Supplementary Import risk analysis:
Head-on, gill-in Australian salmonids for human consumption.

REVIEW OF SUBMISSIONS

23 March 2000

MAF Biosecurity Authority

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Animal Biosecurity
Biosecurity Authority

Supplementary import risk analysis: head-on, gill-in Australian salmonids for human consumption.

REVIEW OF SUBMISSIONS

8 March 2000

Approved for general release

Dr B D O'Neil
Group Director
Biosecurity Authority

1. EXECUTIVE SUMMARY

On 27 September 1999 MAF Biosecurity Authority published the *Supplementary import risk analysis: Head-on, gill-in Australian salmonids for human consumption.* The risk analysis was supplementary to previous analyses completed in 1994 and 1997 respectively.

The diseases identified as being of potential concern were atypical strains of *Aeromonas salmonicida*, lymphosarcomas in Tasmanian Atlantic salmon, streptococcosis, and epizootic haematopoetic necrosis virus (EHNV). The risk analysis assessed each of these diseases, and concluded for the first three that the risk of introduction posed by head-on, gill-in salmonids for human consumption was low or negligible. Specific measures were recommended for EHNV.

MAF received 12 submissions on the supplementary risk analysis, the content of which is summarised in this document. As a result of questions raised in submissions regarding one disease, MAF sought further expert opinion and received three further submissions, which are also summarised in this document.

MAF concludes that none of the points raised in submissions affect the validity of the conclusions in the supplementary analysis, or the risk analyses that have preceded it.

2. INTRODUCTION

On 27 September 1999 MAF Biosecurity Authority published the *Supplementary import risk analysis: Head-on, gill-in Australian salmonids for human consumption.* The risk analysis was supplementary to a previous analysis completed in 1997 [1], which itself had a precursor in 1994.[2] All three analyses contain information relevant to the issue under examination.

The supplementary analysis was notified as available for a period of public consultation in the MAF publication *Biosecurity,* issues 14 and 15, 15 September and 1 November 1999. The deadline for submissions was 15 November 1999.

MAF received submissions from the following:

1 Department of Conservation. 12 November 1999. Letter from Clare Miller, for the Director General. 5 pages.

2 National Institute of Water and Atmospheric Research Ltd (NIWA). 22 October 1999. 1 page letter from Nelson Boustead.

3 New Zealand Federation of Freshwater Anglers (Inc.). 6 November 1999. Letter from Ken Sims, Secretary. 4 pages.

4 Fish and Game New Zealand, New Zealand Council. 12 November 1999. Letter from Mike Britton, Assistant Director. 4 pages.

5 Fish and Game New Zealand, North Canterbury Region. 21 October 1999. Letter from B.F.Webb, Manager. 3 pages.

6 Taupo Fishery Advisory Committee. 14 November 1999. Fax from John Davies, Chairman. 2 pages.

7 New Zealand Salmon Anglers Association Incorporated. 11 November 1999. Letter from Ron Dougherty, President. 2 pages.

8 Southfresh Limited. 6 October 1999. 1 page letter from Toby Warren.

9 Australian Quarantine and Inspection Service, Food Policy Branch. 19 October 1999. E-mail from Mark Kelly, Processed Food Policy Section. 1 page.

10 Dr Brian Jones, Senior Fish Pathologist, Fisheries Western Australia. 10 November 1999. 1 page e-mail.

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1 Stone MAB, MacDiarmid SC, Pharo HJ. (1997). Import health risk analysis: salmonids for human consumption. Ministry of Agriculture Regulatory Authority, New Zealand. 269 pages.

2 MacDiarmid SC. 1994. The risk of introducing exotic diseases of fish into New Zealand through the importation of ocean-caught Pacific salmon from Canada. MAF Regulatory Authority. 161 pages.

In response to submissions which criticised the risk analysis findings regarding streptococcosis, in particular the consequence assessment for this disease, MAF sought further expert opinion, and received three technical submissions on this subject from :

- Dr Colin Anderson, MAF National Centre for Disease Investigation. 16 December 1999. 3 page e-mail.

- Dr Brian Jones, Senior Fish Pathologist, Fisheries Western Australia. 20 December 1999. 2 page e-mail.

- Dr Mike Hine, NIWA. 22 December 1999. 3 page e-mail.

In section 5 of this document, MAF presents a summary of a significant piece of new scientific research of direct relevance to the biosecurity implications of trade in fish for human consumption.

3. REVIEW OF SUBMISSIONS

3.1 DEPARTMENT OF CONSERVATION

3.1.1 The risk to New Zealand's recreational fisheries and unique salmoniform natives is too uncertain, and is not justified by the benefits of imports.

3.1.2 The risk analysis contains insufficient information to convince the Department that the risk is low to negligible. As such, a precautionary approach should be taken.

MAF comment:

It is important to recognise this risk analysis as supplementary to the analyses performed by MAF in 1994 and 1997. Information presented in the 1994 and 1997 analyses remains relevant. In particular, the 1997 analysis contained thorough consequence assessments, quantified risk assessments with detailed consideration of exposure pathways (the model used to provide a quantified risk estimate is an updated version of the model developed in the 1994 analysis), and discussion of risk management measures. The principal objective of the current analysis was to examine the likely effect on risk from allowing a variation in the commodity definition (head-on, gill-in) for fish imported from Australia.

3.1.3 The risk analysis does not deal with diseases already present in New Zealand. Some of these are present on a very localised basis, so the importation of infected fish could be a way for them to spread around the country.

MAF comment:

A similar issue was raised in response to the 1997 MAF risk analysis. In the decision and review of submissions published in 1998, MAF responded by noting:

"It is the policy of MAF, in line with article 2.3 of the SPS agreement [the World Trade Organisation *Agreement on the application of sanitary and phytosanitary measures*], that sanitary and phytosanitary measures applied to imports will not be any more stringent than those applied domestically."

This means that if the presence of a disease in New Zealand has not resulted in statutory controls over movement of particular commodities, there is no justification to apply controls for similar imported commodities.

3.1.4 The Department considers that the risk to New Zealand from the proposed changes to the salmonid import restrictions outweighs any benefit.

MAF comment:

This issue was raised in response to the 1997 MAF risk analysis. In the decision and review of submissions published in 1998, MAF responded by noting:

"New Zealand government policy is that any person has the right to import goods subject to national legislation, the most relevant of which in this context is the Biosecurity Act 1993. The level and distribution of any benefits that might result is not an issue that MAF is able to take into account when processing applications to import. The only issues which MAF can consider when developing an import health standard are those relating to the biosecurity risks posed by organisms which might be introduced to New Zealand by imports permissible under the proposed standard."

3.1.5 The Department disagrees with the assessment that none of the pathogens except EHN represent more than a low risk, and even if it did concur with this assessment, considers a low risk to be too high to accept under the circumstances.

3.1.6 The Department is generally concerned about the lack of information available on the susceptibility of native fish to exotic diseases.

MAF comment:

It is true that there is limited information available on pathogens and parasites of native fish. One such report is noted in section 3.10.4, and it is further discussed in section 4 of this document. It suggests that morbidity in native salmoniform fish from opportunist bacterial infections does occur here.

In response to the 1997 MAF risk analysis, one detailed submission[3] considered more conclusions on the susceptibility of native fish can be drawn than is generally realised, supporting the view that non-salmonid salmoniform fishes are not particularly susceptible to salmonid parasites or diseases. The submission presented detailed information on parasites recorded from salmonids and native fish in New Zealand, derived from examination of many fish during the 1970s. The data demonstrate that although non-host specific species with widespread distribution have been detected from both salmonids and native fish, none of the parasites of salmoniform fishes with a narrow host range appear to have crossed into salmonids, despite such fish having similar diets. The submission also discussed a study into the leucocyte enzyme cytochemistry of 14 salmoniform species.[4] This study indicated that salmoniforms showed considerable diversity in their leucocytes such that their inflammatory and immunological responses would also be diverse, suggesting that salmoniformes are not necessarily predisposed to salmonid parasites.

3.1.7 The Department is concerned about the risk of picnickers taking fish to outdoor barbeque sites, with the head and other non-edible portions being disposed of directly or being transferred by scavenging birds into a salmonid environment.

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[3] Mike Hine, NIWA. Submission to the 1997 MAF *Import risk analysis: salmonids for human consumption*. 15 October 1997.

[4] Hine PM, Wain JM, Boustead NC. 1987. The leucocyte enzyme cytochemistry of fish. New Zealand Fisheries Research Bulletin No. 28. Ministry of Agriculture and Fisheries, 74 pages.

MAF comment:

These concerns were addressed within the detailed examination of exposure pathways (the means by which imported salmonid products for human consumption would contact a susceptible species) in the 1994 MAF salmon risk analysis. The suggested pathway was considered an unlikely route for disease introduction.

As a generalisation, picnickers tend to take foods that are either pre-prepared or require very little preparation prior to consumption. Very little processing takes place at the picnic site. If fish is to be barbequed in a picnic setting, it is likely to be either taken as foil-wrapped fillets or cooked whole. Even if it were to be consumed raw, such as Japanese-style sushi or sashimi , the initial preparation would probably occur in a kitchen. The principle exception to this would be fish caught and prepared on-site, but this obviously precludes imported product. In all probability, very few uncooked scraps are likely to result from a barbeque or picnic where imported salmonid product is consumed.

The 1994 MAF risk analysis also examined the likelihood of scavenging birds such as gulls being a means of transportation of scraps from dumps to waterways, both in the intestinal tract or on their bodies or feet. The internal body temperature of birds and the pH range of the gastrointestinal tract would not favour pathogen survival. The very low concentration of pathogen expected in a healthy carrier fish and the effect of environmental inactivation make this an improbable route of introduction.

3.1.8 There is no information on the infectious dose of epizootic heamatopoietic necrosis virus (EHNV) in native galaxiid fish to support the claim that an infectious dose would be unlikely to arise in the environment. The Department rejects the conclusion that the risks of EHNV can be managed by importation of salmonid product from Australia through any means other than cooking to inactivate any virus that may be present.

MAF comment:

Data on infectious dose were presented for redfin perch and rainbow trout. Redfin perch are the reservoir host and may be infected by relatively low concentrations following long-term bath exposure (28 days at 0.08 $TCID_{50}$/ml). Given the known epidemiology of EHNV, the most likely route by which the disease would be introduced and establish here is if redfin perch were infected as a result of product imports. If this occurred and led to periodic epizootics in this species, there would be potential flow-on effects for rainbow trout and possibly native galaxiids. It is this prospect that results in MAF's risk estimate and risk management recommendations. MAF does not consider that knowledge of the infectious dose for native fish would increase the accuracy of the risk estimate.

The regional distribution of EHNV in Australia is well-described. Importation of salmonid products from outside the endemic area is not considered to present a risk.

MAF considers the current risk management measures (implemented subsequent to the 1997 risk analysis) are just as appropriate for EHNV as for all the other pathogens

considered. MAF has recommended these be maintained for imports of rainbow trout from the EHNV endemic area of Australia.

The 1994 and 1997 risk analyses devoted considerable space to discussing the likelihood of pathogens achieving an infectious dose in local waterways following contamination from imported product.

3.1.9 There is insufficient information presented on the infectious dose of atypical *Aeromonas salmonicida* or potential risks to native fish to support the conclusion of negligible risk. The Department accepts that the amount of infectivity will be reduced through washing to remove mucus and evisceration. However, large scale processing of imported product would increase the risk, and so any post-arrival processing should take place in premises with appropriate waste management systems.

MAF comment:

The reliance on extrapolation from tissue concentration and infectious dose data relating to typical *A. salmonicida* is acknowledged. The quantification of risks in relation to typical *A. salmonicida* in the 1994 and 1997 risk analyses suggests a significant safety margin for any biological variation in these features as a result of strain variations.

Naturally occurring clinical disease has not been reported in Australian salmonids, suggesting that the release risk relates only to asymptomatic carriage. This is further reduced by evisceration and washing, because asymptomatic carriage most likely involves the gastrointestinal tract and the mucus. Given that the risk of release is very low, and the overall risk would be further reduced by naturally occurring dilution effects in the exposure pathways, MAF does not consider that the advocated measures to reduce the risk of exposure are warranted for product imported from Australia.

Note that point 3.10.3 in this review of submissions suggests that the existing surveillance information for atypical *A. salmonicida* in Australia may have led to an over-estimate of the risk of infected fish being harvested.

3.1.10 The uncertainty regarding aspects of the disease condition lymphosarcoma in Tasmanian Atlantic salmon demands a precautionary approach is taken to imports.

MAF comment:

The aetiology of lymphosarcomas in Tasmanian Atlantic salmon is unknown, and it has not been established that this condition has an infectious cause. Speculation on this issue has resulted from some similarities between the condition and plasmacytoid leukaemia in chinook salmon, for which salmon leukaemia virus is recognised as the causal agent.

AQIS have provided an expert opinion obtained from Dr John Harshbarger, Director of the Registry of Tumours in Lower Animals, on the likelihood of a relationship between lymphosarcomas (or lymphomas, as his review describes them) in Tasmanian Atlantic

salmon and chinook salmon plasmacytoid leukaemia.[5] Dr Harshbarger notes dissimilar histology of the two tumours, as well as epidemiological differences (the Atlantic salmon lymphomas have a long history of low prevalence, whereas chinook salmon plasmacytoid leukaemia is easily communicable and can be present at high prevalence in confined stock). He offers his opinion that they appear to be different diseases.

MAF considers this expert opinion affects a key aspect of the risk assessment for lymphosarcomas in Tasmanian Atlantic salmon. If the suggested causal link between this condition and chinook salmon plasmacytoid leukaemia is removed, this reduces the likelihood that severe adverse consequences for New Zealand's chinook salmon aquaculture industry could result from disease introduction. It would also remove an important consideration in the speculation regarding an infectious aetiology for the disease, which is crucial for any risk of introduction whatsoever to be ascribed to imports of product derived from dead fish.

3.1.11 The Department accepts that the level of streptococcosis infectivity associated with carrier fish is likely to be low, and would be reduced by evisceration. However, the Department does not accept that introduction of organisms causing streptococcosis would be unlikely to result in significant adverse consequences. *Streptococcae iniae* is an important bacterial pathogen of fish causing 50% mortality in stocks, and is also associated with human infections. The risk analysis has not provided sufficient information in support of the contention that organisms causing streptococcosis probably already occur here.

MAF comment:

S. iniae has not been isolated from salmonids in Australia. The bacterium has been isolated from barramundi (*Lates calcifer*) in Queensland. Salmonids do not occur naturally in Queensland, although there is one salmonid facility (stocked from interstate hatcheries) which is used for recreational fishing on site. [6] This information suggests that the risk of salmonids infected with *S. iniae* being harvested in Australia and exported to New Zealand is negligible.

The other issue raised, that of the potential consequences of introducing other organisms associated with streptococossis in fish, is addressed in Part II of this analysis.

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[6] John Harshbarger, Director, Registry of Tumours in Lower Animals, George Washington University Medical Center, Washington DC. Personal communication with Peter Durham, AQIS, 20 September 1999.

[7] Kahn SDA, Beers PT, Findlay VL, Peebles IR, Durham PJ, Wilson DW, Gerrity SE. 1999. Import risk analysis on non-viable salmonids and non-salmonid marine finfish. Australian Quarantine and Inspection Service.

3.2 NELSON BOUSTEAD, NIWA

3.2.1 The request to consider allowing import of head-on gill-in product into New Zealand from Australia is absurd for economic and marketing reasons. It appears to be motivated by political considerations, and reflects how negotiators have become out of touch with market realities.

3.2.2 Salmon is not sold as a gutted product with gills in. It is not preserved or sold as frozen product with gills in.

MAF comment:

While the point regarding gills is accepted for frozen or otherwise preserved salmon, some fresh salmon is certainly marketed with the gill in as these are used as an indicator of freshness. MAF has confirmed this point with salmon farmers in New Zealand [7], and authorities in Australia [8] and Norway [9], as well as the USA and Canada. The form of commodity traded is dictated by consumer demand, and this may vary from country to country.

3.2.3 At present, economically it makes no sense for Australia to export product to New Zealand given that prices are 90% higher in the Australian market. It is most unlikely that fresh product would be air freighted from Australia to New Zealand, the only scenario in which leaving gills in as a measure of freshness for marketing would be necessary.

3.2.4 There is world-wide acceptance that gilled and gutted product poses a reduced fish health risk to importing countries compared with whole product, as viscera and gills are primary sites for most fish pathogens. After allowing import of gilled and gutted product, to start distinguishing between gills and guts is not logical. In principle, gills pose a greater risk of carrying and transmitting fish pathogens than muscle and provide a reservoir for blood-borne disease.

MAF comment:

The Office International des Epizooties *International aquatic animal health code- 1997* (the Code) does not recommend measures during trade in eviscerated fish products for human consumption. The OIE Fish Diseases Commission considers such imports do not present a disease risk to the importing country.

The OIE's official standard setting role under the WTO SPS Agreement suggests that Code recommendations generally equate with "world-wide acceptance". The Code definition of eviscerated fish is removal of internal organs, excluding brain and gills i.e. head-on, gill-in fish. As such, the international standard reflects an accepted reduction in the risk of disease transmission associated with this form of product.

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[7] Micheal Field Hodgson, New Zealand Salmon Farmers Association. Personal communication with Martin van Ginkel, MAF. 26 October 1999.

[8] Vanessa Findlay, AQIS. Personal communication with Stuart MacDiarmid, MAF. 26 October 1999.

[9] Tore Håstein, Veterinærinstituttet, Norway. Personal communication with Stuart MacDiarmid, MAF. 3 November 1999.

3.3 NEW ZEALAND FEDERATION OF FRESHWATER ANGLERS (INC.)

3.3.1 The Federation strongly opposes the recommendations of the report as an unacceptable biosecurity risk to New Zealand's native and recreational fisheries.

3.3.2 The Federation does not consider that the Ministry of Agriculture and Forestry is competent to, or has the required expertise to, assess the risks of importations of piscine material and its effects of recreational fisheries. This is reinforced by the inane and inaccurate statements and the lack of objective scientific judgement in the report. Such assessments should be made by those statutory bodies charged with management of recreational fisheries, who at least know something about them. The report should be reviewed by overseas experts in the management of natural recreational fisheries.

MAF comment:

As already noted in section 3.1.2, it is important to recognise this risk analysis as supplementary to the analyses performed by MAF in 1994 and 1997. Those analyses were extensively reviewed by international fish health experts, with expertise in issues for aquaculture and wild fish populations. In 1997 an international fish health expert reviewed public submissions. All these reviews endorsed MAF's work, despite those analyses also being heavily criticised in submissions from stakeholders in the recreational fisheries.

3.3.3 The report makes no mention of any follow-up procedures that might result from its adoption, such as testing to monitor the threat of new diseases. Who would perform such tests, to what standards, how would results be reported, and would the surveillance be funded by MAF's budget?

MAF comment:

MAF has publicly available standards describing aquatic animal health surveillance and emergency response procedures if an exotic disease is suspected. The results of these activities are published by MAF. These activities form a part of MAF's core responsibilities, and MAF receives funding to undertake them.

3.3.4 The Federation considers the reference to trout in the risk analysis indicates a bias and philosophy within MAF that makes it inappropriate to arbitrate on such matters, because it is currently, and always has been, illegal to import such species.

MAF comment:

MAF's brief is to examine only the biosecurity risks associated with risk goods subject to import applications. MAF recognises that other factors may influence whether such goods may or may not be eventually be imported, and the conditions of importation.

However, MAF notes that the Customs Import Prohibition (Trout) Order currently allows importation of quantities of trout up to 10 kg for personal use, and that this is as yet a temporary measure. As such, MAF considers it necessary to consider the biosecurity risks associated with imports of trout.

3.3.5 The Federation contends that the risk analysis findings on EHNV are unsubstantiated supposition unrelated to the presented facts. The Federation does not accept the findings and considers the risks unacceptably high. The Federation further contends that the report's authors do not know enough about the relationship between recreational fisheries and these disease agents to draw valid conclusions regarding risks. This is highlighted by idiot statements in the report which confirm that MAF doesn't have the required competence or expertise in this subject to comment sensibly on it.

MAF comment:

Note point 3.3.2 above in response to criticism of MAF's competence.

EHNV has remained confined to a specific region of Australia, despite the lack of restrictions on movement of dead product from that region. All the evidence examined suggests that the likelihood of disease being spread from this region in eviscerated fish is very low, and this view is endorsed by fish health experts. MAF has recommended measures that will ensure the risk of introduction is negligible in recognition of the high level of protection considered appropriate for this serious disease, because of the potential for severe adverse consequences if it were introduced here.

3.3.6 The Federation contends that the risk estimate for atypical *A. salmonicida* is not supported by the presented scientific evidence.

MAF comment:

See point 3.1.9 above.

3.3.7 The Federation considers the conclusions regarding lymphosarcomas of Atlantic salmon to be scientifically indefensible as a result of the many unknowns about this disease.

MAF comment:

See point 3.1.10 above.

3.3.8 The Federation considers the conclusions regarding streptococcosis that rely on extrapolation of information on organisms already present in New Zealand to have no scientific validity.

MAF comment:

Streptococossis is addressed in section 4 of this document.

3.3.9 The section on exposure pathways is full of unsubstantiated generalisations, completely unsupported by empirical data or scientific fact. The Federation does not accept that valid conclusions can be drawn from unsubstantiated opinion.

MAF comment:

The 1994 MAF risk analysis examined exposure pathways for imported fish products to contact susceptible fish species in New Zealand. Experts were consulted in relevant aspects of fish importation, fish retailing, consumer behaviour, food preparation and waste management. The section in the supplementary analysis summarises this more detailed review, and referred to it.

3.4 FISH AND GAME NEW ZEALAND, NEW ZEALAND COUNCIL

3.4.1 Leaving the head on and gills in will result in a serious incremental effect on the overall risk to the New Zealand environment. The official reaction when some new pest or bug is discovered tends to be "oops – oh well, we have to live with that now!".

3.4.2 This analysis and previous reports show obvious bias. The potential risk to our recreational freshwater fisheries, no matter how small, is not worth it.

MAF comment:

MAF interprets the comment regarding bias as a suggestion that MAF considers trade issues take precedence over biosecurity issues. In 1998 MAF responded to similar criticisms in the review of submissions to the 1997 analysis, as follows:

"The New Zealand economy is heavily reliant on international trade, and the New Zealand government is committed to free and fair international trade and to maintaining an open, internationally competitive economy. The government supports the development of rules-based trade through agreements under the World Trade Organisation, and is moving rapidly to eliminate tariffs and other restrictions on trade.

One principle of rules-based trading is that health-protection measures should be only applied when necessary, and not as a disguised restriction on trade. One of the WTO agreements, the SPS agreement, establishes principles which WTO members are committed to uphold when they work to protect health while trading in plants, animals and their products. Under the article 5.1 of the SPS agreement, countries are obliged to ensure that their sanitary measures are based on a scientific assessment of risk, taking into account the risk assessment techniques developed by the relevant international organisations. For trade in aquatic animals and aquatic animal products, the guidelines for risk analysis are presented in section 1.4 of the *International aquatic animal health code* of the OIE.

The Biosecurity Act 1993 provides New Zealand's legislative framework for development of import health policy. Section 22 (5) requires chief technical officers to have regard for the likelihood that imported goods will introduce organisms into New Zealand, and the nature and possible effect on people, the environment and the economy of any such organisms introduced. Section 22 (6) requires MAF to consult with persons considered to be representative of the classes of persons having an interest in the issue examined when it develops or reviews import health standards.

MAF considers that the risk analysis process examining measures to be applied during importation of salmonids for human consumption has met New Zealand's international obligations and national legislative requirements. The recommendations within the risk analysis are considered by MAF to achieve New Zealand's appropriate level of protection against the risk of introducing aquatic animal diseases during importation of salmonids for human consumption."

Further, MAF interprets the comment to indicate a desire for import health policies pursuing a "zero-risk" approach. MAF considers pursuit of such policies to be contrary to international obligations arising from the WTO SPS Agreement. In practical terms, a "zero-risk" approach for diseases affecting aquatic animals would require closing the New Zealand border not only to imports of products, but to tourists, shipping and wild aquatic animals, which is clearly impossible.

3.4.3 The report basically says a variety of diseases will undoubtedly get into the country. The issue is whether they will be of sufficient concentration or the handling, processing or disposal methods in New Zealand will be such to allow them to get into waterways and cause infectious outbreaks.

MAF comment:

The exposure assessment (consideration of the biological pathways necessary for exposure of susceptible species in the importing country to the hazards released from a given source risk) is a necessary and integral part of the overall risk assessment, in accordance with the import risk analysis methodology described by the OIE.

3.4.4 The report suggests that it will serve recreational anglers right if the disease got into those areas (Rotorua and Taupo) because somebody purchased an overseas product because they will not agree to the commercial sale of trout in New Zealand. This tends to expose the attitude of officials in the development of this report and shows a blatant disregard of the political debate before Parliament.

MAF comment:

See point 3.3.4 above.

The OIE recommends the following issues (among others) be taken into account during the exposure assessment:

- human and animal demographics
- customs and cultural practices
- geographical and environmental characteristics
- quantity of commodity to be imported
- intended use of the imported animals or products.

In considering such factors MAF concluded many tourists are drawn to localities such as Taupo and Rotorua by the reputation of the recreational trout fishery, and that this may create an increased demand for trout products in restaurants in these areas. No other implication is intended.

The analysis acknowledged the existing Customs Import Prohibition (Trout) Order, and the proposal presently before parliament to permanently prohibit importation and sale of commercial quantities of trout in New Zealand.

3.4.5 The Council rejects the recommendations with respect to EHNV.

MAF comment:

See points 3.1.8 and 3.3.5 above.

3.4.6 Colin Anderson, MAF, documented the potential ways that disease could get into waterways during the intial debate on salmon importations. His views have been ignored.

MAF comment:

The 1994 analysis responded in detail to the issues regarding exposure pathways that Dr Anderson had raised.

3.4.7 The Council advocates a cost-benefit analysis approach to determining import policies when there are biosecurity risks.

MAF comment:

See point 3.1.4 above.

3.5 FISH AND GAME NEW ZEALAND, NORTH CANTERBURY REGION

3.5.1 The inclusion of the genera *Salmo* and *Salvelinus* is illegal and contrary to the intent of New Zealand laws that exlude the farming and sale of trout within New Zealand and the importation of trout except personal consignments of up to 10 kg. North Canterbury Fish and Game objects to the inclusion of trout in this risk analysis.

MAF comment:

See points 3.3.4 and 3.4.4 above.

3.5.2 In relation to imports of salmon, North Canterbury Fish and Game advises to always err on the side of caution and exclude the gills and internal organs, the main sites for parasites and diseases. The heads themselves appear acceptable as long as inspection processes are enforced.

3.5.3 North Canterbury Fish and Game considers there is a level of bias and false reasoning in the analysis discussion of EHNV. This disease alone should be grounds for refusal.

MAF comment:

See points 3.1.8 and 3.3.5 above.

3.5.4 Such reports can only lead to increasing contempt and suspicion of MAF by outside organisations such as Fish and Game for the obvious bias in the illogical scientific reasoning that always seems to surround these reports, especially on trade importations of fish products into New Zealand.

3.5.5 The submission refers to the importation of diseased pilchards from Australia which led to massive kills of fish around New Zealand's coastline, and asks has MAF not learnt from its past mistake?

MAF comment:

The reference is to the 1995 pilchard mortality that involved populations in Australia and New Zealand. In 1998 a similar mortality event occurred along the southern Australian coastline. Although the scale of the mortalities in Australia was unprecedented, large-scale mortalities involving pilchards have occurred on several occasions in New Zealand and Australian history.

The primary cause of the mortalities remains unknown. A herpesvirus was associated with dead and dying fish in both Australia (during 1995 and 1998) and New Zealand (during 1995), but its role as a primary pathogen has not been established. The pattern and rate of spread of the mortalities indicate that factors other than direct fish-to-fish transmission of an infectious agent are likely to be involved. Herpesviruses are relatively common, having been found in insects, reptiles, and amphibia as well as in virtually every species of bird or mammal that has been investigated. A common feature

of their biology is the tendency to remain latent (inactive and often unrecoverable within the tissues of the host) until stress reactivates infection.

In 1995, when investigators in Australia began to suspect an infectious cause and the possible presence of an exotic pathogen, MAF placed a ban on imports of pilchards from Australia. Despite this action, mortalities occurred in New Zealand waters.

In 1998, MAF considered whether there was scientific justification for measures during importations of pilchards from Australia, and decided not to impose further measures or a ban. The Australian State and Commonwealth governments were acting responsibly to ensure pilchard populations actively experiencing mortalities were not harvested.

There is no direct evidence linking the mortalities in either Australia in 1995 and 1998 or New Zealand in 1995 with imports of pilchards for human consumption, use as bait, or any other purpose. International trade agreements obligate New Zealand to scientifically justify trade measures, and to implement the least trade restrictive measures to provide an appropriate level of protection from disease risks.

3.5.6 While the disease risks are said to be low or negligible, why import at all if there is a small risk? By definition if the risk is low then it will happen albeit over a longer time frame. Why threaten our pure infection free multi-million dollar recreational fishery for the sake of a few selfish greedy local and foreign profiteers?

MAF comment:

See point 3.4.2 above.

The reference to the New Zealand recreational fishery as being “infection free” ignores the description of the health status of New Zealand fish as described in the 1997 MAF risk analysis.

3.6 TAUPO FISHERY ADVISORY COMMITTEE

3.6.1 The Taupo Fishery Advisory Committee finds the analysis to be flawed and incomplete, and disagrees with its findings. The Committee opposes the importation of fresh salmonids regardless of their being headless, gill-less or otherwise.

3.6.2 Not all diseases/disease agents of potential concern found in Australia and not in New Zealand have been included. An earlier MAF risk analysis for importation from Tasmania of salmonid offal for petfood discussed reovirus, *Vibrio tubiashi*, *Lactobacillus piscicola, Enterococcus seriolicida, Vagococcus salmoninarum, Cytophaga psychrophila, Flexibacter maritinus, Beauveria bassiana, Branchiomyces*, and *Ceratothoa*.

MAF comment:

In January 1998 MAF released an analysis of risks associated with importation of salmonid offal from Tasmania for processing into canned pet food in New Zealand (Biosecurity 1, 1 February 1998). MAF had proposed post-arrival risk management measures that would ensure containment from the time of importation until heat treatement at canning rendered the product safe. An import health standard was not issued as a result of this process because the proponent decided not to pursue the proposal further.

The hazard identification in that analysis relied on information considered in the 1997 MAF salmonid risk analysis. However, the nature of the two commodities discussed in these analyses (eviscerated fish for human consumption versus inedible offals) is vastly different. The inedible offal was expected to be heavily contaminated, including opportunist and environmental organisms that do not tend to cause disease without some external stressor.

This sharply contrasts with an eviscerated fish product that has passed inspection and grading and is fit for human consumption. The current supplementary analysis has concentrated on the four diseases caused by (suspected in the case of lymphosarcomas in Tasmanian Atlantic salmon) primary pathogens, known to be present in Australia, and with a reasonable likelihood of being present in the commodity under consideration. The bacterial and fungal diseases listed above tend to cause non-host specific infections in stressed fish.

With respect to the reovirus, see point 3.10.2 below.

3.6.3 Further, other diseases/agents mentioned in MAF's risk analysis but not examined in detail in that analysis have been examined in detail by AQIS. Their risk analysis would have assisted MAF in their decision-making on the request to allow head-on gills-in salmonid importation to make the correct decision.

MAF comment:

MAF is not certain which of the various risk analyses or diseases/agents the submission is referring to. However, all agents considered by AQIS to be a risk when

salmonids are imported have been considered in the 1994 and 1997 MAF risk analyses. The 1999 AQIS risk analysis considered several other organisms to be a potential risk when importing non-salmonid fish.

3.6.4 With this proposal MAF continues to increase the risk of salmonid diseases entering New Zealand and putting aquaculture, tourism and related industries worth $750 million at risk.

3.6.5 MAF suggests New Zealand has no choice in deciding whether to accept imports because we signed the SPS Agreement.

MAF comment:

The SPS Agreement describes the process for considering risks associated with import proposals but does not dictate the outcomes. Every country has the sovereign right to determine the appropriate level of protection from risk. However, the SPS Agreement places various obligations on countries considering import proposals. These include harmonisation with international standards; the use of science-based risk assessment; the implementation of least trade restrictive measures to achieve the appropriate level of protection; consistency in treatment of different commodities with like-risks; and ensuring measures applied to imported commodities do not exceed those for similar commodities traded domestically if the risks are similar.

3.6.6 By MAF's own admission throughout the 1997 risk analysis, removal of head and gills reduces the risk of introducing salmonid diseases.

MAF comment:

In general, this remains true. However, MAF is obligated to consider each market access request and the risks therein. After completing a risk analysis for head-on gill-in product from Australia, which has taken into consideration the health status of the regions and populations from which product would be derived, MAF considers New Zealand's appropriate level of protection can be achieved through the recommended measures.

3.7 NEW ZEALAND SALMON ANGLERS ASSOCIATION INCORPORATED

3.7.1 The Association can see no point in importing offal and fish parts that are not eaten as the risk of their accidental disposal into the wild or nearest waterway is so high.

MAF comment:

MAF has considered this proposal in response to an official market access request and in accordance with statutory and international obligations.

With regard to the risk of accidental disposal of uncooked scraps, refer to comments at point 3.1.7 above.

3.7.2 The Association assumes that the commodity definition is driven by the producers' desire to reduce processing costs and maximise retailing profits.

MAF comment:

Consumer demand will exert the major influence in the form of aquacultured salmonid commodities traded in the international market. This will presumably be affected by price considerations driven by many factors, including the above two. Aside from their impact on the likely volume of trade, these factors are outside the scope of this risk analysis.

3.7.3 The gills are a prime site for contamination by bacteria and insects (e.g. blowflies).

MAF comment:

The food safety or wholesomeness issues referred to are common to fish products produced in either Australia or New Zealand, and controlled by common food standards in our two countries. These issues are outside the scope of this risk analysis.

3.7.4 There is a risk that there could be a virus in Australia with no known side affects that could run riot in New Zealand.

MAF comment:

The SPS Agreement obligates MAF to base import risk analysis on current scientific knowledge. As a result, this risk analysis has concentrated on known agents in Australia and their likely impact in New Zealand. However, MAF recognises a further obligation to examine new information if it arises.

3.7.5 The submission suggests a range of methods for determining the freshness of a fish.

3.7.6 The Association is concerned that disease could be introduced through disposal of uneaten sushi meals in tourist packed lunches directly into New Zealand waterways.

MAF comment:

MAF has previously addressed the risk of disease agents in flesh. There is no additional risk from gills and heads in the above scenario because these are not used in sushi meals.

See also point 3.1.7 above.

3.8 TOBY WARREN, SOUTHFRESH LIMITED

3.8.1 Mr Warren commends the analysis for the good sense articulated in it.

3.8.2 Mr Warren notes his view that it is extremely unlikely that any or much Australian salmon will be imported into New Zealand given the absence of any competitive advantage compared with other salmon producing countries. Southfresh is unlikely to import salmon from Australia.

3.9 AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

3.9.1 AQIS considers these recommendations appropriate for this trade and consequently support the conditions and certification proposed.

3.10 DR BRIAN JONES, FISHERIES WESTERN AUSTRALIA

3.10.1 Dr Jones agrees with the risk analysis findings. He considers his comments reflect minor points of clarification.

3.10.2 For completeness, mention should be made of a reovirus that is occasionally isolated from Tasmanian salmonids. Its significance is unknown, but it is assumed to be harmless.

MAF comment:

Several other reoviruses known to affect salmonids were considered in the 1997 MAF risk analysis, and a conclusion of negligible risk was reached.

3.10.3 Many of the reports of atypical *A. salmonicida* in the late 1980s and early 1990s were based on an immunofluorescent antibody test available at the Australian Animal Health Reference Laboratory. This is certainly the case for many of the Western Australia records. Subsequent work has shown that the IFAT cross-reacts with other *Aeromonas* sp., so distributional records based on use of that test should not be relied on.

MAF comment:

Dr Jones is suggesting that records of Australian diagnoses of atypical *A. salmonicida* in the late 1980s and early 1990s may in reality reflect infections with common aquatic *Aeromonas* species such *A. hydrophila*, which occurs in New Zealand.

3.10.4 An outbreak of putative streptococcal disease among galaxiids occurred in Waikato in 1994.[10]

MAF comment:

See section 4 of this document for further discussion.

[10] Jones JB. 1994. Mortality of native fish from Waikato tributary: disease diagnosis. Dept of Conservation Advisory Science Notes 67:5 p.

4. FURTHER INFORMATION ON STREPTOCOCCOSIS

4.1 POINTS RAISED IN SUBMISSIONS

In response to submissions which criticised the risk analysis findings regarding streptococcosis, in particular the consequence assessment for this disease, MAF considered that the matter warranted further consideration, particularly considering that :

a) A putative outbreak of streptococcosis has been reported in New Zealand fish.[11]

b) *S. iniae* should be regarded as a primary pathogen capable of causing high mortalities in fish stocks, and as an important zoonosis. As this species has not been recorded in New Zealand, the risk analysis' assertion that opportunistic bacterial pathogens present here probably already fulfil a similar role to those causing streptococcosis in other countries may not be correct.

4.2 FURTHER EXPERT OPINION

Therefore MAF sought further opinion on this matter from experts with relevant New Zealand experience.

MAF requested experts to comment on the following aspects of streptococcosis:

i) The known range of bacterial isolates from fish (or other aquatic species) in New Zealand that would be capable of causing bacterial infections under the umbrella of "streptococcosis".

ii) Whether this is likely to be an accurate reflection of New Zealand's health status, given limited surveillance activity in this area (for instance, how far would identification of Gram-positive cocci typically proceed during routine diagnostic procedures?). In particular, what would be the likelihood that a wider range of species, perhaps even including *S. iniae,* might be present here in wild, ornamental or marine fish, but undetected to date.

iii) Based on the responses to the above, how accurate is MAF's consequence assessment at 3.4.5 of the risk analysis.

4.3 EXPERT OPINIONS ON STREPTOCOCCOSIS

4.3.1 Colin Anderson, MAF NCDI

4.3.1.1 We isolated a *Streptococcus sp*. from the spleen of one of three, 11 month old, 30 gm sockeye salmon from a hobby farm at Prebbleton in the summer of 1985. The most prominent clinical sign was protrusion and haemorrhage of the eye, most often bilateral. Bacteria were not detected in the disrupted tissue which contained retinal pigment granules and pyknotic debris. The *Streptococcus* isolate was

injected intraperitoneally into both sockeye and quinnat salmon fingerlings held at the laboratory. Only one salmon died and *Streptococcus* was not re-isolated. We concluded that the S*treptococcus* sp. isolated was non-pathogenic and an incidental finding.

4.3.1.2 Regarding the native fish case report by Brian Jones, the gross signs would fit a range of conditions and, with the exception of skin ulceration, are not those that review articles report as the most commonly occurring signs of streptococcosis. With damage to the external barriers (skin and gills) non-specific secondary invaders would be expected to enter i.e. the cocci and rods seen on histology. It is unfortunate that efforts were not made to obtain more fish for isolation, identification and evaluation of the pathogenicity of the microbes present.

4.3.1.3 The evidence presented in the above cases would not support a contention that streptococci pathogenic for fish have been detected in New Zealand.

4.3.1.4 Regarding surveillance for pathogenic gram positive bacteria, there has been field inspection and laboratory testing at our laboratory of salmon and limited numbers of wild fish for over two decades.[11] [12] Streptococcal bacteria will generally grow well on blood agar and during identification will stand out among the predominant gram negative bacterial flora of fish. They are comparatively easily identified to the streptococcal level, although taking them further to *Enterococcus*, *Lactococcus*, etc. is more difficult. However, isolation of gram positive cocci from New Zealand fish is comparatively rare in our experience. In summary, I believe our surveillance would have identified pathogenic streptococci if they were present in South Island salmon environments.

4.3.1.5 Our surveillance of fish in the North Island has been much less extensive than for salmon in the South Island. However, trout reproductive products and in some cases live fish are collected from the wild and reared intensively in sport fish hatcheries where disease agents if present should multiply, be maintained and become apparent. Thus a number of catchments have effectively been sampled for fish disease agents over many years. For over two decades MAF has routinely inspected trout hatcheries in the North Island and provided a disease diagnostic service when disease is suspected. The hatcheries have also participated in disease surveys that have contributed to the published data on health status of New Zealand fish.

4.3.1.6 Small numbers of ornamental fish have been examined by histopathology and bacteriology. Pathogenic streptococci have not been implicated as causing disease in these investigations.

4.3.1.7 I believe it would not be correct to assume that a wider range of organisms associated with streptococcosis in other countries may also occur here already but have gone undetected to date. Our surveillance to date has not detected pathogenic streptococcal agents.

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[11] Anderson C. (1996). Distribution of salmonid diseases in New Zealand. *Surveillance*. 23 (4): 23-24.

[12] Anderson C, Knowles G, de Lisle G. (1994). A survey for *Yersinia ruckeri* and *Aeromonas salmonicida* in farmed and wild fish. *Surveillance*. 21 (3): 39-40.

4.3.1.8 I agree that streptococcal agents are less economically and environmentally significant fish pathogens than for example *R. salmoninarum*, viral haemorrhagic septicaemia virus and infectious haematopoietic necrosis virus. However, streptococcal agents are considerably more economically and environmentally significant than the disease agents known to occur in New Zealand (*Vibrio ordalii, Aeromonas hydrophila, Hafnia alvei* and *Nocardia asteroides*).

4.3.1.9 The proposal is to import eviscerated fish. Evisceration will remove organs of the highest infectivity but organs of equivalent or greater infectivity will remain i.e. brain and kidney remnants. These organs in fish that have passed inspection on the processing line but are in the early septicaemic phase or carriers would likely contain multiple infectious doses if eaten by susceptible fish species. The feeding of wild caught trash fish to farmed yellow tail in Japan is thought to be one of the sources of streptococcal infection in this industry.

MAF comment:

The proposal is to import eviscerated fish products for human consumption. A full discussion of exposure pathways for such products to contact susceptible species in New Zealand, and the risk reduction effects therein, was part of the 1994 MAF risk analysis.

4.3.1.10 It is not possible to be 100% certain but in my view the available information supports a position that streptococcal bacteria pathogenic for finfish are not present in New Zealand at this time. Streptococcal agents overseas cause very significant pathology and economic loss and there are emerging zoonotic problems. New Zealand aquaculture is likely to expand in the North Island with the farming of fish species which may be more susceptible than salmon to streptococcosis and the warmer water environment will favour some 'streptococcal' species. In my opinion the risk of introduction and the adverse economic effects on aquaculture/native fish/public health is more than negligible.

4.3.2 Mike Hine, NIWA

4.3.2.1 The range of bacterial isolates capable of being classified as streptococcosis in New Zealand from past investigations involves the sole report by Brian Jones. In that paper, identification of the organism concerned as *Streptococcus* relies on the morphology and Gram-staining of the bacteria, which could be from one of many genera. This report is unlikely to reflect the current status of streptococcosis in New Zealand fishes, or in the country itself.

4.3.2.2 Streptococcosis has been reported in fish from the Far East, the United States, South Africa, Australia, Israel and Europe. At least 5 different species are pathogenic to fish (*Streptococcus iniae,* (syn. *S. shilot*), *Streptococcus agalactiae* (syn. *S. difficile*), *Lactococcus garvieae* (syn. *Enterococcus seriolicida*), *Lactococcus piscium, Vagococcus salmoninarum*).[13] Of these, the only species

[13] Bercovier, H., Ghittino, C., Eldar, A. (1997). Immunization with bacterial antigens: infections with streptococci and related organisms. Dev. Biol. Stand. 90: 153-160.

for which New Zealand surveillance information is available is *S. agalactiae*, because it causes sepsis in the newborn and mastitis in cattle (Diana Martin, Institute of Environmental and Scientific Research Ltd, pers. comm. to M. Hine). Although ESR monitors soil and water as well as hospital isolates, it is primarily concerned with enterococci in water contaminated by sewage or other animal waste. None of the other species has been isolated. The only possible conclusion is that no reliable data are available to definitively describe New Zealand's health status for fish pathogenic streptococci.

4.3.2.3 The submission provided information from the USA regarding streptococcal isolates from fish and humans (Diana Martin, Institute of Environmental and Scientific Research Ltd, pers. comm. to M. Hine). This information suggests that nonhaemolytic group B streptococci from fish have all been serotype 1b, which are somewhat different than the nonhaemolytic group B streptococci from humans. The isolates of *S. iniae* from fish and humans are alike. *Vagococcus fluvalis* has been isolated from humans and fish, although comparison of the isolates has not been undertaken. *Lactococcus garvieae* is isolated from humans pretty regularly.

4.3.2.4 The freezing tolerance of streptococci varies widely among species.[14] [15] Infected "head-on" fish, whether chilled or frozen, are likely to bring viable organisms into the country. However, there are no reports of these organisms being introduced into importing countries from trade in product.

4.3.2.5 Although *S. iniae* may cause cellulitis and endocarditis in humans[16], it is unclear whether fish and human isolates are the same[17] (notwithstanding information from the USA referred to above) and it is not considered a serious public health risk.[18]

4.3.2.6 I conclude that *S. iniae* and related organisms do not pose a significant risk to the health of fish or humans in New Zealand, and that the risk from importation of head-on, gill-in salmonids is acceptable

4.3.3 Brian Jones, Fisheries Western Australia

4.3.3.1 Species identified as fish pathogens include *L. garvieae* (= *E. seriolicida*); *L. piscium*; *S. difficilis*; *S. iniae*; *S. milleri*; *S. parauberis* and *Vagococcus salmonarum*. Streptococcosis has been reliably reported from USA, Venezuela,

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[14] Jakubowska, J., Libudzisz, Z., Piakiewicz, A. (1980). Evaluation of lactic acid streptococci for the preparation of frozen concentrated starter cultures. Acta Microbiol. Pol. 29: 135-144.

[15] Wouters, J.A., Rombouts, F.M., de Vos, W.M., Kuipers, O.P., Abee, T. (1999). Cold shock proteins and low-temperature response of *streptococcus thermophilus* CNRZ302. Appl. Environ. Microbiol. 65: 4436-4442.

[16] Weinstein, M.R., Litt, M., Kertesz, D.A., Wyper, P., Rose, D., Coulter, M., McGeer, A., Facklam, R., Ostach, C., Willey, B.M., Low. D.E. (1997). Invasive infections due to a fish pathogen, *Streptococcus iniae*. *S. iniae* Study Group. N. Engl. J. Med. 337: 589-594.

[17] Dodson, S.V., Maurer, J.J., Shotts, E.B. (1999). Biochemical and molecular typing of *Streptococcus iniae* isolated from fish and human cases. J. Fish Dis. 22: 331-336.

[18] Durborow, R.M. (1999). Health and safety concerns in fisheries and aquaculture. Occup. Med. 14: 373-406.

England, France, Italy, Spain, Greece, Israel, South Africa, Australia, Thailand, China and Japan. [19] [20]

4.3.3.2 Streptococcosis is easily diagnosed in clinically infected fish by the presence of chaining gram-positive cocci in all of the haematopoetic tissues. However, identification of the causative organism to species is more problematic as it requires culture. The report in 1994 indicated that, although chaining gram-positive cocci were seen associated with lesions in histological section, the identity of the organism causing the streptococcosis could not be determined. Since this was a disease among native fish in a tributary of the Waikato River, it is likely that other naturally occurring outbreaks have occurred and not been investigated.

4.3.3.3 Four cases of invasive infection of humans by *S. iniae* following preparation of imported whole fresh tilapia have been reported from Canada.[21] The tilapia were all sourced from US fish farms. Therefore, zoonotic infection by this route is clearly possible though described as 'rare' by the authors. *S. iniae* is believed to be a tropical soil associated bacteria which infects fish exposed to contaminated muddy freshwaters. It is likely to be a common pathogen in tropical freshwater and estuarine fishes following immuno-depression.

MAF comment:

The above information suggests that salmonids from temperate areas are unlikely to be a source of *S. iniae* isolates.

4.3.3.4 The report of serious epizootics of *S. iniae* in barramundi in Queensland[22] is contested by Queensland Department of Primary Industry (Ian Anderson, Principal Veterinary Pathologist Fish Diseases, Oonooba Veterinary Laboratory, Townsville Queensland, pers. com. with B. Jones). He reports that the information gathered by the Queensland Environmental Protection Agency and Queensland Department of Primary Industry does not support the claim that there has been an increase in marine sea-pen fish kills in Queensland caused by *S. iniae*. Rather, oxygen depletion caused by organic detritus in run-off following unusually high rainfall is the most likely cause of the deaths. Dr Anderson states "the isolation of a ubiquitous environmental bacteria from moribund fish does not consititute a diagnosis in our opinion. At all times, in tropical aquatic animals, isolation of a bacteria must be supported by confirmatory histopathology".

MAF comment:

While not refuting the presence of *S. iniae* in Queensland, these comments question its significance as a primary fish pathogen there.

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[19] Austin B, Austin DA. (1999). Bacterial fish pathogens. 3rd edition, Springer-Praxis.

[20] Eldar A, Ghittino C. (1999). Diseases of Aquatic Organisms 36:227-231.

[21] Weinstein *et al*. (1997). New England Journal of Medicine 337(9): 589-594.

[22] Bromage ES, Thomas A, Owens L. (1999). Diseases of Aquatic organisms 36: 177-181.

4.3.3.5 The Tasmanian salmonid isolate of streptococcus is phenotypically most closely related to a strain from an English goldfish isolate[9] suggesting that ornamental fish may have a role in the spread of this syndrome. Thus, the risk associated with importing streptococcosis on Australian salmonids should be assessed as part of a wider risk associated with importation of ornamental and other fresh seafoods generally.

4.3.3.6 I agree with the assessment in 3.4.5 that the prevalence of streptococcosis in imported eviscerated fish will be very low; that the risk of an infectious dose arising is low; and that the consequences to the environment and industry of an introduction would be negligible.

5. NEW INFORMATION OF GENERAL INTEREST

5.1 BACKGROUND

Many of the submissions MAF has received from domestic stakeholders during this and previous consultation have expressed concern that not enough is known to rule out the risk that the importation of salmonids constitutes a significant disease threat to local fish stocks. In earlier risk analyses MAF detailed at length what is known and what can be deduced about the disease risks. However, since those earlier analyses were conducted new scientific information has come to hand[23], adding weight to the belief that trade in dead salmonid fish does not constitute a disease risk.

5.2 RISK OF TRANSMISSION OF IHN

Dr Scott LaPatra and colleagues in the United States have recently conducted experiments to assess the risk that infectious haematopoietic necrosis virus (IHNV) could be transmitted in processed fish. A hundred specific-pathogen-free rainbow trout were experimentally infected by injecting them intraperitoneally with IHNV. They were held in an aquarium. A total of 33% of the infected fish died. Ten days after the last mortality six fish were sacrificed each week for 10 weeks. Kidney and brain homogenates from individual fish were tested by virus isolation and PCR gene. All tissue homogenates were negative for IHNV.

In another study Dr LaPatra and colleagues examined 240 aquacultured fish (225 - 500 g) exhibiting the spinal curvature or spinal compression deformities associated with IHNV infection. Since internal organs are absent following processing of fish for food products, a portion of the skin and muscle in the area of the deformity as well as brain tissue from each fish was collected and tested by virus isolation and PCR techniques. All brain and skin-muscle homogenates were negative for IHNV, independent of the type of deformity.

These results provide scientific evidence that there is little risk associated specifically with the movement of processed rainbow trout from an IHNV endemic area and, more generally, supports the conclusion that trade in salmonid fish in general is unlikely to constitute a disease risk.

[23] Scott LaPatra, Clear Springs Food Inc. Research Division. Personal communication with Stuart MacDiarmid, MAF December 1999.

6. CONCLUSIONS

6.1 STRONG OPPOSITION FROM RECREATIONAL FISHERIES GROUPS

Stakeholders with an interest in New Zealand's recreational fisheries remain strongly opposed to imports and are highly sceptical of MAF's motives for undertaking this new piece of work. In summary, in their submissions they :

- argue that the benefits of imports were insignificant relative to the disease risks;
- question the credibility and impartiality of the analysts;
- place strong emphasis on points of uncertainty, particularly where biological data for pathogens were incomplete; and
- advocate a zero risk approach to decision-making under the broad umbrella of the precautionary principle.

6.2 NO SIGNIFICANT NEW EVIDENCE

The value of New Zealand's recreational fishery has been emphasised by stakeholders, as has been the potential impacts of disease introduction. However, the potentially severely adverse consequences of a disease introduction have been acknowledged in this and previous MAF risk analyses.

Submissions did not revealed any evidence which contradicted the original conclusion that any risk of disease introduction is very low. With regard to the potential consequences associated with introduction of streptococossis, there are minor differences in opinion amongst the experts consulted.

None of the points raised in submissions affect the overall validity of the conclusions in this supplementary analysis, or the risk analyses that have preceded it.

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