Review of the biosecurity risks of prawns imported from all countries for human consumption

Submission from the Department of Agriculture and Fisheries, Queensland

Introduction

The Department of Agriculture and Fisheries (DAF) welcomes the opportunity to provide comments on the *Review of the biosecurity risks of prawns imported from all countries for human consumption*, September 2020 (the Review), by the Department of Agriculture, Water and Environment (DAWE) and recognises the significant depth and extent of work that is associated with the development of this report.

Executive Summary

The human mediated introduction of White Spot Syndrome Virus (WSSV) into south east Queensland and the subsequent ongoing detection of the disease agent within Moreton Bay, Queensland, has demonstrated the critical importance of effective border controls to ensure that similar events do not occur in the future.

DAF notes that the Review does not fully consider the potential scope for new and emerging disease in aquaculture. DAF advocates a proactive approach to emerging threats rather than a purely reactive approach. Queensland supports the testing for a broad range of known/suspected/emerging pathogens to prevent their introduction recognising that control and eradication is not always possible.

DAF recommends that the proposed national recreational fishing survey results should be used to inform the Review as Queensland surveys have shown that 23 per cent of respondents reported the use of supermarket prawns as bait. Queensland also recommends a cooperative and concerted national focus on this issue to further inform and educate jurisdictions and stakeholders about the issues surrounding the use of imported seafood as bait or berley.

Queensland recommends removal of the "*Use of Imported prawns as feed for crustacean broodstock*" as a major exposure pathway as the practice of feeding prawns to broodstock is no longer practiced in Australia.

Using a one-year period for entry and exposure likelihood estimations fails to acknowledge the significance of longer-term continuous entry and exposure to wild crustaceans, particularly where the annual likelihood of entry (LR) assessment is **High** and the confirmed exposure pathways are known to persist (e.g. introductions via bait and berley).

Queensland recommends that these hazards included in the Review, both the partial likelihood of exposure (PLE) and partial annual likelihood of entry and exposure (PALEE) be assessed as **High** where:

- LR is assessed as **High** for the exposure group "wild crustaceans";
- susceptible species are present in wild populations; and
- where known persistent major exposure pathways exist.

Although there are some factors that reduce exposure risk for "wild crustaceans" and subsequently influences the assessed partial likelihood of establishment and spread, there are numerous factors that should be considered in this context including lack of data to show that the density of wild crustaceans prevents exposure, the schooling behaviour of prawns and lack of knowledge about the critical density of susceptible hosts.

In the event of a pathogen/disease identified in prawn grow out facilities, then exposure to wild crustaceans should be considered certain where susceptible species are present.

Specific recommendations about covert mortality nodavirus (CMNV), decapod iridescent virus 1, infectious myonecrosis virus and the proposed biosecurity measures for imported prawns are made in Table 1.

Biosecurity Risks of Prawns

The human mediated introduction of White Spot Syndrome Virus (WSSV) into south east Queensland and the subsequent persistent infection of this disease agent within Moreton Bay, Queensland, has demonstrated the critical importance of effective border controls to ensure that similar events do not occur in the future.

The effects resulting from this incursion are widely reported, including those on the prawn farming and commercial fishing sectors and the prawn bait industry. These have been significant to Queensland and the state continues to deal with the continuing long-term economic, social and environmental burden.

In recent years, many new diseases have emerged in aquaculture[1] [2] due to virus factors, animal host factors, environmental factors, and/or anthropogenic factors. Increasing aquaculture expansion and factors such as climate change means that it is highly likely that this trend will continue[3]. However the Review does not consider the level of protection required for new and emerging diseases ie. it is reactive to known threats rather than proactive to emerging threats.

Recreational Fishing Surveys

The Review notes that there are no recent national survey results for the use of imported prawns intended for human consumption as bait or burley but that a survey is underway. The results of the Kantar surveys in 2017 and 2019 (page 64) undertaken by the Queensland Government showed 23 per cent of respondents reported the use of supermarket prawns as bait andit is recommended that the national survey results are used to further inform this draft risk review prior to its completion.

It is highly plausible that the incursion of WSSV in the 2016 event resulted from infected imported prawns being used as bait near the adjoining prawn farm(s) leading to significant infectivity of WSSV on-farm and subsequently into the surrounding environment. The subsequent infection of the farm(s) is considered as a significant risk pathway for populations of wild crustaceans.

Establishment of hazards in local wild populations should be considered the most significant risk as establishment means that impacts will flow to aquaculture (production losses; increased operating costs), wild harvest fisheries (impacts on wild stocks, trade/movement restrictions) and potential domestic and international trade.

Section 4.3.2 - Identification of exposure pathways

The inclusion of “Use of Imported prawns as feed for crustacean broodstock” (p68) as a major exposure pathway is not supported as there is no evidence provided to suggest this is practiced by industry. It appears this is a suggestion carried over from the Prawn IRA 2009. Additionally, this section is confusing with the same literature referenced to support contradictory statements.

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[1] Alexander G. Murray, Edmund J. Peeler, A framework for understanding the potential for emerging diseases in aquaculture, *Preventive Veterinary Medicine*, Volume 67, Issues 2–3, 2005, Pages 223-235, ISSN 0167-5877, https://doi.org/10.1016/j.prevetmed.2004.10.012.

[2] Kibenge FS. Emerging viruses in aquaculture. *Curr Opin Virol*. 2019 Feb;34:97-103. doi: 10.1016/j.coviro.2018.12.008. Epub 2019 Feb 1. PMID: 30711892

[3] Walker PJ, Winton JR. Emerging viral diseases of fish and shrimp. *Vet Res*. 2010;41(6):51. doi:10.1051/vetres/2010022

The statement "*Uncooked prawns are known to form a significant component of broodstock conditioning diets*" is outdated and unsubstantiated in current farming practices particularly in Australia.

Queensland considers that the inclusion in the risk assessment of "*Use of Imported prawns as feed for crustacean broodstock*" as a major exposure pathway is misleading, unsubstantiated and infers that this practice of feeding prawns to broodstock is still practised in Australia despite the volume of evidence suggesting otherwise.

Queensland recommends this be removed from the "major pathway for exposure" category in this Review.

Section 4.1 Entry and exposure likelihood estimations - likelihood of the event occurring over a one-year period

With reference to Page 52 "Entry and exposure likelihood estimations consider the likelihood of the event occurring over a one-year period", Queensland makes the following comments.

- Limiting the likelihood estimations to a one-year period for entry and exposure fails to acknowledge the significance of longer-term continuous entry and exposure to wild crustaceans, particularly where the annual likelihood of entry (LR) assessment is **High** and the confirmed exposure pathways are known to persist (e.g. introductions via bait and berley).
- In most of the risk assessments conducted in this Review, the partial likelihood of exposure (PLE) and partial annual likelihood of entry and exposure (PALEE) assessment for hazards to the exposure group "wild crustaceans" is rated **Moderate.** Queensland considers the probability of exposure would be "very likely to occur" particularly where susceptible species are present in the environment and the exposure pathway is known to persist over time. The WSSV outbreak in 2016 supports this consideration.

Queensland recommends that these hazards included in the Review, both PLE and PALEE be assessed as **High** where:

- LR is assessed as **High** for the exposure group "wild crustaceans"
- susceptible species are present in wild populations and,
- where known persistent major exposure pathways exist.

Section 4.3.3 Use of prawns intended for human consumption as bait or berley for recreational fishing

The Australian Government's Biosecurity import conditions (BICON) for the importation of seafood intended for human consumption is that the product must state on packaging that it is NOT to be used as bait. This is an Australian Government legislative import requirement.

The import requirements for prawns and squid products state the following

- Prawns: Each package is marked with the words "for human consumption only - not to be used as bait or feed for aquatic animals".
- Squid: Each individual package (i.e. the smallest packaged unit) of all consignments must be labelled: 'For human consumption only - not to be used as bait or feed for aquatic animals'.

While this is an important requirement from a national compliance point of view if this is not reinforced at the jurisdictional level then the compliance intent is ineffective to a large extent.

There is already a large body of evidence presented in the Review and other sources that imported prawns and possibly other seafood sources are used as bait or berley by fishers. This is despite the current product import requirements and labelling which prevents these products being used in these ways.

Queensland recommends a cooperative and concerted national focus on this issue to further inform and educate jurisdictions and stakeholders about the issues surrounding the use of imported seafood as bait or berley. To further reinforce this issue, a national discussion at the National Biosecurity Committee level or equivalent on jurisdictional commitment to compliance for this issue is recommended.

The above comments also apply to Section 5.1.9 of this Review.

Section 4.5.1

The second paragraph outlines the feasibility/inability to eradicate an aquatic animal disease in the aquatic environment. Queensland supports this and can attest to the difficulty of eradicating WSSV in the aquatic environment. Given this conclusion Queensland supports the testing for a broad range of known/suspected/emerging pathogens to prevent their introduction knowing that control and eradication is not possible.

This also gives further support to Queensland's recommendations to include specific disease agents included in future testing requirements. Refer to comments in Section 7 below.

Sections 6-15

The following statement is considered relevant for all hazards included in the document during assessment of exposure:

"*Wild crustaceans would be less abundant than crustaceans in aquaculture facilities and may encounter greater competition from other animals for any prawn material present in their environment. In the wild, crustaceans must compete with predatory finfish and other scavengers (including other invertebrates and birds) for bait scraps and berley."*

The statement is inferred as reducing relative exposure risk and influences the PLE assessment for the exposure group "wild crustaceans" and subsequently influences the assessed partial likelihood of establishment and spread. However, there are numerous factors that should be considered in this context including:

- while abundance of crustaceans in aquaculture facilities is higher than in naturally occurring wild populations, there is no evidence to show density of wild crustaceans prevents exposure
- many crustaceans, particularly prawns, aggregate and travel in schools, while zooplankton are known to "swarm" which significantly increases density of susceptible species for exposure to a hazard
- the establishment of pathogens in wild populations is well documented from surveillance for many of the listed hazards suggesting density of wild susceptible species is no barrier
- there is no evidence to demonstrate what the critical density of susceptible hosts must be to prevent exposure
- the recent WSSV outbreak in south east Queensland clearly demonstrates that the density of wild susceptible hosts for this disease are present in the environment.
- the environment has greater diversity of susceptible species (diversity of taxa and life -stages) when compared with aquaculture that typically culture single species adults and sub-adults.
- "*other invertebrates*" and even finfish have been identified as potential hosts/vectors for identified hazards and may sustain and transmit infection to wild crustaceans
- the range of susceptible species for many of the listed hazards has yet to be confidently identified

- exposure of wild populations to imported prawns via bait and berley has been proven as a real and present major exposure pathway
- long term continuous exposure to wild populations due to identified culture within recreational fishers is unlikely to change as evidenced on page 67 - during the Kantar Public survey:

> *If you're going to allow prawns into Australia and sold in the shop it is going to be used. It doesn't matter if you put signs up or whatever… So you don't let the product in Australia. You don't say 'we'll let it into Australia, but people won't use it for bait.' They will use it for bait. It is as simple as that*.

Based on the available information (including comments regarding Section 4.1 above) it is recommended that for hazards included in the Review, both PLE and PALEE be assessed as **High** where:

- LR is assessed as **High** for the exposure group "wild crustaceans"
- susceptible species are present in wild populations and,
- where known persistent major exposure pathways exist.

Section 4.5.2

Partial likelihood of establishment and spread associated with the outbreak scenario

The following statement is not supported for the reasons detailed below:
"For example, prawn farm effluent in Australia may be treated through settlement, dilution and screening before it is released into natural waters. This could reduce the amount of pathogenic agent (or dose) encountered by a susceptible animal, as well as reducing the likelihood of spread to wild crustaceans or other farms. This settlement process will also reduce the likelihood of escapees, which decreases the likelihood of spread to other exposure groups. It may be less likely that large numbers of dead or live prawns will escape prawn farms under the usual circumstances. However, if there was an accidental release of a large number of animals from a farm and they were infected with a hazard, the effect of dilution under this circumstance would be less, due to the ability of potentially susceptible animals (that is wild crustaceans) to detect and capture food material (or otherwise encounter an infected prawn), notwithstanding competition from non-susceptible species.

Reasons why the statement is not supported:

- Given the presence of a pathogen and corresponding disease on farms, settlement, dilution and screening would be insignificant when considering the risk of exposure to wild crustaceans to an infective dose, given the amount of pathogenic agent generated during a disease outbreak.
- Settlement systems are designed to hold water to reduce turbidity and nutrient load prior to discharge and could be argued as having minimal effect on pathogen load where pathogens are attached to living organisms or are taken up by biological vectors.
- Screening of effluent water is "at best" coarse level and only designed to prevent sub adult/adult prawns from leaving the property. It would have no effect on smaller individuals or cohabitating species found in association with prawn farms (e.g. small/larval crustacean species or zooplankton)
- It is a known fact that prawns escape from farms as evidenced during surveillance in southeast Queensland and catch information reported by local commercial fisheries does occur.

- Farms are unable to prevent all water leaving the farm during normal production operations.
- Water effluent treatment in prawn grow out systems for pathogens is not practiced in Australia unless there is a known disease outbreak
- In the event of a disease outbreak on farm, by the time the disease issue is identified and a biosecurity response enacted, significant quantities of effluent water and potentially infected animals may have already been released to the environment. This was evident and easily observed during the WSSV outbreak in 2016/2017.

Additionally, the Review also recognises successful transmission to wild populations including from an infected farm:

Page 80 - *"Based on current scientific information, water transmission for the hazards is considered very effective. If a hazard were to establish in a farm, doses of the hazard sufficient to cause disease would be present in the water column and could spread to other farms and wild crustacean populations through release of untreated effluent water into shared waterways."*

In the event of a pathogen/disease identified in prawn grow out facilities, then exposure to wild crustaceans should be considered certain where susceptible species are present in wild populations.

Comments specific to assessed hazards

Table 1: Specific recommendations

Hazard	Issue	Recommendation
Covert mortality nodavirus (CMNV) risk review On Page 124 PLE assessed as **Moderate** and PALEE assessed as **Moderate** for the exposure group - wild crustaceans	Please refer to previous comment.	Queensland recommends that for hazards included in the IRA, both PLE and PALEE be assessed as **High** where: • LR is assessed as **High** for the exposure group "wild crustaceans" • susceptible species are present in wild populations and, • where known persistent major exposure pathways exist.
CMNV risk review On Page 126 PLES assessed as **Very Low** *"If establishment of CMNV were to occur in the wild, spread to other populations would be* *less likely than for farmed or hatchery crustaceans because infected wild animals* *(particularly those clinically affected) are likely to be prey for non-susceptible animals. The* *densities of susceptible animals are also much less*	This statement infers that spread of disease from infected farms is direct to other farms rather than via environment and then to other farms. However the introduction of disease onto farm is mostly probable after establishment in the environment as suggested for WSSV in south east Queensland. The suggestion of disease starting on farm due to the direct introduction of infected imported prawns has already been described as unlikely at best through-out the Review. As observed during WSSV surveillance in wild populations, almost all animals testing positive for WSSV have been subclinical, while remaining potentially infective to other animals and arguably subject to natural predation rates There is no evidence to suggest densities of wild crustaceans is a restrictive barrier to transmission CMNV has a broad host range across diverse taxa with many species or related species present in Australia (as referenced in this Review) while comparing host range of CMNV to WSSV to	Given the available information and criteria used in the risk assessment Queensland recommends that for CMNV both PLE and PALEE be assessed as **High,** and that **PLES** be assessed at minimum **moderate** for the exposure group **"**wild crustaceans" both for unrestricted and restricted (H&S removal) categories. H&S removal and deveining is not considered to significantly reduce the risk of exposure to an infective dose of CMNV. Following assessment process for exposure group wild crustaceans: • consequence of the outbreak scenario assessment recommended- **Moderate** • partial annual risk assessment recommended - **Moderate**

Hazard	Issue	Recommendation
which reduces the opportunities for *transmission. The host range of CMNV present in Australia is smaller than for other hazards* *such as WSSV which also reduces the opportunities for transmission and spread to its* *natural geographic limits."* -	infer unlikely establishment is biased considering WSSV is considered a pathogen with an "extreme" host range. As more scientific evidence becomes available, given the already broad host range described it could be reasonably assumed that the susceptible species list will increase with time. Statements provided to infer reduced likelihood of establishment and spread in wild crustaceans are not supported as written ie: *If CMNV were to establish on a farm it could spread to neighbouring farms or wild populations through effluent water. This spread may be moderated by dilution effects and implementation of biosecurity measures should an incursion of CMNV be suspected and response measures initiated.* Suggested dilution effects would be insignificant as previously stated in this Review. The response and the implementation of biosecurity measures are unlikely to be enacted in a timely manner primarily based on the disease being difficult to detect in the early stages – hence the name "covert mortality nodavirus".	Estimation of overall annual risk assessment recommended **- Moderate** As a result, Queensland recommends that CMNV be included for 2x batch testing along with WSSV and YHV1.
Decapod iridescent virus 1 risk review	On Pages 138 & 139 PLE assessed as **Moderate** and PALEE assessed as **Moderate** for the exposure group – wild crustaceans**.** For reasons previously stated these assessments are questioned. Queensland recommends that for hazards included in the IRA, both PLE and PALEE be assessed as **High** where:	Given the available information and criteria used in the risk assessment Queensland recommends that for DIV1 both PLE and PALEE be assessed as **High,** and that **PLES** be assessed at minimum **moderate** for the exposure group **"**wild crustaceans" both for unrestricted and restricted (H&S removal) categories. H&S removal and

Hazard	Issue	Recommendation
	• LR is assessed as **High** for the exposure group "wild crustaceans" • susceptible species are present in wild populations and • where known persistent major exposure pathways exist. On Page 140 PLES assessed as **Very Low** Statements provided to infer reduced likelihood of establishment and spread in wild crustaceans are not supported based on reasoning as described above for CMNV. Considering the statement: *Infection with DIV1 is an emerging disease and as such, it is noted that the availability of* *evidence about the susceptibility of many native Australian crustacean species to infection with* *DIV1 is limited.* As reported in the Review, information is already published indicating that DIV1 may be infective to a broad range of taxa either naturally or experimentally including species found in Australia. Of particular note is the mention of both *Penaeus monodon* and *P. merguiensis*, two species which are predominant in aquaculture and also harvested by commercial trawl operations. As more scientific evidence becomes available it could be reasonably assumed that the susceptible species list will increase with time.	deveining are not considered to significantly reduce the risk of exposure to infective dose of DIV1. Following assessment process for exposure group wild crustaceans: • consequence of the outbreak scenario assessment recommended- **Moderate** • partial annual risk assessment recommended - **Moderate** Estimation of overall annual risk assessment recommended **- Moderate** As a result, Queensland further recommends that DIV1 be included for 2x batch testing along with CMNV, WSSV and YHV1.

Hazard	Issue	Recommendation
Infectious myonecrosis virus risk review	As discussed previously, given the likelihood of exposure, establishment and spread of IMNV and susceptibility of the known Australian species which are of significant commercial importance for both aquaculture and wild fisheries. These same issues arise as above where there is influence on the annual risk assessment	
Proposed biosecurity measures for imported prawns	DIV has been omitted from the list of pathogenic agents under 16.2.1 (a) Based on available information the proposed recommendations for CMNV and DIV1 are not supported and Queensland would suggest these -do not meet Australia's ALOP for these hazards	DIV1 to be added to the list at 16.2.1 (a) 16.2.2 Recommended: • that all imported prawns be free from both CMNV and DIV1 • product from each batch (see Appendix 4 for batch definition) has been found post-processing to be free of CMNV and DIV1 based on a sampling and testing method recognised by the World Organisation for Animal Health (OIE) for demonstrating absence of disease • On-arrival in Australia each batch of uncooked prawns will be subject to seals intact inspection and testing for WSSV and YHV1 at a screening laboratory approved by the department.