity and is best used as a screening test in honey.

Note: The problem with specificity referred to here is due to the presence of *Paenibacillus alvei* in honey in Australia. It is a spore forming bacteria normally associated with EFB but has been recorded being associated with other honeybee larval diseases. In Australia it often causes significant contamination of the culture plates for AFB. This is of significant concern to New Zealand should it arrive in New Zealand in Australian honey and become a problem with the monitoring function in the AFB PMS's annual surveys. It will also cause problems for anyone attempting to meet the <500,000 SpL level required in clause 1.2.2 by "testing".

The following table compares the situation between Australia and New Zealand for the control of AFB.

	New Zealand	Australia
National AFB control in place	Yes	Run state by state, no uniformity.
National Database of hives	Yes	No
Registration of apiaries	Mandatory including hive numbers and 1 :50,000 Map Grid reference	Less then 10% of beekeepers registering their hives.
GIS Mapping of apiaries and AFB disease	Yes	No
Requirement to destroy diseased hives and equipment	Yes	No
Legislative controls in place for infective Honey	Yes	No
Compulsory Annual reporting by beekeepers for AFB	Yes	No
Annual auditing of system via samples of bees, honey and larvae	Yes	No
Targeted inspections and "diseasathons" resulting from tracing audit results	Yes	No
Annual inspection of all hives for AFB	Yes	No
Beekeeper training	Disease Elimination Conformity Agreement(DECA) conditional on training and examination	Ad Hoc - not linked to control program - no examination requirement to ensure training effective
Drug feeding and associated problems with masking clinical symptoms AFB	Not permitted. OTC not found in Residue Testing programme.	Routine Prophylactic use with AFB spreading due to masking
Paenibacillus larvae larvae spores in Honey	2.1 % for 2005, level has been decreasing for last 4 years lowest recorded in World.	12.5% for 1991 showing 280% increase over previous 7 years. No subsequent published nationwide data. Probably increasing.
Presence of Paenabacillus alvei obscuring results from Honey Culture Test (HCT) for AFB	No	Yes

It is clear from this table that equivalence of AFB control must comprise significantly more than just an inspection of a beehive for AFB symptoms within the last 12 months.

Clause 1.2.1 is totally unacceptable as the only method of control of AFB entering New Zealand in honey coming from Australia.

CONTROL MEASURES FOR EUROPEAN FOULBROOD

There is industry opposition to the IRA's conclusion for EFB control particularly in two areas. While this opposition should be dealt with at the IRA level, the point needs to be made again at the IHS level.

1. There is only one limited study on the number of *M. pluton* bacteria normally found in honey. There are numerous references to difficulty getting accurate counts which further complicate any assessment of likely numbers of *M. pluton*.
2. There is no study of infectivity and therefore no minimum infective dose.

If there is no knowledge of the starting point before heat treatment, then there is no known final number and no knowledge of an infective dose. A guess times a guess does not equal a known r It represents an unknown risk.

EFB & WESTERN AUSTRALIA

Western Australia has been importing honey from Eastern Australia for some time without getting (that is known of). However W A requires double the amount of heating that is required by the IH: I.e. 65°C for 8 hours (480 minutes) compared with the time required in the IHS of 65°C for 4 hour 7 minutes (247 minutes).

If MAF are intent of running on gut feeling by bringing a disease to New Zealand while being unable to assess the risk, then why are they prepared to do so with a heat treatment that is half that the Australians themselves require?

Submission on the

DRAFT IMPORT HEALTH STANDARD FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS FROM ALL COUNTRIES

Peter Bray - Airborne Honey Ltd. 22 February 2006

5.1 The following products do not require a permit to import but they must meet requirements detailed in section 6:

5.1.2 composite products containing less than 2% honey, pollen or royal jelly;

Composite products that are attractive to bees e.g. some form of sugar syrup (perhaps a sports nutrition type product) should not be allowed with the blanket "less than 2%" rule. In the case of composite products that are attractive to bees, the honey part of the content should be subject to the same controls as honey products.



SUBMISSION TO

BIOSECURITY NEW ZEALAND

on the

DRAFT IMPORT HEALTH STANDARDS

FOR THE IMPORTATION INTO NEW ZEALAND OF SPECIFIED BEE PRODUCTS

By

FEDERATED FARMERS OF NEW ZEALAND (INC)

FEBRUARY 2006

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Draft Import Health Standards for the Importation into New Zealand of Specified Bee Products.

1 INTRODUCTION

Federated Farmers of New Zealand (FFNZ) and the New Zealand Bee Industry Group (NZBIG) thank the Ministry of Agriculture and Forestry (MAF) for the opportunity to submit on the *Draft Import Health Standards for the Importation into New Zealand of Specified Bee Products (Dec 2005)*.

Federated Farmers (the Federation) is a primary sector organisation that represents approximately 18,000 farmers and various other rural businesses including approximately 200 commercial and semi commercial beekeeping enterprises that manage approximately 75,000 beehives. Federated Farmers has a long and proud history of representing the needs and interests of New Zealand's farming communities, primary producers and agricultural exporters.

The agricultural sector is a significant player in New Zealand's economy and accounts for over 17% of GDP once downstream processing is taken into account. Agriculture sector productivity growth and economic growth have both outpaced that in the New Zealand economy as a whole. Agricultural products account for well over half of New Zealand merchandise exports.

2 RECOMMENDATIONS

NZBIG strongly recommends that the current draft import health standards be put on hold while more research is conducted into areas where there is currently a lack of information.

Federated Farmers recommends that an independent review of the submissions given in relation to the Import Risk Analysis: Honey Bee Products, December 2004 be undertaken, to ensure all concerns are given their due in a transparent and non- biased manner

Federated Farmers recommends that the assessing of P. Alvei as a saprophyte of honey bees (and not a hazard) be reassessed in light of experimental evidence (not opinion) that was not included in the Risk Analysis.

Federated Farmers recommends that MAF reassess its stance on P Alvei having the capability to infect honey bee larvae without the presence of European Foul brood.

Federated Farmers is concerned beekeepers would not be able to visually differentiate the symptoms of P. Alvei and American Foulbrood (AFB) out in the field and that this would lead to a detrimental effect on the AFB Pest Management Strategy (PMS) which would violate the Biosecurity Act 1993.

Federated Farmers strongly recommends that MAF gives greater consideration to the risk imported pest and disease incursion poses to New Zealand's economy.

Federated Farmers strongly recommends that MAF does not rely on heat treatment as a reliable risk management measure in relation to European Foulbrood (EFB). As the Federation is concerned with the reliability of the scientific evidence in the Risk Analysis.

Federated Farmers recommends that the biosecurity measures that Australia and the Pacific islands use be assessed. In particular the border controls in Western Australia, the disease surveillance in all parts of Australia with particular regard to Western Australia as well as the Pacific Islands. Also the Import Health Standards that are in place in Australia and the Pacific Islands need to be assessed

Federated Farmers also recommends that New Zealand be undertaking checks and regular surveillance for disease and pests on the products we are importing from these countries.

3 GENERAL COMMENTS

The New Zealand Bee Industry Group (NZBIG) considers biosecurity to be a very high priority. At this time it is our belief that certain bee products should not be permitted to be imported into New Zealand as the risk of exotic incursion is too great. NZBIG strongly recommends that the current draft import health standards be put on hold while more research is conducted into areas where there is currently a lack of information. NZBIG and Federated Farmers strongly consider that it is better to address these uncertainties now, rather than having to respond to a future biosecurity incursion, which would cost the bee industry, MAF and the wider agricultural industry a lot of money and time.

NZBIG has had an ongoing interest in these import health standards and submitted on the *Import Risk Analysis: Honey Bee Products (December 2004)* that forms the basis of the current *Draft Import Health Standards for Specified Honey Bee Products*. NZBIG was disappointed with the response in regard to industry submissions on the Import Risk Analysis. We are concerned that MAF did not

consider all of the relevant scientific evidence or acknowledge information gaps when writing the *Risk Analysis*, thus jeopardising the accuracy of its scientific evidence. To ensure that all concerns are given their due in a transparent and non-biased manner, NZBIG recommends an independent review of the submissions in relation to the *Import Risk Analysis: Honey Bee Products, December 2004*. An example of an appropriate individual to undertake this task would be Roger Morris, from EpiCentre at Massey University. Alternatively the Public Health Unit of Otago University would be an option.

The ongoing viability of New Zealand's Bee Industry depends on biosecurity measures to keep exotic organisms out of New Zealand. A recent example where the value of biosecurity was highlighted was the arrival of varroa in the North Island. With the threat varroa posed, the value of the honey bee was recognised to the wider New Zealand economy, both in pollination for primary industry, amenity planting and for the home gardener. Federated Farmers strongly supports industry strategies such as the Varroa Pest Management Strategy and the American Foulbrood Pest Management Strategy. We believe the highest priority needs to be placed on retaining the healthy and relatively disease-free status of New Zealand's honey bees.

MAF does not have significant expertise in regard to bees and there is very little research, which applies to the New Zealand situation. The industry is nervous about assumptions in the risk analysis, which are based on limited and, in some cases, dated research. This situation is considered unacceptable by NZBIG's membership, who cannot afford for faulty decisions to be made.

NZBIG is also concerned that Biosecurity New Zealand has a conflict of interest. Biosecurity New Zealand is charged with protecting New Zealand's borders from exotic pests and diseases and it is also required to consider and facilitate import protocols when requested as well as needing to operate under the current government policy. These obligations potentially create bias on Biosecurity New Zealand's behalf. NZBIG considers this to be another good reason for an appropriate independent body to review the submissions.

Classification of *P Alvei*

NZBIG is concerned with the analysis of *P Alvei* in the *Risk Analysis*. There is only one experiment carried out by *Bailey et al* in 1973 that supports the theory that *P Alvei* is a secondary invader (saprophyte) of honey bees. There have been very few scientific experiments undertaken in relation to honey bees and *P Alvei*. To reinforce its position of *P Alvei* as a saprophyte, MAF relies upon popular opinion and hypotheses. NZBIG is concerned at this approach. Popular opinion and hypotheses that are not proven should not be relied on as a reliable source in a document such as the *Risk Analysis*. Experimental evidence is the standard that should be relied upon particularly in a Risk Analysis such as this, which could have a significant impact on an industry.

NZBIG is also concerned at the treatment of evidence that supports *P Alvei* being a primary pathogen. We recommend that Dr R.M. Goodwin's evidence in his submission on *P Alvei* being a primary pathogen be reassessed in light of the fact that experimental evidence is the standard and not opinion or hypotheses. NZBIG would like to see valid scientific reasons if experimental evidence is being disregarded.

Because of NZBIG's recommends a reassessment of evidence on *P Alvei* being a primary pathogen based on experimental evidence, *P Alvei*'s status in regard to the initial hazard list, is as yet undefined.

Impact on Risk Management Strategy

NZBIG does not believe that MAF has adequately backed up its position that *P Alvei* only infects honey bee larvae that have been infected by *M Pluton*. NZBIG would like to know MAF's position in response to *Bailey et al (1972)* reporting that *P Alvei* were found from larvae that had died of sacbrood and also *Alippi (1997)* finding it in larvae killed by *P larvae larvae*. Confusingly MAF's own *Risk Analysis 22.1.4* does not assert that *P Alvei* only infects larvae infected with *M Pluton*, it states that it is found in **particular** with *M Pluton*, not exclusively. NZBIG would like this matter reassessed using scientific evidence to back up conclusions.

NZBIG notes that under the Biosecurity Act (1993) *P Alvei* has the potential to be classed as a hazard that would affect the Pest Management Strategy for American Foulbrood (AFB PMS). This is because beekeepers would not be able to visually differentiate the symptoms of *P. Alvei* and AFB out in the field and that this would lead to a detrimental effect on the AFB PMS. NZBIG recommends this needs to be addressed before the import health standards are put in place.

Small Hive Beetle / Bee Louse

NZBIG is also concerned that inadequate precautions are being proposed to keep Small Hive Beetle (*Atheina Tumida*) and Bee Louse (*Braula coeca*) out of New Zealand. Findings in the *Risk Analysis* were based upon research done on related species and not the actual honey bee. This cannot be considered to be ensuring adequately against risk. Even very closely related species can behave differently under the same circumstances, as has been found in the past and was stated in the industry's submissions to MAF. New Zealand needs to base biosecurity precautions on adequate and reliable scientific evidence.

Impact on New Zealand's Economy

NZBIG has concerns that the risks to New Zealand's economy as a whole were not taken into account in the *Risk Analysis*. In an article on Risk Analysis on page 24 of the December issue of Biosecurity New Zealand (Issue 64), it is clearly stated that Risk Analysis undertaken for biosecurity is concerned with "supporting the risk management decision making process to effectively manage "the pest and disease risk to New Zealand's economy".

Since the advent of varroa, the Bee Industry has been in a precarious financial state. There has been a dramatic decline in beehive numbers in the North Island and with this is the consequent risk of insufficient pollinators. The financial analysis developed at the time of the Varroa incursion identified potential costs measured in hundreds of millions of dollars to the New Zealand economy. This economic impact assessment suggests that, under beekeeper management only, varroa is likely to cost New Zealand agriculture at best around \$400 million and at worst around \$900 million, in present value terms, over the next 35 years⁸⁸.

New imported diseases could have a similarly devastating effect on the bee industry and the wider agricultural industry. The economic impact caused by imported pests and diseases is clearly in the scope of the *Risk Analysis* and NZBIG recommends MAF look into this and take this further into account when deciding the acceptable level of risk.

Biosecurity measures imposed by the Pacific Islands

⁸⁸ : *Varroa in New Zealand: Economic impact assessment. MAF Policy. November 2000*

NZBIG is very concerned with importation of products from the Pacific Islands. NZBIG is concerned that the Pacific Islands may not have biosecurity measures of a high enough standard to appropriately manage the risk of new pests/diseases being introduced there. We recommend that to safeguard New Zealand's biosecurity concerns the Pacific Islands need to be treated with caution. As their disease surveillance and own biosecurity measures are questionable, New Zealand should not rely on their assurances alone.

American Foulbrood

Finally a concern that was not dealt with at all in the *Risk Analysis* is that of American Foulbrood existing in several different strains with considerable differences in virulence. We do not know what strains we have in New Zealand and what strains are present in Australia or the Pacific Islands. This is information that needs to be established, if the strains are found to differ this could have a detrimental effect on our AFB PMS. This is a very important issue that has not been dealt with in the risk assessment. NZ BIG strongly recommends that more research be done on this issue.

4 SPECIFIC COMMENTS

4.1 Draft Import Health Standards for All Countries

Part B section 7.1.7 referring to returned New Zealand honey appears to contain a drafting mistake. It states that returned New Zealand honey is eligible for biosecurity clearance provided an inspector has no reason to believe that the honey is of NZ origin. NZBIG considers this should be amended to read "...is *not* of New Zealand origin".

Part B section 7.1.2 refers to composite products that contain less than 2% of honey, pollen or royal jelly and are eligible for biosecurity clearance provided they have a manufacturer's declaration stating this. Federated Farmers is concerned with this clause as it does not address the issue of how much sugar is in the rest of the product. Whilst there may be a very small amount of honey in the product, if there is sugar contained in the product as well, this will make the product attractive to bees and cause the same risks as if it were honey. Federated Farmers asks MAF to review this clause in light of this fact.

Part B section 5.2 refers to composite products that contain at least 2% honey, pollen or royal jelly. This section states they need to be assessed by MAF before they are issued a permit. NZBIG requests that the criteria that MAF would use to assess whether a product is eligible for a permit be made part of the import health standard. NZ BIG would like to know exactly what this assessment involves and what methods are used. For instance, is a visual inspection or a scientific test proposed to be used and in what circumstances? This method needs to be clear and foolproof so our members know that they can rely on MAF to be acting in their best interests.

4.2 Draft Import Health Standards for Australia

European Foulbrood and heat treatment.

Part D section 10 (iv) (1.1.2) shows the temperatures that bee products need to be heated to, and for how long, to meet the import health standard. However, the scientific evidence is not conclusive on heat treatment being effective in eradicating European Foulbrood (EFB).

The *Risk Analysis* states that the “normal” concentration of organisms in honey is about 3.5 log 10 CFU/ml. This is a flawed assumption that MAF failed to address in the review of submissions (a primary reason for why Federated Farmers contends that the *Risk Analysis* needs to be independently assessed). This figure is taken from *Wooten et al (1987)* who carried out the study at *one* time of year in *one* country (Australia). There are many other factors that potentially could influence the distribution of *M. Pluton* in honey, including hive management, season, percent of hives infected as well as the risk of antibiotics etc. Also we do not know how *M Pluton* distributes itself in honey. These conclusions assume that *M Pluton* is equally distributed in honey as opposed to floating sinking or clumping. This *one* test found 3.5 log 10CFU/ml as the average. For this to be conclusive many other tests would need to be done to be able to accurately conclude that this is the case.

NZ BIG recognises that the *Risk Analysis* does include some other tests to support its assumptions. These were carried out by *Ball et all* and erring on the side of caution contained a higher amount of *M Pluton* than what *Wooton* had found as his average. Whilst these tests were successful in eradicating *M Pluton*; NZBIG considers it not advisable to jump to assumptions regarding these tests credibility in regard to honey from hives sourced in differing conditions. NZBIG considers Biosecurity NZ would be negligent, if it exposed New Zealand to the risk of importing EFB into the country by not assessing this issue further. NZBIG strongly urges MAF to not rely on heat treatment as a risk management measure.

American Foulbrood and Inspections.

NZBIG is concerned about the level of qualification of the inspectors in markets exporting to New Zealand. NZBIG recommends that for eligibility for export, inspectors should be trained to the same standards as New Zealand’s ‘Authorised Person’ who undertake inspections. If they are not to same standard as New Zealand’s inspectors we are creating a further risk of letting AFB into the country.

Part D section 10 (iv) (1.2.2) refers to using a spore count test as a measure against AFB. NZBIG is concerned over the methods that are to be used in relation to this. NZBIG contends that for spore testing to be effective we need to know how AFB distributes itself in honey. We need to know whether it sinks, floats or clumps together and if it does these things we need to have tests that ensure against inaccurate (fluctuating) results on this basis. We also request that the sample rate be established and included in the import health standard.

Australia’s Biosecurity.

It is a primary concern of NZBIG’s members to know what Australia’s biosecurity is like in respect to border control between Western Australia (WA) and the other states. It needs to be established whether WA is effectively isolated from the other states. We also need to know what safeguards there are to ensure that the honey products being imported from Western Australia do actually originate there. We need to be certain that products cannot enter Western Australia from other states and then be passed off as Western Australian product.

NZBIG also has concerns over the surveillance programmes for diseases that are in effect in Western Australia. We are concerned that we are placing too much reliance on WA’s assurances that they are EFB free; we need to be confident in their methods of surveillance. Alarmingly New Zealand has very high levels of surveillance for pests and diseases, yet *Varroa* was thought to be in the country for an estimated two years before it was identified. NZBIG is therefore concerned that Australia’s surveillance would not be able to detect an incursion in time.

NZBIG asserts that New Zealand should be auditing Australia's biosecurity surveillance programmes and border control. It is essential we have our own checks and controls. It would then be advisable to establish from the amount of auditing and checking that was being done, what the probability of undetected non-compliance would be. From that point we could assess the amount of risk we are taking for contracting EFB.

NZBIG is also concerned as to whether New Zealand will be doing any checks and tests on the products imported from Australia. It is our concern that if New Zealand is not carrying out its own surveillance then we are placing ourselves at the mercy of Australia. Australia does not have the vested interest in keeping our industry pest free as we do. As this is a matter that has the potential to have a major effect on the bee industry and wider agricultural industry. It would be imprudent to leave surveillance of diseases to another country, especially when their primary interest is securing an exporting market as opposed to keeping New Zealand pest/disease free.

NZBIG also considers that New Zealand needs to be aware of the countries that Australia is importing from and what their import health standards in relation to these countries are. This is important as we need to know the potential range of pests and diseases that we are putting ourselves at risk to. We also need to establish that Australian import health standards are up to New Zealand's expectations.

Bee Louse and Small Hive Beetle.

Part D section 10 (iv) 2.1.2 refers to an import health standard in regard to bulk extracted honey. The honey in the drum is off a low risk however the drums could be a high risk to hitchhiker beetles. Any smell of honey or wax etc on the drums would be very attractive to small hive beetles. Part D 10 (iv) 2.3 refers to raw beeswax or propolis. The wax, whether it is processed or not, would also be very attractive to Small Hive Beetle and susceptible to becoming infected in transit. NZBIG contends that as product or packaging can easily become infected after packaging and treatments, controls on how the product is packaged, handled and transported are essential as part of an import health standard.

4.3 Draft Import Health Standards for the Pacific Islands

American Foulbrood Inspections.

NZBIG is concerned that the only method in the Draft Import Health Standards for the Pacific Islands in relation to treating AFB is inspection. Pacific Islands import health standards, unlike the Australian standard, does not include the spore count method. We recommend that this risk management measure also be an option for the Pacific Islands, unless there is a particular reason why this has not been included.

As discussed above in 4.2, NZBIG is again concerned as to the level of qualification of the inspectors.

Bee Louse and Small Hive Beetle

Part D section 10 (iv) 2.2 refers to import health standards in regard to raw beeswax and raw propolis. As stated above, wax whether processed or not, would be very attractive to Small Hive Beetle and susceptible to becoming infected in transit. We again recommend that as product or packaging can easily become infected after packaging and treatments. Controls on how the product is packaged, handled and transported is essential as part of an import health standard.

Pacific Island Biosecurity

NZBIG is concerned over disease surveillance programmes that are in effect in the Pacific Islands. We are concerned at the reliance New Zealand is placing on the Pacific Island's assurances that they are free of EFB, Bee Louse and Small Hive Beetle; we need to be thoroughly confident in their methods of surveillance. As has been stated above New Zealand has very high levels of surveillance for pests and diseases, yet varroa was thought to be in the country for an estimated two years before it was identified. NZBIG is very concerned that the Pacific Island's surveillance would not be able to detect an incursion in time. NZBIG asserts that New Zealand should be auditing the Pacific Island's biosecurity surveillance programmes. It would then be advisable to establish from the amount of auditing and checking that was being done, what the probability of undetected non-compliance would be. After this has been established, decisions on importing could be made.

NZBIG is also concerned as to whether New Zealand will be doing any checks and tests on the products imported from the Pacific Islands. It is our concern that if New Zealand is not carrying out its own surveillance then we are placing ourselves at the mercy of the Pacific Islands. The Pacific Islands do not have the vested interest in keeping our industry pest free as we do. This is a matter that has the potential to have a major effect on the bee industry and wider agricultural industry. Therefore it would be imprudent to leave surveillance of diseases to another country, especially when their primary interest is securing an exporting market as opposed to keeping New Zealand pest and disease free.

NZBIG also considers that New Zealand needs to be aware of the countries that the Pacific Islands are importing from and what their Import Health Standards in relation to these countries are. It needs to be assessed as to whether the standards used are consistent with New Zealand's expectations. This is important as we need know the potential range of pests and diseases we are potentially putting ourselves at further risk to.

5 APPENDIX ONE

Questions Federated Farmers is waiting for a Response on from MAF's Import Health Standards Team:

Permits

- In relation to composite products with over 2% honey/pollen or royal jelly. What exactly would this MAF assessment involve?
- Would the products be tested and if so using what methods or would they just be visually inspected?
- Is there a criteria that the products would be expected to meet?

Imported products from Western Australia

- What safeguards are being put in place to ensure the products actually originate in W.A.?
- What is Australian biosecurity like in respect to border control from state to state? Is W.A. effectively isolated?
- Do we know much about their IHS in relation to honey bee products they import from foreign companies?
- What is W.A. surveillance programme for diseases like? (does it come up to New Zealand's own standards) i.e. if an incursion occurred do they have methods in place to ensure early detection. In New Zealand varroa was thought to be here two years before detected.
- Will New Zealand be doing any checking of the product that is entering N.Z. or are we relying on Australia for this?

- Will NZ be doing audits of Australian Biosecurity in regard to its border control and disease surveillance?
- With the level of auditing/checking that will be taking place what is the probability of undetected non – compliance?

Inspections for AFB in Australia and Pacific Islands

- Who exactly will these “government appointed” inspectors be?
- What methods would they be using? Visual, scientific?
- Will we be auditing their methods? Do we know what the probability of undetected non-compliance is?
- Do we know what particular strains of AFB the countries that we are importing from have? Are they the same as New Zealand?

Spore testing for AFB

- How are samples planned to be taken.
- Do we know what happens to AFB in honey? Does it sink, float clump together? If so how are the tests taken to ensure against his/
- What is the sample rate likely to be – one sample per tonne, one sample per shipment??

Importation from the Pacific Islands

- What is the standard of bio-security like in the countries we are planning on importing from?
- Do we know much about their IHS in relation to honey be products they import from foreign companies?
- What is the disease surveillance like in these countries? I.e. if an incursion occurred do they have methods in place to ensure early detection?
- Will New Zealand be doing checking of the product that is entering New Zealand from these countries or are we solely relying on the Pacific Island nations’ integrity.
- Will New Zealand be doing any audits of the Pacific Islands biosecurity in regard to its border control and disease surveillance?
- With the level of auditing/checking that will be taking place what is the probability of undetected non – compliance?

Irradiation

- Are we in New Zealand actually allowed to subject our food products to irradiation?

Small Hive Beetle / Bee Louse

- Concern that the product (drums of honey, pollen not packaged for retail, raw beeswax or raw propolis) could become infected after packaging and treatment. What safeguards are there in relation to that?