Ministry for Primary Industries
Manatū Ahu Matua

Risk Management Proposal

Turkey Meat and Turkey Meat Products

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New Zealand Government

Growing and Protecting New Zealand

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1 Purpose

(1) The purpose of this document is to:

a) Show how options for the management of risk organisms have been assessed; and
b) Provide recommendations for import requirements.

2 Background

(1) Turkey meat and turkey meat products are considered a risk commodity, with the potential to harbour exotic viral and bacterial diseases. In April 2011, the Ministry for Primary Industries (MPI) released the *Import Health Standard (IHS) Turkey Meat and Meat Products* to effectively manage the risks associated with importation of turkey meat and turkey meat products. The recommendations in the IHS were developed using the *Import Risk Analysis (IRA): Turkey Meat 2011*.

(2) In 2015 the IHS, has been amended and reformatted in accordance with MPIs' Requirements and Guidance Programme (RGP) and updated to reflect changes to the organisations name, so any reference to the former Ministry of Agriculture has been replaced by MPI.

(3) As at June 2015, there are no countries approved for trade in turkey meat under the IHS however negotiations are underway with trading partners. The first step in negotiations involves Chief Technical Officer (CTO) assessment and approval of exporting country systems as they relate to poultry. The CTO assessments will be based on the World Trade Organisation Terrestrial Animal Health *Code* (the *Code*) section 3, Quality of Veterinary Services. Negotiations will take into account the verifiable health status of the exporting country, the national systems, legislation and IHSs in the exporting country for regulatory oversight of the poultry industry, and the capabilities and preferences of the exporting country's Competent Authority.

(4) Negotiations will also involve approval of a bilaterally agreed country-specific veterinary certificate. As they become available, the country-specific veterinary certification for trade in turkey meat and turkey meat products will be placed into the guidance document (GD) issued by MPI as an accompaniment to the IHS.

3 Objective

(1) The objective is to effectively manage biosecurity risks associated with the import of turkey meat and turkey meat products, consistent with New Zealand's domestic legislation and international obligations.

4 Options assessment

(1) Under Article 3.3 of the World Trade Organisation Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement), risk management measures which provide a level of protection greater than provided by international standards may be imposed only when they can be scientifically justified on the basis of a risk assessment.

(2) For a detailed analysis of potential hazards and their risks please refer to the IRA which contains the relevant risk assessment and an analysis of management options for each risk organism.

(3) Of the potential hazards, the IRA concluded that risk management measures were justified for the following risk organisms in imported turkey meat:

a) Newcastle disease virus
b) Highly pathogenic notifiable avian influenza
c) Salmonella arizonae

In addition to the above hazards, risk management measures were justified for the following hazards in imported entire turkey carcasses:

a) Avian paramyxovirus-2 and -3
b) Turkey coronavirus

c) The aetiological agent of turkey viral hepatitis

(4) The greater number of potential hazards associated with entire turkey carcasses reflect potential inefficiencies associated with evisceration and lung removal machinery used during commercial automated processing of turkeys.

(5) This document is an update of the *Risk Management Proposal (RMP): Turkey Meat and Meat Products 2011*, and discusses any proposed amendments to the IHS. For discussion of organisms where no risk management measures are recommended, see the IRA.

5 General requirements

5.1 Application

(1) The IRA scope included meat, meat products and carcasses under the one term, turkey meat. For the purposes of the IHS the commodity is classified as turkey meat and turkey meat products. Meat products are defined in Schedule 2 of the IHS. The scope of the commodity is included in the IHS in Part 1, under application.

(1) The IHS applies to:

a) Whole turkey carcasses that have been subjected to routine evisceration procedures. This may be uncooked, unskinned, and may include the head and feet.
b) Bone-in turkey meat and turkey meat products such as wings or legs.
c) Boneless turkey meat and turkey meat products such as breasts and boned-out thighs.
d) Reconstituted turkey meat and turkey meat products comprised of meat and skin.

(2) Turkey meat and turkey meat products must be derived from any member of the domesticated avian sub-species *Meleagris gallopavo gallopavo*.

(3) The IHS 2011 had a requirement for the meat to be derived from birds aged 8 weeks or older. Following further feedback from trading partners it is proposed to remove this requirement as turkeys will usually be slaughtered after this age and specifying the age will not affect the risk management provided by the IHS. The RMP 2011 did state the following:

> *A lower age limit of 8 weeks for birds slaughtered for export has been specified in the standard. Although the Import Risk Analysis: Turkey Meat did not specify an age range in the commodity definition, it was assumed that birds would be at least eight weeks old at slaughter (see Chapter 14 of the IRA). There is no risk management justification for an upper age limit for birds slaughtered for export.*

(4) This reference is to the IRA Chapter for Astroviruses which states:

> *Commercial turkeys are likely to be slaughtered at or after eight weeks of age (MAF 1999) so there is a negligible likelihood of virus being present in turkey meat when birds are slaughtered. Astroviruses are not assessed to be a potential hazard in the commodity.*

(5) As the IRA concludes astroviruses are not assessed to be a potential hazard in the commodity there are no additional measures (such as specifying a lower age limit) required.

5.2 Exporting country systems and certification

(1) All turkey meat and turkey meat products must be derived from a production system that is approved by an MPI Chief Technical Officer (CTO).

(2) Production system approval requires a production system outline to be submitted to a CTO. This must meet the requirements as detailed in Schedule 3 of the IHS and be endorsed by the exporting country's Competent Authority. In the case of a specific disease free compartment, a Competent Authority endorsed biosecurity plan must be submitted to the CTO. Approved production systems and compartments will be listed in the guidance document.

(3) CTO approval of the production system outline (and biosecurity plan, where applicable) is required prior to preparation of product for export to New Zealand. MPI reserves the right to audit facilities from countries approved to export product to New Zealand either during the approval process or anytime thereafter.

(4) The IHS 2011 had the requirement for an import permit to be gained prior to import which would indicate the product to import was from an approved production system, however this requirement has been removed as the approved production system and/or compartment(s) will be listed in the guidance document. A permit to import is only necessary if there are any CTO directions recognising effective risk mitigation measures different to those in the IHS (equivalence).

(5) For exporting countries that MPI does not have existing arrangements with, MPI may choose to undertake in-country assessments and/or audit of production systems prior to approval. The in-country assessment will assist in determining if the exporting country has animal and/or public health controls which provide the assurances the IHS requires for import of product to New Zealand.

(6) Compartment freedom requirements will be specific to a particular organism and production and processing system. Compartments will only be approved after MPI assessment of submissions in accordance with the OIE *Code*'s Chapters for Zoning and Compartmentalisation and Application of Compartmentalisation.

(7) Disease free zoning arrangements will need to be supplied to the CTO for agreement by the Competent Authority of the export country, before the option for a zone free from disease can be certified. Approved disease free zones will be listed in the guidance document.

5.3 Diagnostic testing and vaccination

(1) The IHS 2011 either specified the diagnostic tests to be used or required the tests used to be prescribed in the OIE *Manual*. It is proposed that the wording throughout the IHS be amended to require all diagnostic tests to be approved by MPI and listed in the document, *Approved Diagnostic Tests, Vaccines, Treatments and Post-arrival Testing Laboratories for Animal Import Health Standards* (MPI-STD-TVTL). This is because MPI understands that the OIE *Manual* will be moving away from prescribing diagnostic testing for international trade in the future. MPI approved diagnostic tests must be either described in the OIE *Manual* or will only be approved after consultation with MPI Investigation and Diagnostic Centre (IDC) laboratory experts. Tests must be considered by IDC as valid for diagnostic purposes in turkeys and must be appropriate for surveillance for the identified risk organism.

(2) In some instances the IHS requires flock testing to demonstrate freedom from disease. Instead of specifying the number of birds to be tested the IHS makes reference to testing a randomly selected, statistically valid sample to demonstrate flock freedom from disease. A specific sample size is not specified as this will depend on the sensitivity and specificity of the tests used and the expected prevalence of disease in the flock. This information should be provided when the tests are considered for approval by MPI. The IHS requires a sample size to be sufficiently large to give 95% confidence of detecting infection where there is at least a 5% prevalence in the flock, unless otherwise stated. Where a test's sensitivity is 99%, 60 samples will be sufficient to provide 95% confidence of detecting infection where there is a prevalence of at least 5% in a population of 500 or more. Suitable sample sizes can be calculated at the following website: http://epitools.ausvet.com.au/content.php?page=FreedomSS&Prevalence=0.05&dpaType=0&Sens=0.99&seh=0.95&Population=500

(3) MPI recommends allowing for some flexibility to the timing of slaughter tests and 7 days has been included in the IHS, to enable practical obstacles to testing to be managed by the exporter.

5.4 Processing

(1) Every turkey must be slaughtered in an abattoir approved by the Competent Authority for export of the product to New Zealand, and pass ante-mortem and post-mortem inspection deemed by MPI as equivalent to those set out in the *Code* Chapter 6.2 (Control of biological hazards of animal health and public health importance through ante- and post-mortem meat inspection).

(2) The abattoir and processing plant must operate Good Manufacturing Practice (GMP) and Hazard Analysis and Critical Control Point (HACCP) programmes to the satisfaction of the Competent Authority.

5.5 Packaging and storage

(1) Cross contamination risks are addressed in this section. Specific detail on the management of cross contamination will be provided to MPI in the production system outline. The requirements for the production system outline are detailed in Schedule 3 of the IHS.

5.6 Retorted product

(1) Retorting is a recognised method of ensuring that imported product is free from all risk organisms and is provided as an option for importers of turkey meat and turkey meat products. The IHS: *Importing Specified Foods for Human Consumption Containing Animal Products* is the specific IHS for retorted product and a link to this IHS will be included in the IHS for turkey meat and turkey meat products.

5.7 Food and Animal Products Acts

(1) Guidance relating to the Food Act 1981, Food Act 2014 and Animal Products Act 1999 is included in the IHS and guidance document.

6 Considerations for specific requirements for identified risk organisms

Specific requirements for identified risk organisms are located in Part 2 of the IHS

(1) It should be noted that for each risk organism, specific risk management requirements are specified in Part 2 of the IHS using the general form:

a) Country, zone or compartment freedom; or
b) Specified measures to verify premises and/or flock freedom; or
c) Specified thermal treatment(s).

(2) All three options are recommended as effectively managing risk, and will be included in the IHS for turkey meat and turkey meat products.

(3) The requirements set out in the IHS reflect the requirements summarised in the IRA: Turkey meat. Where specific Articles of the *Code* have been referred to in the IRA: *Turkey meat* the IHS will not state these, as Article numbers may change with each *Code* review. Instead the *Code* is legally incorporated by reference in the IHS and the latest version of the *Code* should be used.

(4) The Competent Authority will need to certify that the birds have been slaughtered in accordance with the *Code*, in an abattoir approved for export of turkey meat and turkey meat products to New Zealand. Birds must be certified as having passed ante-mortem and post-mortem inspection. These two declarations will be stated in Part 1 (General Requirements) of the IHS, and shall be included in the veterinary certification. These statements are reflective of the *Code* Articles for both Newcastle Disease (ND) and Highly Pathogenic Notifiable Avian Influenza (HPNAI), pertaining to fresh meat of poultry.

7 Recommendations for identified risk organisms

7.1 Newcastle disease virus

7.1.1 Options presented in the *Import Risk Analysis: Turkey Meat*

(1) Imported turkey meat could be derived from birds kept in a country, zone or compartment free from Newcastle disease virus (NDV) since they were hatched or for at least the 21 days before export.

Freedom could be based on surveillance in accordance with Articles 10.13.22 to 10.13.26 of the *Code*.

(2) Vaccination in flocks could be permitted using an inactivated APMV-1 vaccine or a live lentogenic virus strain which is shown to have an intracerebral pathogenicity index (ICPI) < 0.7.

(3) Meat derived from flocks where virus isolation or a validated molecular test has demonstrated freedom from NDV at slaughter could be considered eligible for import.

(4) Turkey meat to be imported could be cooked at 80°C for 5 minutes or 70°C for 30 minutes.

(5) Turkey meat to be imported could be cooked at 80°C for 203 seconds or 70°C for 574 seconds.

7.1.2 Options assessment and considerations

(1) MPI consider the proposed risk management options 1, 2, 4 and 5 for this disease to be appropriate to effectively manage the risk.

(2) In order to remain aligned with the requirements for poultry meat in the *Code*, option 2, demonstration of flock freedom by testing at slaughter has not been included in the IHS.

(3) Cooking requirements for turkey meat and turkey meat products are to be based on the most recent *Code* recommendations for inactivation of paramyxoviruses in meat. The time/temperature parameters will not be listed in the IHS as they may be updated in the *Code*. The *IRA: Turkey Meat* states these cooking time and temperature parameters could be accepted as an option to mitigate the risk of NDV in turkey meat and turkey meat products.

(4) The intracerebral pathogenicity index (ICPI) test is relatively insensitive when applied to viruses with low pathogenicity and, as an alternative, F0 cleavage site sequencing can be used for differentiating strains. However, although the demonstration of the presence of virus with multiple basic amino acids at the F0 cleavage site confirms the presence of virulent or potentially virulent virus, failure to demonstrate multiple basic amino acids at the F0 cleavage site using molecular techniques does not confirm the absence of virulent virus. Because of this the clause proposed for this amendment no longer refers to the FO cleavage site, but requires that any vaccines used to be derived from a master seed virus with an ICPI<0.4.

(5) As all strains of APVM-1 recovered in New Zealand have an ICPI<0.7 the ICPI of the master seed virus strains used to develop the vaccine should have an ICPI that does not exceed 0.4. This is discussed in the OIE Manual as follows:

> *The OIE Biological Standards Commission similarly recommended in 2000 that in principle vaccines should have an ICPI <0.7. However, in order to account for interassay and interlaboratory variability a safety margin should be allowed so that vaccine master seed virus strains should not have an ICPI exceeding 0.4*.

7.1.3 Requirements recommended for the import health standard

(1) The turkey meat or turkey meat products must be derived from flocks:

a) Kept in a country, zone or compartment free from Newcastle disease (ND) since hatching or for the 21 days before slaughter for export, with the *Code* surveillance requirements being met to claim freedom; and
b) With a vaccination status of:

i) not vaccinated ND; or
ii) vaccinated using an inactivated vaccine for ND; and/or
iii) vaccinated with a live lentogenic vaccine strain where the master seed virus has been demonstrated to have an intracerebral pathogenicity index (ICPI) not exceeding 0.4; or

(2) The turkey meat or turkey meat products must be cooked in accordance with the *Code* recommendations for inactivation of NDV in meat.

7.2 AVIAN PARAMYXOVIRUSES 2 AND 3 (APMV-2 AND APMV-3)

Options presented in the risk analysis:

(1) Turkey meat products that do not contain remnants of intestinal or respiratory tissue could be considered eligible for importation.

(2) Imported turkey carcasses could be derived from birds kept in a country, zone or compartment free from avian paramyxovirus-2 (APMV-2) and avian paramyxovirus-3 (APMV-3) since they were hatched or for at least the 21 days before export.

(3) Carcasses derived from flocks where virus isolation has demonstrated freedom from APMV-2 and APMV-3 at slaughter could be considered eligible for import.

(4) Imported turkey carcasses could be cooked to a core temperature of 80°C for 5 minutes or 70°C for 30 minutes.

(5) Imported turkey carcasses could be cooked to a core temperature of 80°C for 203 seconds or 70°C for 574 seconds

7.2.1 Discussion

(1) In turkeys, the anterior thoracic air sac and the paired posterior thoracic and thoraco-cervical air sacs are combined as an aggregate sac which communicates with the anteroventral portion of the lung. A large ventral diverticulum from the aggregate sac pneumatises the sternum through several foramina on its dorsal surface and a diverticulum from the dorsal surface of the aggregate sac communicates with the spine from the second cervical vertebra to the fourth coccygeal vertebra, with numerous pneumatic foramina in each thoracic and coccygeal vertebra. A dorsal extension of the aggregate sac also pneumatises the humerus. The pelvic bones are also pneumatised from the greater abdominal air sacs (Cover 1953)1.

(2) Of all the hazards identified in the IRA, freedom from respiratory tissue was presented as a risk management option component only for APMV-2 and APMV-3. The exposure assessment (Section 6.2.2) stated “Any respiratory or intestinal tissue remnants in imported turkey carcases would be unlikely to be removed prior to cooking although, in the absence of any data to support this, it is assumed that some of this may be discarded as raw tissue prior to cooking and therefore accessible to backyard poultry”. MPI recognises that some air sac tissue may remain in carcases after routine evisceration, hence the requirement that entire turkey carcases be from flocks free from APMV-2 and APMV-3 or be heat treated. However, it is reasonable to assume that there is a negligible likelihood that susceptible species will be exposed to air sac remnants associated with pneumatised bones in bone-in turkey products prior to cooking.

(3) Risk management option 1 allows turkey products free of respiratory tissue or intestine to be imported with no additional risk mitigation measures. Because of extensive nature of the respiratory system of the turkey, with abdominal air sacs and pneumatic bones, it is difficult to certify any bone-in cuts are free of respiratory tissue. The recommended clause for the IHS has been written so that it excludes cuts of turkey meat that are likely to have remnants of adherent viscera after routine evisceration such as bone-in breast that may have adherent lung tissue on the inside of the ribs and vertebrae.

(4) Specific details of surveillance systems required to establish country, zone, compartment or flock freedom shall be submitted during bilateral negotiations, as part of the production system outline and biosecurity plan (when required), and must be endorsed by the Competent Authority of the exporting country. MPI assessment will be based on the systems’ alignment with the *Code* Chapter for animal health surveillance.

(5) Cooking requirements for turkey carcasses are reflective of the *Code* recommendations for NDV. The risk analysis states these cooking time and temperature parameters could be accepted as an option to mitigate the risk of APMV-2 in poultry carcasses.

[1] **Cover MS** (1953) Gross and microscopic anatomy of the respiratory system of the turkey III. The air sacs. American Journal of Veterinary Research 14, 239-245.

7.2.2 Recommendation

(1) The turkey meat or turkey meat products must not include entire turkey carcasses or cuts of turkey that may contain remnants of adherent viscera, such as bone-in breast and leg quarter or thighs with back bone; or

(2) One of the following requirements apply:

a) The turkey meat or turkey meat products must be derived from turkeys kept in a country, zone or compartment free from APMV-2 and APMV-3 since hatching or for the 21 days before slaughter for export in accordance where surveillance demonstrates the absence of disease or infection; or

b) The turkey meat or turkey meat products must be derived from flocks demonstrated to be free from APMV-2 and APMV-3 by carrying out testing on a statistically valid randomly selected sample of within the 7 day period before slaughter with a diagnostic test listed in MPI-STD-TVTL; or

c) The turkey meat or turkey meat products have been cooked in accordance with the *Code* recommendations for inactivation of NDV in meat.

7.3 Highly pathogenic avian influenza (HPAI)

7.3.1 Options presented in the *Import Risk Analysis: Turkey Meat*

(1) Imported turkey meat could be derived from birds kept in a country, zone or compartment free from highly pathogenic avian influenza (HPAI) since they were hatched or for at least the 21 days before export. Freedom could be based on surveillance in accordance with Articles 10.4.28 to 10.4.34 of the *Code*.

(2) Meat derived from flocks where virus isolation has demonstrated freedom from H5 and H7 avian influenza viruses at slaughter could be considered eligible for import.

(3) Imported turkey meat could be cooked in accordance with Article 10.4.26 of the *Code*.

7.3.2 Discussion

(1) MPI assessed the proposed risk management options 1 and 3 for this disease to be appropriate to effectively manage the risk. Cooking requirements for the turkey meat will refer to the current requirements in the *Code*. These cooking options mitigate risk and will be adopted in the IHS.

(2) In order to remain aligned with the requirements for poultry meat in the *Code*, the option to demonstrate flock freedom by testing at slaughter has not been included in the IHS.

7.3.3 Recommendation

(1) The turkey meat or turkey meat products must be derived from turkeys kept in a country, zone or compartment free from HPAI since hatching or for the 21 days before slaughter for export, with current *Code* surveillance requirements being met to claim freedom from HPAI; or

(2) The turkey meat or turkey meat products must be cooked in accordance with the *Code* recommendations for inactivation of avian influenza virus in meat.

7.4 Turkey coronavirus (TCV)

7.4.1 Options presented in the *Import Risk Analysis: Turkey Meat*

(1) Turkey meat products that do not contain remnants of the bursa of Fabricius could be considered eligible for import.

(2) Turkey meat could be imported from countries where TCV has not been recognised.

(3) Turkey meat could be imported from a flock where testing of pooled faeces or intestinal content by RT-PCR has demonstrated no infection with TCV on the day of slaughter.

(4) Turkey meat to be imported could be cooked in accordance with the conditions required to manage the risk associated with NDV (see Section 5.3.1 of the IRA).

7.4.2 Discussion

(1) MPI assessed the proposed risk management options 1, 2, 3 and 4 for this disease to be appropriate to effectively manage the risk.

(2) MPI's expectation for option 2 is that no case of TCV has been known to occur in that country. The IHS recommended wording reflects this expectation.

(3) Cooking requirements for turkey meat reflect the current *Code* recommendations for NDV. The IRA: Turkey meat states these cooking time and temperature parameters could be accepted as an option to mitigate the risk of TCV in turkey meat and meat products. Option 4 will be adopted in the IHS for turkey meat and meat products, as a thermal treatment for the product, to manage TCV risk.

7.4.3 Recommendation

(1) The turkey meat or turkey meat products must not include entire turkey carcasses and must be free from free bursa of Fabricius tissue; or

(2) One of the following requirements apply:

a) The turkey meat or turkey meat products must be derived from birds in a country, zone or compartment where no known case of TCV has been recorded; or
b) The turkey meat or turkey meat products must be derived from flocks demonstrated to be free from TCV by testing at least 60 birds within the 7 day period before slaughter with a test listed in MPI-STD-TVTL; or
c) The turkey meat or turkey meat products have been cooked in accordance with the *Code* recommendations for inactivation of NDV in meat.

7.5 Turkey viral hepatitis virus

7.5.1 Options presented in the *Import Risk Analysis: Turkey Meat*

(1) Turkey meat products that do not contain remnants of liver, pancreas, and intestinal tract could be considered eligible for import.

(2) Imported turkey carcasses could be required to originate from flocks with no history of unusually high liver condemnations at slaughter.

7.5.2 Discussion

(1) MPI assessed the proposed risk management options 1 and 2 for this disease to be appropriate to effectively manage the risk.

(2) The scientific justification for requiring measures for TVH, not notifiable to the OIE, is provided in the body of the IRA.

(3) Since TVH is a subclinical disease and there is no serological procedure available for diagnosis, liver condemnation rates are used to determine flock freedom from TVH. In TVH affected flocks, liver condemnation at slaughter varies between 30-90% McFerran JB (1993)2. Monthly liver condemnation data from turkeys in Canada (see: http://www.agr.gc.ca/eng/industry-markets-and-trade/statistics-and-market-information/by-product-sector/poultry-and-eggs/poultry-and-egg-market-information-canadian-industry/condemnations/?id=1384971854399#turkey) from January 1999 to October 2010 shows the mean number of condemnations per 10,0000 birds at slaughter can be expected to be around 8.1, with a standard deviation of approximately 3.54. It is therefore recommended that a requirement of liver condemnation rates of less than 2% be inserted in the IHS.

[2] **McFerran JB** (1993) Turkey viral hepatitis. In: McFerran J B, McNulty M S (eds) *Virus Infections of Birds.* Pp 515-7. Elsevier, Amsterdam.

(4) TVH survives exposure to temperatures of 60°C for 6 hours or 56°C for 14 hours so domestic cooking is not considered likely to inactivate this agent.

7.5.3 Recommendation

(1) The turkey meat or turkey meat products must not include entire turkey carcasses, and must be free from liver, pancreatic and intestinal tissue; or

(2) The turkey meat or turkey meat products must be derived from birds slaughtered in a Competent Authority approved abattoir with documented evidence that demonstrates liver condemnation rates are less than 2%.

7.6 Salmonella arizonae

7.6.1 Options presented in the *Import Risk Analysis: Turkey Meat*

(1) Imported turkey meat could be derived from birds in a country, zone, or compartment free from *S. arizonae*.

(2) Imported turkey meat could be derived from breeding flocks, hatcheries, and rearing farms that have been shown to be free from *S. arizonae* in accordance with the guidelines in Chapters 6.4 and 6.5 of the *Code*.

(3) Imported turkey meat could be cooked to reach a core temperature of 79°C.

7.6.2 Discussion

(1) MPI assessed the proposed risk management options 1, 2, and 3 for this disease to be appropriate to effectively manage the risk.

(2) The scientific justification for requiring measures for *S. arizonae*, not notifiable to the OIE, is provided in the body of the IRA.

(3) MPI approved surveillance requirements will be based on the *Code* Chapter 1.4. Specific details of surveillance systems required to establish country or zone freedom will be approved during bilateral negotiations with potential trading partners.

(4) For *S. arizonae*, *Code* Chapter 6.4: Biosecurity in poultry production and Chapter 6.5: Prevention, detection and control of Salmonella in poultry provide the recommendations which will meet MPI's requirements for breeding flock, hatchery and rearing farm freedom from *S. arizonae*. Specific details of surveillance systems required to establish compartment or breeding flocks/hatcheries/rearing farms freedom shall be submitted as part of the production system outline +/- biosecurity plan, and must be endorsed by the Competent Authority of the exporting country, and subsequently assessed for approval by an MPI CTO.

(5) For exported product produced in systems that may not be aligned with the *Code* requirements, a specific flock testing option aligned with sampling requirements for other risk organisms is included.

(6) The requirement to cook to a core temperature of 79°C was based on the publication of Schnepf and Barbeau (1989)3. This study demonstrated that cooking contaminated chickens (using a conventional oven or convection microwave oven) to a core temperature of 79°C was sufficient to eliminate Salmonella whereas viable organisms were recovered when the core temperature was reduced to 77°C.

(7) The USDA FSIS standard is based on the findings of Juneja et al (2001)4 who estimated (based on extrapolation from studies performed over a temperature range of 58°C to 65°C) that exposure of turkey meat to 74°C for around 9 seconds would be required to ensure a 7 log reduction in Salmonella. MPI has reviewed the findings of Juneja et al (2001) and agrees that the non-linear survival curves generated by their modelling (which form the basis of the USDA FSIS standard) are

[3] **Schnepf M and Barbeau (1989)** Survival of *Salmonella Typhimurium* in roasting chickens cooked in a microwave, convection microwave and a conventional electric oven. *Journal of Food Safety* 9, 245-252.
[4] **Juneja VK, Eblen BS and Marks HM (2001)** Modeling non-linear survival curves to calculate thermal inactivation of Salmonella in poultry of different fat levels. *International Journal of Food Microbiology* 70, 37-51.

appropriate to specify the time/temperature requirements to manage the risk of *Salmonella arizonae* in turkey meat. Based on these results, the following conditions (which will achieve a 7 Log reduction in Salmonella in turkey meat with 12% fat) will be included in the IHS:

a) 60°C for 2030 seconds; or
b) 62°C for 1073 seconds; or
c) 65°C for 370 seconds; or
d) 70°C for 41 seconds; or
e) 72°C for 19 seconds; or
f) 74°C for 9 seconds; or
g) 76°C for 4 seconds; or
h) 79°C for 1 second.

7.6.3 Recommendation

(1) The turkey meat or turkey meat products must be derived from flocks kept in a country, zone or compartment free from *Salmonella arizonae* as demonstrated by surveillance, conducted in accordance with the *Code* Chapter for Prevention, detection and control of Salmonella in poultry; or

(2) The turkey meat or turkey meat products must be derived from breeding flocks, hatcheries, and rearing farms free from *Salmonella arizonae*, as demonstrated by surveillance conducted in accordance with the *Code* Chapter for Prevention, detection and control of Salmonella in poultry; or

(3) The turkey meat or turkey meat products must be derived from flocks demonstrated to be free from *Salmonella arizonae* by testing at least 60 birds within the 7 day period before slaughter with either:

a) *Salmonella* culture on samples of pooled faeces or intestinal content; or
b) A test listed in MPI STD-TVTL; or

(4) The turkey meat or turkey meat products must be cooked and reach a core temperature of one of the following time and temperature parameters:

a) 60°C for 2030 seconds;
b) 62°C for 1073 seconds;
c) 65°C for 370 seconds;
d) 70°C for 41 seconds;
e) 72°C for 19 seconds;
f) 74°C for 9 seconds;
g) 76°C for 4 seconds;
h) 79°C for 1 second.